Victorian Environmental Assessment Council

Assessment of the values of state forests in the Central Highlands

Interim report

December 2023

Victorian Environmental Assessment Council

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

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Acknowledgement of Aboriginal Victorians

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices. We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.

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Cover image

Mountain ash forest in the Yarra Ranges, provided by Tourism Victoria

At a glance

Key messages

- The state forests of the Central Highlands region are on the Country of the Wurundjeri, Taungurung, Bunurong and Gunaikurnai peoples.
- In the context of the Victorian government's announcement that native timber harvesting in Victoria's state forests will cease by 1 January 2024, VEAC is assessing the values of the state forests in the Central Highlands Regional Forest Agreement area. This interim report is the first assessment required in the terms of reference.
- The tall wet ash forests of the Central Highlands have very high values for nature conservation, cultural heritage, water production, carbon storage, recreation and tourism, science, and many other uses.
- There was insufficient time for biocultural assessments or statements of Aboriginal cultural heritage values, rights and interests prepared by some Traditional Owners of the land to be included in this report. These will be published as and when available and incorporated as agreed with Traditional Owners in VEAC's final report in mid 2024.
- The forest values are under threat particularly from the impacts of climate change including more extreme weather events such as heatwaves and floods, higher average annual temperatures, declines in annual rainfall, and increased bushfire frequency and severity. Growth in the population of nearby metropolitan Melbourne places increasing pressure on the forests for recreation and other uses.
- Multiple threats to biodiversity, accelerating risks and often limited management resources mean that there is considerable uncertainty about the most effective actions for reducing threats.
- This interim report will provide a basis for community consultation in 2024 to be conducted by the Eminent Panel for Community Engagement (EPCE) who will provide recommendations to the government on the future use of the state forests.

Land use categories commensurate with the values

VEAC has identified large areas of high natural values with relatively low conflicting uses that could be protected in a public land category such as national park, and that link the existing national parks in the region.

In areas with both high natural values and high values for uses that could conflict with national park status, further information is needed, and these areas should be a focus for the community engagement being undertaken by the EPCE.

In the remaining areas, more detailed and localised information about environmental and social values elicited from community engagement will assist in determining appropriate public land use categories.

Executive summary

The state forests of the Central Highlands Regional Forest Agreement (RFA) area are on the Country of the Bunurong, Gunaikurnai, Taungurung and Wurundjeri peoples. The Victorian Environmental Assessment Council (VEAC) is committed to partnering and engaging with Victoria's Traditional Owners and Aboriginal communities to enable self-determination, and to support the protection of Country and the maintenance of spiritual and cultural practices.

Located on Melbourne's doorstep, the tall wet ash forests of the Central Highlands are spectacular and distinctive landscapes, supporting the world's tallest flowering plants. The towering forests with their tree fern understorey are recognised nationally and internationally, providing critical habitat for many elements of biodiversity, including threatened species such as Victoria's faunal emblem Leadbeater's possum and the southern greater glider. The assessment area also includes significant areas of alpine and mixed species forests.

The Central Highlands forests also have very high values as the source of Melbourne's water, and for carbon storage, recreation and, until the present, timber production. The forests face significant threats from climate change, including more extreme weather events such as heatwaves and floods, higher average annual temperatures, declines in annual rainfall, and increased bushfire frequency and severity. Population growth in nearby Melbourne with inevitable increases in visitation will also place pressure on these areas.

Many different regional and urban communities have a stake in the future of these forests. Much of this forest area has been logged and contains substantial areas impacted by previous activity and frequent fire. Restoration and management to build ecological resilience in the face of climate change will be key. Perspectives vary and there are strongly held and sometimes contested views about environmental and social values of the forests and how they should be managed. Determining the future of the Central Highlands forests will benefit from the passionate interest and involvement of individuals, organisations and local communities, especially Traditional Owners. Decades of scientific research and monitoring in these forests also provide a sound basis for future management.

Forests announcements

In November 2019 the Victorian government announced that timber harvesting would end in Victoria's native forests by 2030. Alongside this announcement the Victorian government announced the cessation of commercial timber harvesting in 96,000 hectares of state forest in Immediate Protection Areas (IPAs).

In May 2023 the Victorian government announced that the cessation of native timber harvesting on public land would be brought forward to 1 January 2024. As part of the announcement the government said it would establish an advisory panel to consider areas of the forests that qualify for protection as national parks, the areas that would be suitable for recreation opportunities and opportunities for management of public land by Traditional Owners. Government is still considering the make-up and constitution of this panel.

While this process is being finalised, VEAC will continue work already started in the Central Highlands. This assessment of the Central Highlands is the second phase of forest assessments that began in 2021 when the government announced that VEAC will undertake scientific assessments of the IPAs and an Eminent Panel for Community Engagement (EPCE) will undertake community engagement and provide recommendations to government on the future uses of State forest. The Phase 1 assessment covering IPAs in the Strathbogie Ranges and near Mirboo North was completed in July 2022.

This report

In March 2023, VEAC was requested by the Minister for Environment to assess the values of the IPAs in the Central Highlands and East Gippsland, and in adjacent state forests.

Following the announcement by the Victorian government in May 2023 that native timber harvesting in Victoria's state forests will now end by 1 January 2024, the terms of reference were amended and VEAC shifted its focus to all state forests in the Central Highlands.

VEAC is required to publish an interim assessment of the values of the area in December 2023 (this report), addressing four of the five topics in the terms of reference, with a final full assessment to be submitted to the Minister for Environment by 31 July 2024. The final report will include VEAC's economic assessment of the proposed land use changes recommended by the EPCE.

In previous investigations and assessments, VEAC has undertaken community consultation and received written submissions. For this assessment, VEAC's interim report will instead inform the community engagement to be undertaken by the EPCE.

Terms of reference and scope of this report

The assessment is published to inform the work of the EPCE in its provision of advice and recommendations to the Minister for Environment on the future uses of the State forest in the Central Highlands Regional Forest Agreement (RFA) area.

The purpose of the assessment specified in the terms of reference is to:

- **a.** identify the biodiversity, ecological, geological and geomorphological values of the specified area
- **b.** identify the cultural heritage, social and economic values of the specified area
- **c.** identify the current and likely future threats to those values, including climate change
- **d.** identify the typical land use categories commensurate with the identified values
- **e.** assess the potential economic implications of proposed land use changes recommended by the Panel and provided to the Council.

This interim report addresses topics (a) to (d) of the terms of reference for the Central Highlands RFA area. VEAC will address topic (e) of the terms of reference for in its final report to the Minister by 31 July 2024.

VEAC's approach to the assessment

This report is based largely on desktop assessment of environmental, cultural heritage, social and economic values and threats and some discussions framed around data and knowledge with land and resources managers, and scientists.

Information was sourced from participants in those discussions, as well as from government datasets, published reports, peer-reviewed journal papers, external publicly available datasets, and information and reports from community groups and forest users where available.

Additional detailed information was commissioned or provided on biodiversity, geology and geomorphology, water supply and catchments, recreational hunting, and minerals and extractives potential.

Central Highlands RFA area

The Central Highlands RFA area is located north and east of Melbourne and includes the townships of Alexandra, Eildon, Erica, Healesville, Marysville, Noojee, Warburton, Yarra Junction and numerous other towns, as well as the north east fringe of metropolitan Melbourne.

There are 616,970 hectares of public land of which 389,725 hectares (63 per cent) is state forest. National and state parks make up 165,747 hectares (27 per cent) including the Dandenong Ranges, Kinglake, Lake Eildon, Mount Baw Baw and Yarra Ranges national parks, and the Bunyip, Cathedral Range, Moondarra and Warrandyte state parks.

The Highlands-Southern Fall (47 per cent) and Highlands-Northern Fall (23 per cent) are the dominant bioregions in the RFA area. They contain the majority of the region's cool temperate rainforest and the characteristic tall wet forests of mountain and alpine ash and shining gum, as well as substantial areas of mixed species forests. The Central Victorian Uplands (14 per cent) and the Victorian Alps (eight per cent) bioregions also account for sizeable parts of the RFA area. The Central Victorian Uplands comprise the drier northern foothills of the dividing range with only nine per cent of the occurrence in the RFA area on public land. In contrast, almost all of the Victorian Alps bioregion in the RFA area is on public land, covering the higher peaks and plateaus in the east.

Previous major investigations and assessments of public land of relevance to the state forests within the Central Highlands RFA area include:

- Melbourne District 2 Review (LCC, 1994)
- Conservation Values of State Forests (VEAC, 2017)
- Central Highlands Regional Forest Agreement Comprehensive Regional Assessment (Commonwealth of Australia, 1997) and Further Assessment of Matters (State of Victoria and Commonwealth of Australia, 2019).

Summary of values

Values, rights and interests of Traditional Owners

There has been insufficient time for biocultural assessments or statements of Aboriginal cultural heritage values, rights and interests prepared by some Traditional Owners of the land to be included in this interim report. These will be published on VEAC's website as and when available and incorporated as agreed with Traditional Owners in VEAC's final report to the Minister in mid-2024.

Biodiversity, ecological, geological and geomorphological values

The history of land use in the state forests has affected the condition of the forests through the impacts of logging, fires, and weeds and pests. Nonetheless the forests of the Central Highlands RFA area have significant natural values:

- The parks and state forests of the Central Highlands region are the stronghold of the mountain ash (*Eucalyptus regnans*) forest community, with only a few small pockets remaining elsewhere in Victoria and in Tasmania. Mountain ash is the world's tallest flowering plant.
- Almost 400 threatened plant and animal species have been recorded from the Central Highlands RFA area. Forest-dependent threatened species include Leadbeater's possum, sooty owl, Baw Baw frog and southern greater glider, as well as several aquatic plants and animals found in the forested waterways.
- 17 of the 152 Ecological Vegetation Classes (EVCs) across the RFA area are priorities for addition to the protected area system. EVCs are ecosystem surrogates in addressing the national and state targets for comprehensiveness, adequacy and representativeness. Of the 17 EVCs, three are Cool Temperate Rainforest occurring in the Victorian Alps, Highlands – Southern Fall and Highlands – Northern Fall bioregions.
- More than 200 geological and geomorphological sites of significance were identified with 13 assessed as having high significance (one international, one national and 11 state significance).
- The Central Highlands, and the ash forests in particular, are a significant source of freshwater for Victoria, containing the headwaters of many important rivers such as the Yarra, Latrobe, Thomson and Goulburn rivers. The water catchments of the area contribute much of greater Melbourne's high quality drinking water.
- One of the ecosystem services provided by native forests is a stock of carbon stored in natural, self regenerating ecosystems. The mountain ash forests of the Central Highlands are amongst those containing the highest density of carbon in the world.

Cultural heritage, social and economic values

- The state forests of the Central Highlands RFA area have a wealth of non-Aboriginal heritage values (historic sites) that reflect the region's post-contact history and provide valuable insights into past activities. There are 145 registered historic sites recorded within the Central Highlands state forests, mainly associated with the forestry and timber industry and mining and mineral processing, including 12 on the Victorian Heritage Register.
- While the government has announced that timber harvesting will cease on 1 January 2024, timber resources have been an important economic value of the forests. Wood products extracted from state forests over the last 170 years include hardwood sawlog and pulpwood, commercial firewood, domestic firewood and minor forest produce such as seeds. Harvesting of wood products has been concentrated in the higher value ash forests (predominantly mountain and alpine ash) particularly from the 1980s.
- Current resource uses and other licensed uses include six mining licences for gold mines, not all of which are currently active, seven current Extractive Industry Work Authorities, 186 apiary sites mostly located in the forests on the north side of the Great Dividing Range in the Goulburn River basin, and 135 licences and leases for a range of uses, including grazing.
- There is significant potential for gold in the state forests in the east of Central Highlands RFA area. Geological Survey Victoria (GSV) has assessed the Upper Goulburn State Forest area as having the highest potential for gold and critical minerals. GSV also found

that areas near Erica and east of Warburton in particular, exhibit very high potential for critical minerals (including copper, nickel, tin, tungsten, antimony, zinc, rare earth elements, platinum group elements and cobalt), gold and extractives (including limestone and sedimentary hard rock).

- Recreational use of the forests include activities such as camping, fishing and water-based activities, four-wheel driving, mountain biking, horse riding, trailbike riding, bushwalking, birdwatching, recreational prospecting, deer hunting and scenic driving. State forests in the west of the Central Highlands RFA area are within a one-hour drive of Melbourne's eastern suburbs making them popular for day trips. In the east of the RFA area, the lower number of visitors makes these forests ideal for those seeking a more remote nature experience such as dispersed camping, hunting trips and more challenging hikes and four-wheel driving experiences.
- Local residents use the forests for wellbeing, health and social values associated with access to and connection with natural areas. Community values include the value placed on the continued existence of forests for future generations, and more specific values such as large old trees in the landscape.
- There are many different worldviews and knowledge systems that influence the ways people interact with and value nature, particularly non-market values. Diverse values include the value for scientific research, particularly where there are long-term sites that have been monitored for several decades as in the Central Highlands state forests.

Summary of current and likely future threats

Multiple threats to biodiversity and to social, cultural and economic values, accelerating risks and often limited management resources mean that there is considerable uncertainty about the most effective actions for reducing threats. Threats and threatening processes include:

- Climate change: changes in fire frequency and severity, a hotter and drier climate, and more extreme weather events. Climate change acts as a risk accelerator, potentially multiplying the impacts of other threats
- Invasive plant and animal species (such as blackberry and deer)
- Changed fire regimes, such as increased fire frequency and intensity
- Loss and fragmentation of habitat putting greater pressure on remaining habitat
- Growing population in metropolitan Melbourne leading to more recreational/human use pressures.

Typical public land categories commensurate with the identified values

An overview of Victoria's public land categories is provided in chapter 5 of this report. VEAC has identified six broad tracts of state forest, each with a combination of environmental values and potentially conflicting uses (see figure 5.2 reproduced below).

VEAC has been requested to identify typical land use categories commensurate with the identified values, and is using currently recognised categories. The Council acknowledges that some Traditional Owners have different approaches to managing public land, and that the current public land legislation reforms may consider these. VEAC supports these discussions continuing, including through the processes of the EPCE as it prepares its final report, to build a shared understanding on options for the management, planning and governance arrangements for public land, while the landmark legislation reforms are finalised.

A large protected area such as a national park is commensurate with the outstanding natural values of three large areas in the north and south of the RFA area (units 1, 3 and 4 in figure 5.2) and would

link the existing Yarra Ranges, Kinglake, Lake Eildon and Baw Baw national parks and the Bunyip, Cathedral Range and Moondarra state parks. There are relatively few uses that would conflict with the national park designation, although this is an area that the EPCE should explore further with the community during its engagement period. This area encompasses the full range of major forest types and landscapes of the Central Highlands including the wet montane ash forests and rainforests that characterise the region.

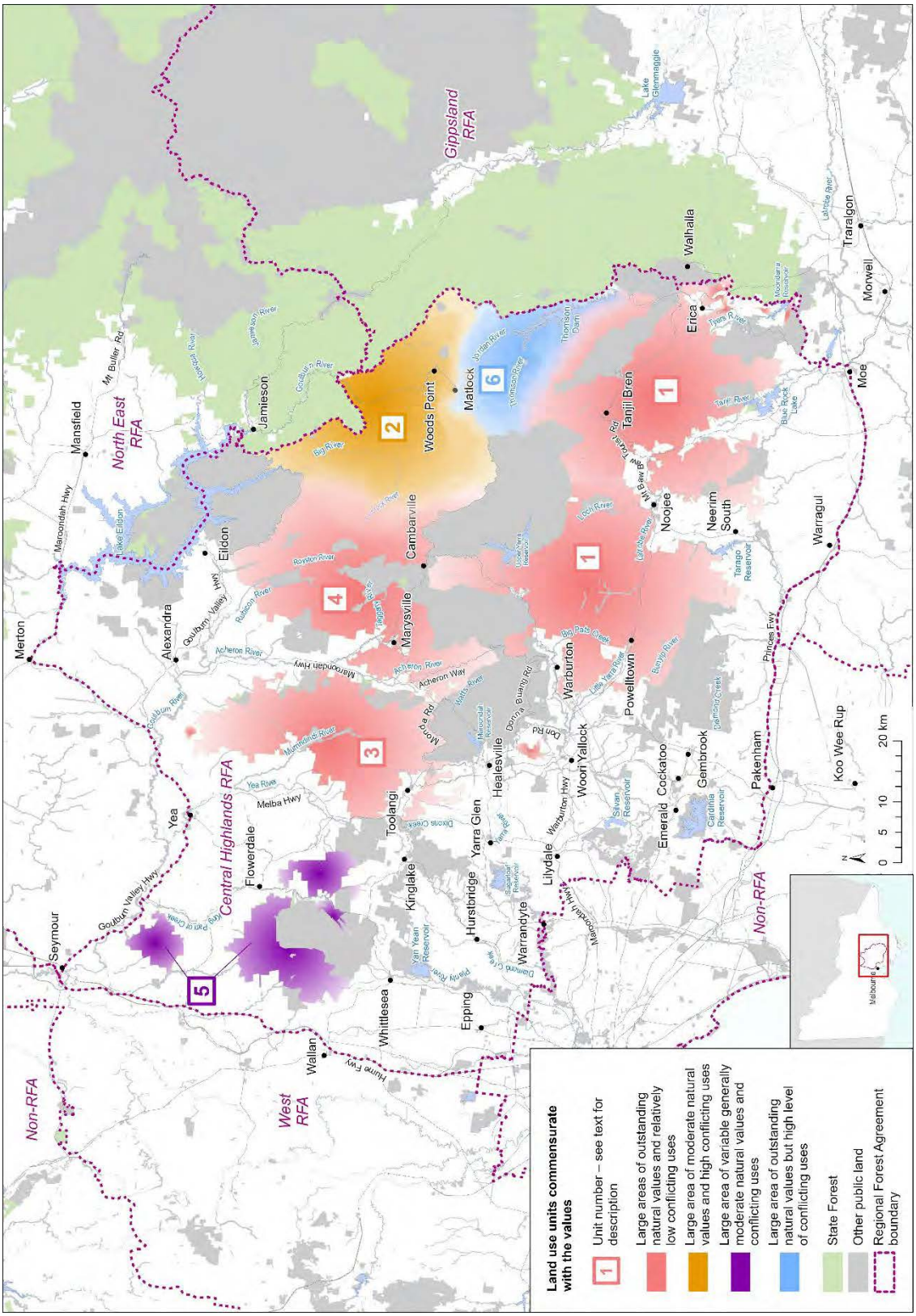
Unit 6 covering the upper Thomson catchment also contains outstanding natural values commensurate with a national park designation, and would link the area to the Yarra Ranges National Park to the west. More detailed consideration is needed however as there are potentially high values for uses, such as mineral extraction, that would conflict with such a designation.

A second large area in the northeast of the Central Highlands RFA area (unit 2) has moderate natural values and, while it could provide an opportunity to link the Yarra Ranges and Lake Eildon national parks, has a high level of uses not generally compatible with national park status such as hunting, and potentially high values for incompatible uses such as minerals extraction. A public land category such as forest park or regional park would be commensurate with the values and allow for these uses.

For state forests in the west of the area north of the Kinglake National Park (unit 5), there are several public land categories commensurate with the broadly less significant natural values and fewer uses that would conflict with protected area designations. More detailed information at a finer scale, including information from community engagement, is required for this unit.

After tens of thousands of years of being cared for by Traditional Owners, the Central Highlands forests have been significantly impacted since colonisation by activities like logging and land clearing. They now face the accelerating, uncertain impacts of climate change, with fire frequency and intensity likely to be critical to shaping future ecosystems and values. For all public land categories, sufficient management resources are required for active and adaptive management to restore and maintain values and build resilient healthy forests.

Figure 5.2 Suggested land use groupings commensurate with the values of the Central Highlands state forests



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Abbreviations and acronyms

ARI	Arthur Rylah Institute for Environmental Research
asl	above sea level
the Biodiversity Plan	*Protecting Victoria's Environment – Biodiversity 2037*
BLCAC	Bunurong Land Council Aboriginal Corporation
CAR	Comprehensive, adequate and representative protected area system
CFA	Country Fire Authority
CHL	Commonwealth Heritage List
CMA	Catchment Management Authority
CRA	Comprehensive Regional Assessment
DEECA	Department of Energy, Environment and Climate Action
DELWP	Department of Environment, Land, Water and Planning
DWSC	Designated Water Supply Catchment
ECC	Environment Conservation Council
EIIA	Extractive industry Interest Area
EMV	Emergency Management Victoria
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPCE	Eminent Panel for Community Engagement
EVC	Ecological Vegetation Class
FFG Act	*Flora and Fauna Guarantee Act 1988*
FFMVic	Forest Fire Management Victoria
GLaWAC	Gunaikurnai Land and Waters Aboriginal Corporation
GPS	Global Positional System
GSA	Geological Society of Australia
GSV	Geological Survey of Victoria
Heritage Act	*Heritage Act 2017* (Victoria)
historic sites	non-Aboriginal heritage values
HSF	Highlands – Southern Fall bioregion
IPA	Immediate Protection Area
IPBES	Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for Conservation of Nature
LCC	Land Conservation Council
NLH	National Heritage List
NRS	National Reserve System
NRSMPA	National Representative System of Marine Protected Areas
the Panel	Eminent Panel for Community Engagement
RAP	Registered Aboriginal Party
RFA	Regional Forest Agreement
TLaWC	Taungurung Land an Waters Council
TSCRA	Threatened Species and Communities Risk Assessments
VAGO	Victorian Auditor-General's Office
VEAC	Victorian Environmental Assessment Council
VEAC Act	*Victorian Environmental Assessment Council Act 2001*
VFP	Victorian Forestry Plan
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
VIF2023	Victoria in Future 2023
WHL	World Heritage List
WWWCHAC	Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation

1. Introduction

This report is an assessment of the values of state forests in the Central Highlands of Victoria, including the areas identified as Immediate Protection Areas (IPAs) in November 2019 (see figure 1.1). The boundary of the Central Highlands for the purposes of this assessment is the Regional Forest Agreement (RFA) area (see figure 1.3).

In March 2023 the Victorian Environmental Assessment Council (VEAC) was requested by the Minister for Environment Ingrid Stitt MP to assess the values of the IPAs in the Central Highlands and East Gippsland, and in adjacent state forests in eastern Victoria. This request was amended in September 2023. The revised terms of reference limit assessment to the Central Highlands with scope for VEAC to consider adjacent areas of state forest (see box 1.1). VEAC is required to publish an interim assessment of the values of the area in December 2023 (this report), addressing four of the five topics in the terms of reference, with a final full assessment to be submitted to the Minister for Environment by 31 July 2024.

This report is based largely on desktop assessment of environmental, cultural heritage, social and economic values and threats and some discussions framed around data and knowledge with land and resources managers, scientists and stakeholders. Section 1.6 provides details of additional work commissioned for this report. There has been insufficient time for Traditional Owners of the land to complete biocultural assessments or statements of Aboriginal cultural heritage values, rights and interests for inclusion in this report. These will be incorporated into VEAC's final assessment when available and as agreed with Traditional Owners.

VEAC is not undertaking community consultation or receiving submissions on this assessment. This report has been prepared as a major contribution to the community engagement to be undertaken by the Eminent Panel for Community Engagement (EPCE). Further information on the community's values will be gathered from the EPCE's consultation and will be incorporated in VEAC's final assessment and in the EPCE's own report. See the following sections 1.1 to 1.5 for details of the process for community engagement on the information in this report.

1.1 Background to the assessment

Native forests announcements in 2019

In November 2019 the Victorian government announced that timber harvesting would end in Victoria's native forests by 2030. The Victorian Forestry Plan (VFP) was developed to assist the industry as it managed its gradual transition away from native forest harvesting.[1]

Alongside this announcement the Victorian government announced environmental protections including cessation of commercial timber harvesting in 96,000 hectares of state forest in Immediate Protection Areas (IPAs). The IPAs supported the protection of critical habitat for more than 35 forest-dependent species, including the greater glider (*Petauroides volans*) and Leadbeater's possum (*Gymnobelideus leadbeateri*). The greater glider Action Statement, released with the announcement of the VFP, outlined conservation measures for the greater glider, listed as threatened in 2017, and included an indicative map of the IPAs.[2] The IPAs are located in the Strathbogie Ranges, Central Highlands, East Gippsland and near Mirboo North (see figure 1.1).

At the time of the VFP announcement, the Victorian government made a commitment to a community engagement process to determine the permanent protection and reservation of the IPAs.

1 djpr.vic.gov.au/__data/assets/pdf_file/0012/2042040/13318-VIC-Forestry-Plan_V2_FA_WEB.pdf

2 environment.vic.gov.au/__data/assets/pdf_file/0019/440371/267-Greater-Glider-2019-Action-Statement.pdf

Assessment of IPAs phase 1 (2021–2022)

In August 2021 the Victorian government announced that VEAC would undertake a scientific assessment of environmental, biodiversity and other values in areas identified as IPAs, and that the assessment would be made available to the public and would provide advice on appropriate land tenure for the IPAs. The government also announced that community consultation would be undertaken by an Eminent Panel for Community Engagement on the future uses of State forest in eastern Victoria (the panel) to be chaired by Karen Cain and including the formal representation of VEAC.[3]

The panel was formally established by the Minister for Energy, Environment and Climate Change in January 2022.[4] Representatives of the Registered Aboriginal Parties (Traditional Owners) for the relevant Country were also appointed to the panel as sessional members during the engagement process for each IPA on their Country. More information about the panel is available at delwp.vic.gov.au/futureforests/immediate-protection-areas/eminent-panel-for-community-engagement.

The assessment of the IPAs is being delivered in two phases:

- phase 1 – IPAs in Mirboo North and Strathbogie Ranges
- phase 2 – IPAs in Central Highlands and East Gippsland and future use and management of state forests in eastern Victoria.

For the phase 1 assessment, separate reports were published in March 2022 for the Mirboo North and Strathbogie Ranges IPAs. These informed the community consultation undertaken by the panel for the two areas from April to June 2022. The assessment reports included the direct input from the Traditional Owners of the Country that included the IPAs, and VEAC's advice on the typical land use categories commensurate with the identified values.

VEAC provided its completed assessment, including an economic assessment of the panel's recommendations, to the Minister on 31 July 2022. The reports for the IPAs in phase 1 are available on VEAC's website. The panel's report to the Minister was released in August 2022, with its recommendations on the future uses of the Mirboo North and Strathbogie Ranges IPAs and two engagement reports. It is available at delwp.vic.gov.au/futureforests/immediate-protection-areas.

Announcement of an end to native forest logging in Victoria

In May 2023 the Victorian government announced a revised timeline for Victoria's native timber transition.[5] Native timber harvesting in Victoria's state forests will now end by 1 January 2024, with existing supports for businesses, workers and communities being brought forward and scaled up.

The Victorian government also announced that it will establish an advisory panel to consider and make recommendations to government on the areas of forests that qualify for protection as national parks, the areas of forests that would be suitable for recreation opportunities – including camping, hunting, hiking, mountain biking and four-wheel driving – and opportunities for management of public land by Traditional Owners. Further details about these arrangements are not yet available.

3 Media release lilydambrosio.com.au/media-releases/protecting-victorias-forests-and-threatened-species/. VEAC is represented by Chairperson Mellissa Wood.

4 premier.vic.gov.au/next-steps-guide-future-our-protected-forests

5 Media release Delivering Certainty For Timber Workers Premier of Victoria

1.2 Terms of reference

Box 1.1 Terms of reference

Pursuant to section 26B of the *Victorian Environmental Assessment Council Act 2001*, the Minister for Environment hereby requests the Victorian Environmental Assessment Council (the Council) to carry out an assessment of the values of the Immediate Protection Areas[1] in the Central Highlands, and in adjacent state forests in eastern Victoria[2] as determined by the Council. The Immediate Protection Areas and state forest in eastern Victoria are shown on the accompanying map.

The assessment will inform the work of the Eminent Panel for Community Engagement (the Panel) in its provision of advice and recommendations to the Minister for Environment on the future uses of the Immediate Protection Areas and adjacent state forest in eastern Victoria.

The purpose of the assessment is to:

(a) identify the biodiversity, ecological and geological and geomorphological values of the specified area

(b) identify the cultural heritage, social and economic values of the specified area

(c) identify the current and likely future threats to those values, including climate change

(d) identify the typical land use categories commensurate with the identified values

(e) assess the potential economic implications of proposed land use changes recommended by the Panel and provided to the Council.

This assessment will build upon the Council's *Conservation values of state forests – Assessment report* (2017) by providing a more localised assessment of these areas.

The Council is required to consider the values referred to above at the relevant state, regional and local levels, including their occurrence in existing protected areas and on other public land.

This request is for an assessment and report on the above values. Public consultation and recommendations are not required.

The Council will engage with the Panel regarding the content of the Council's assessment.

The Council must publish its assessment of the matters specified in paragraphs (a) to (d) above by 15 December 2023* and submit a report on the completed assessment by 31 July 2024*.

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1. For the purposes of this assessment, IPAs are defined as the areas announced as part of the Victorian Forestry Plan in November 2019 and updated on 21 November 2019.
2. For the purposes of this assessment, state forest in eastern Victoria is defined as state forest areas east of the Hume Highway. State forest is defined as the areas of public land depicted as General Management Zone, Special Management Zone and Special Protection Zone in the maps accompanying the Regional Forest Agreements as updated from time to time and expressed in the DEECA forest zoning data set (FMZ 100) as at the time of commencement of the assessment. State forest also includes state forest that is a natural catchment area under the *Heritage Rivers Act 1992*, an 'Other area with remote and natural attributes' recommended by the former Land Conservation Council in its *Wilderness Special Investigation Final Recommendations* (1991) and a reference area under the *Reference Areas Act 1978*.

* amended dates

Figure 1.1 Map accompanying the terms of reference: Immediate Protection Areas

Scope of this assessment

The revised terms of reference requests VEAC to assess the values of the IPAs in the Central Highlands and in adjacent state forests in eastern Victoria as determined by the Council, threats to those values, and typical land use categories commensurate with the values. Given that native timber harvesting in Victoria's state forests will now end by 1 January 2024, the Council has determined to reduce the emphasis on IPAs and assess all state forests in the Central Highlands RFA area.

1.3 About VEAC

VEAC provides the Victorian government with independent and strategic advice on matters related to the protection and management of the environment and natural resources of public land. VEAC was established under the *Victorian Environmental Assessment Council Act 2001.* VEAC is a successor organisation to the Land Conservation Council (LCC), established in 1971, and the Environment Conservation Council (ECC), which replaced the LCC in 1997.

VEAC carries out its investigations and assessments and provides advice at the request of the Minister for Environment. Together, the Act and terms of reference provided by the Minister describe how an investigation or assessment must be conducted, including the number of reports to be prepared, matters to be taken into account, timeframes and public consultation.

Public land is defined in the VEAC Act and includes Crown land and land owned by state government public authorities. It excludes private freehold land, land owned by local councils and Commonwealth land.

The VEAC Act was amended in 2016 to allow the Minister to request the Council to conduct an assessment or to provide advice in relation to a matter that, in the opinion of the Minister, does not require an investigation, having regard to the matter's limited scale or scope or its technical nature. Assessments do not require formal public consultation unless specified by the Minister in the terms of reference.

This assessment of the Immediate Protection Areas in the Central Highlands and adjacent state forest was requested pursuant to section 26B of the VEAC Act.

The current five members appointed to VEAC are Mellissa Wood (Chairperson), Dave Kendal, Nicola Ward, Nick Wimbush and Jennifer Wolcott. Brief biographies of the current Council members can be found on VEAC's website at veac.vic.gov.au. The Council is supported by a small research and policy team and an administrative secretariat.

1.4 Role of VEAC's assessment in determining the future uses of state forest in the Central Highlands

In May 2023 the Victorian government announced the bringing forward of the cessation of native timber harvesting to 1 January 2024. It said it would establish an advisory panel to consider areas of the forests that qualify for protection as national parks, the areas that would be suitable for recreation opportunities and opportunities for management of public land by Traditional Owners. Government is still considering the make-up and constitution of this panel.

While this process is finalised, VEAC is continuing its assessment work of the Central Highlands. The Central Highlands assessment is the second phase of forest assessments that began in 2021 when the government announced that VEAC will undertake scientific assessment of the IPAs and community consultation will be undertaken by the EPCE. The EPCE provides recommendations to government on the future uses of state forest.

VEAC is not required to undertake community consultation for this assessment.

This report addresses topics (a) to (d) of the terms of reference (see box 1.1) for state forests in the Central Highlands, including areas identified as IPAs, through identification of the values, threats to the values and typical land use categories commensurate with the identified values.

VEAC will address topic (e) of the terms of reference for the Central Highlands state forests in its final report to the Minister on 31 July 2024.

The process for this assessment will be undertaken in accordance with the VEAC Act and the terms of reference for the assessment. The process and timelines are shown in table 1.1.

Table 1.1 Assessment process and timelines

Phase	Timing	Activity
Preliminary	November 2019	Victorian government announces cessation of logging in native forests by 2030 and establishes Immediate Protection Areas (IPAs)
	August 2021	Minister announces process for assessment and advice on permanent protection of IPAs in eastern Victorian forests
	January 2022	Eminent Panel for Community Engagement (the Panel) established
Phase 1	November 2021	Minister provides terms of reference to VEAC for assessment of the values of Mirboo North and Strathbogie Ranges IPAs
	31 March 2022	VEAC publishes assessments of Mirboo North and Strathbogie Ranges IPAs for the matters specified in paragraphs (a) to (d) in terms of reference
	April – June 2022	The Panel conducts community engagement informed by VEAC's assessments
	June 2022	The Panel provides proposed land use changes to VEAC
	June – July 2022	VEAC assesses the potential economic implications of the Panel's proposed land use changes as specified in (e) in terms of reference
	31 July 2022	VEAC submits full report to Minister addressing (a) to (e) in terms of reference
	8 August 2022	The Panel submits Final Report to the Minister
Phase 2	20 March 2023	Terms of reference provided to VEAC for assessment of the values of IPAs and adjacent state forest in Central Highlands and East Gippsland and future use and management of State forests in eastern Victoria
	23 May 2023	State Government announced an end to native forest logging in Victoria on 1 January 2024
	11 September 2023	Minister amends terms of reference to focus on Central Highlands and extend dates for assessment reports
	19 December 2023	VEAC publishes interim assessment of Central Highlands forests addressing (a) to (d) in terms of reference (this report)
	December 2023 – April 2024	The Panel conducts community engagement informed by VEAC's assessment
	tbc	The Panel provides proposed land use changes to VEAC
	tbc	VEAC assesses the potential economic implications of the Panel's proposed land use changes as specified in (e) in terms of reference
	30 June 2024	The Panel submits final report to the Minister
	31 July 2024	VEAC submits final report to Minister addressing (a) to (e) in terms of reference

1.5 Working with Traditional Owners

Australia's First Peoples have built knowledge and understanding of Australian landscapes and ecology and their management, including through climatic changes, for over 65,000 years. This knowledge is embedded into cultural practice ensuring an obligation for caring for Country and a deep spiritual connection to Country.

Recognising this, VEAC is committed to partner and meaningfully engage with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations for self-determination.

In parallel with this VEAC assessment, some Victorian Traditional Owners are undertaking significant biocultural assessments for cultural land management in the Central Highlands region.

VEAC has begun work with Taungurung Land & Water Council (TLaWC), to explore and connect western science with Traditional Owner biocultural knowledge with the aim of building more robust and fit for purpose knowledge systems, and foster exchange of knowledge across these systems. Using the Central Highlands as a pilot, and as agreed with Traditional Owners, VEAC intends to include the outcomes of the TLaWC biocultural assessment in VEAC's final report in 2024. VEAC is committed to supporting the role of traditional knowledge and the integration of biocultural knowledge into land use planning and decision-making, as well as continuing the exploration of areas of alignment and possible knowledge convergence with Victorian Traditional Owners over time.

1.6 Information sources

In preparing this report, information was sourced from various government datasets such as the Victorian Biodiversity Atlas, published reports, external publicly available datasets such as the Melbourne Water Open Data Hub, meetings with land managers and resource managers, and from community groups and forest users where available.

Much of the information provided in this report on topics such as apiary sites, wildfire history, planned burn history and logging has been sourced from department records and can be viewed using the publicly available online mapping tool at MapshareVic.

Traditional Owner biocultural assessments or statements of Aboriginal cultural heritage values, rights and interests will be published on VEAC's website as and when available and incorporated as agreed with Traditional Owners in VEAC's final report to the Minister in mid-2024 (see section 1.5).

The extent and nature of assessments of biodiversity and other values are shaped by the size of the assessment area, the time provided, and the available data and expertise. For VEAC's 2017 Assessment of the Conservation Values of State Forests, VEAC commissioned specialist modelling and spatial analysis expertise through (then) DELWP's Arthur Rylah Institute for Environmental Research (ARI) and utilised the best available biodiversity data at the time. Since then, a considerable amount of additional information has been collected and compiled associated with modernisation of the Victorian Regional Forest Agreements and development of action statements for protection of threatened species such as the greater glider.

For this assessment, updated specialist modelling and spatial analysis was commissioned from DEECA's ARI for the Central Highlands area. A report on geological and geomorphological sites of significance in the assessment area was commissioned from Wakelin Associates. The Geological Survey of Victoria (DEECA) provided reports on the minerals and extractives potential and the geological and geomorphological value of the state forests including IPAs utilising publicly available datasets and de-identified data provided by the Earth Resources Regulator.

Details of information sources are provided in the relevant sections of this report and in the supplementary material available online.

1.7 Overview of the extent of Victoria's forests

For the purposes of its 2017 Statewide Assessment of Public Land VEAC recalculated the area of terrestrial land in Victoria as 22.8 million hectares (including islands, lakes and rivers) and the area of terrestrial public land as approximately 8.4 million hectares.

The 2018 State of the Forests report estimated forested public land in Victoria at 6.4 million hectares across parks, reserves and state forest.[6]

DEECA estimates that Victoria has approximately 8.2 million hectares of forests, including native forest and plantations on public and private land.

1.8 Past studies

LCC, ECC and VEAC investigations and assessments

For 50 years the role of VEAC and its predecessors, the LCC and ECC, has been to draw together scientific and other research, consult with the community and make recommendations to the government on the protection and management of Victoria's public land.

The recommendations, as accepted by government, form the framework for the way in which public land is used and managed in Victoria.

Government-accepted LCC/ECC/VEAC recommendations are binding on government departments and public authorities. The recommendations govern how the public land is used and managed, regardless of the underlying legal status. To enable the orderly investigation of public land, the LCC initially divided Victoria into 17 study areas. The study areas for LCC regional investigations and reviews are shown in figure 1.2.

Since it made its first recommendations to government in 1973, the LCC and its successors have conducted 49 separate regional studies, reviews and statewide or special investigations on most public land in Victoria. The area-specific recommendations of the councils identify land use categories and, for each category, specify its purpose, nominate the suitable uses and list the uses that are not permitted.

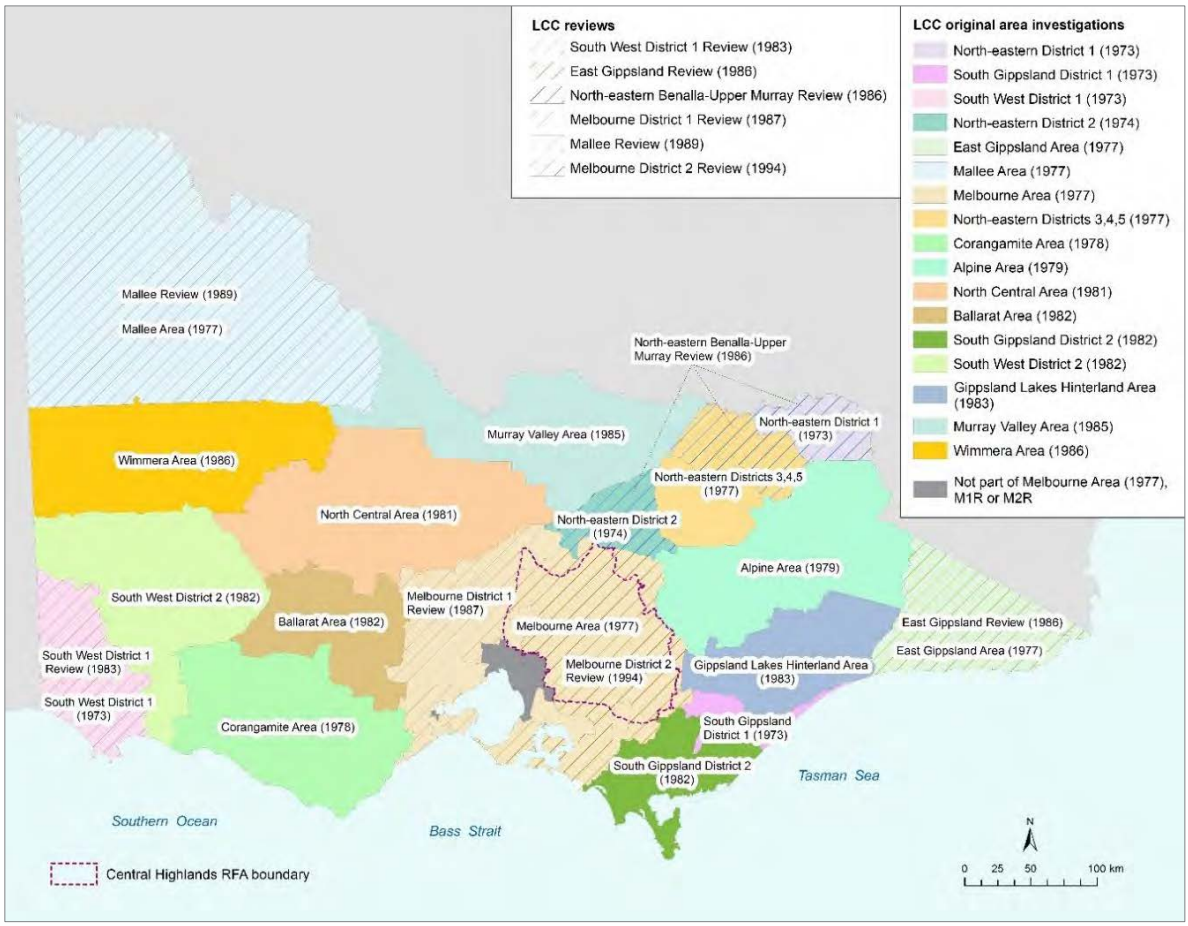
The current state forest, including the areas identified as IPAs in the Central Highlands, were included in the LCC's final recommendations to remain as 'hardwood production' within state forest in the Melbourne District 2 Review (1994) and were accepted by government through Orders in Council dated 5 September 1995 and 17 June 1997.

VEAC investigations and assessments of relevance to the area include the Remnant Native Vegetation Investigation (2011), Statewide Assessment of Public Land (2017) and the Assessment of the Conservation Values of State Forests (2017).

The terms of reference for this assessment state that it will build upon the Council's Conservation values of state forests – Assessment report (2017) by providing a more localised assessment of these areas.

6 ces.vic.gov.au/sites/default/files/publication-documents/State%20of%20the%20Forests%202018%20Report.pdf

Figure 1.2 LCC investigation areas, districts and reviews



Regional Forest Agreements

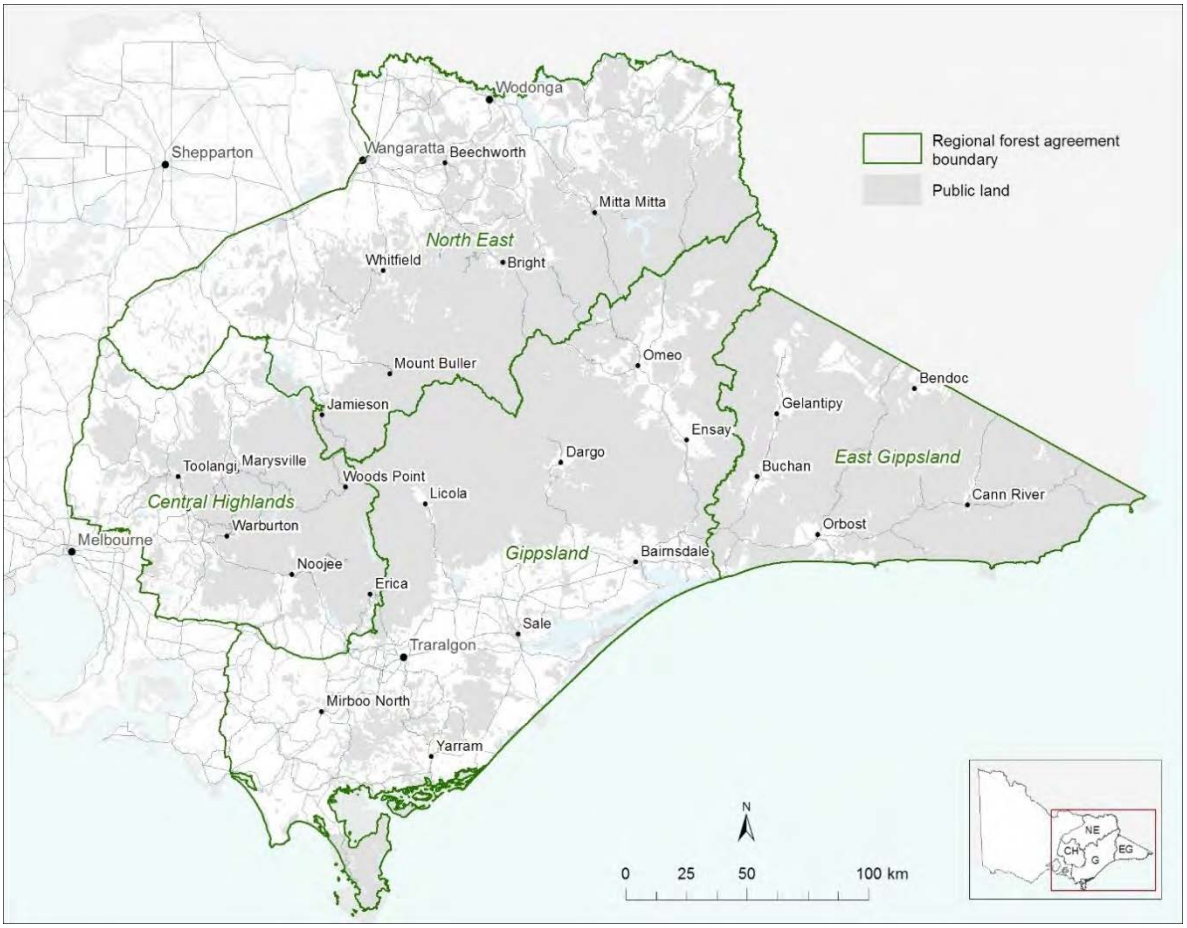
At the national level, the National Forest Policy Statement, first published in 1992, sets out a nationally shared vision for the ecologically sustainable management of Australia's forests.

Regional forest agreements (RFAs) between the federal, state and territory governments were a key outcome of the National Forest Policy Statement. Victoria has five such agreements, signed between 1997 and 2000. These agreements were intended to last for 20 years.

Each RFA in Victoria was developed following a comprehensive regional assessment within each relevant region. The CRAs considered timber production, regional employment, biodiversity conservation, wilderness, water catchment protection, tourism, recreation, and cultural and heritage values.

Eastern Victoria's regional forest agreement areas are shown in figure 1.3.

Figure 1.3 Regional Forest Agreement Areas east of the Hume Highway



On 30 March 2020, 10-year extensions were formalised for the five Victorian RFAs covering the Central Highlands, East Gippsland, Gippsland, North East and West Victorian regions. To inform the extension of the Victorian RFAs, the Australian and Victorian governments undertook a further assessment of forest-related environmental, social and economic values in the Victorian RFA regions.[7] The extensions followed this assessment process, public consultation and independent review. The consultation summary report for the Central Highlands region can be viewed at awe.gov.au/sites/default/files/documents/consultation-summary-report-central-highlands.pdf

The new RFAs include a requirement to undertake Threatened Species and Communities Risk Assessments (TSCRA) for species and communities listed under the *Flora and Fauna Guarantee Act 1988* (FFG Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that occur within an RFA region and are, or have the potential to be, impacted by forestry operations.

TSCRA reports released in September 2022 build upon existing protections for forest-dependent threatened species and communities.[8] They support the Victorian forest management system to deliver on key objectives of the RFAs: the conservation and recovery of threatened species and communities and the ecologically sustainable management of Victoria's forests.

A new feature of the modernised Victorian RFAs is that the Victorian and Australian governments can undertake a joint review to assess the impacts of major events, such as significant natural disturbances, that may have a significant impact on RFA matters.

7 awe.gov.au/sites/default/files/documents/qid78487_att_a_-_further_assessment_of_matters_report_2019.pdf

8 environment.vic.gov.au/conserving-threatened-species/threatened-species-and-communities-risk-assessment

Following the 2019–20 bushfires, the Commonwealth and Victorian governments agreed to undertake a Major Event Review to assess the impacts of the fires and identify if future remedial actions need to be taken. The major event review was overseen by an independent panel. A summary report was published in 2021 presenting known data about key impacts of the 2019–20 bushfires on Victoria's RFAs, to inform public consultation and the work of the panel.[9] The panel completed its deliberations and submitted its final report to the Victorian and Commonwealth Governments in March 2022.[10] The report is under consideration. In line with the Scoping Agreement for the Major Event Review, the Victorian and Commonwealth Governments will determine an agreed approach to responding to the recommendations in the report.

1.9 Victoria's protected area system

Protected areas – national parks, wilderness areas, nature reserves and so on – are the cornerstone of biodiversity conservation. Effectively managed systems of protected areas are recognised as critical instruments in achieving the objectives of the United Nations Convention on Biological Diversity (CBD) and the Sustainable Development Goals.

Protected areas are defined by IUCN (International Union for Conservation of Nature) as follows:

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

All the state and territory governments and the Australian government have agreed to adopt international standards for the definition of a protected area used by the IUCN, e.g. under Australia's Strategy for the National Reserve System 2009–2030.

Through the CBD the Australian and Victorian governments are committed to establishing a representative protected area system. For terrestrial areas, this is largely achieved through the National Reserve System (NRS). The NRS is a formally-recognised, national network of protected areas which cover terrestrial and inland freshwater ecosystems. It is complemented in marine environments by the National Representative System of Marine Protected Areas (NRSMPA). The NRS and the NRSMPA processes incorporate the broad requirement for a comprehensive, adequate and representative protected area system. This is commonly referred to as the 'CAR' system. Protected areas also include areas outside the CAR system where their primary purpose is to protect particular features of the natural environment.

National targets have been set in agreements between the Commonwealth and state/territory governments to help establish a comprehensive, adequate and representative terrestrial protected area system. The first of these were developed in 1996 for forests and are widely known as the JANIS criteria.[11]

The CAR system for protected areas in Victoria has its origins in forest policy of the 1990s; however there are significant differences between the CAR system for Victoria's forests under the RFAs and the protected area CAR system. Broadly speaking the CAR system for protected areas does not include 'informal reserves' or areas where 'values are protected by prescription' which are recognised in the CAR system under the RFAs.

Some park categories which are not categorised as protected areas may also be included in the RFA CAR system with its focus on areas where timber harvesting is prohibited or excluded. Regional parks exclude timber harvesting but are not categorised as protected areas because their

9 delwp.vic.gov.au/__data/assets/pdf_file/0023/542156/Summary_Report_May_2021_-_Accessible_Version_002.pdf

10 agriculture.gov.au/sites/default/files/documents/vic-rfa-mer-bushfires-report-2022.pdf

11 JANIS (1997) Nationally agreed criteria for the establishment of a comprehensive, adequate and representative reserve system for forests in Australia. Commonwealth of Australia, Canberra, Australia.

primary purpose is related to informal recreation for potentially large numbers of people in a natural or semi-natural setting. Historic reserves are not protected areas for similar reasons relating to their primary purpose being other than protection of nature. Other differences are that the CAR system for protected areas covers all Victoria's natural environments, while the RFA system is restricted to forested land in RFA regions.

'30 by 30'

The Kunming-Montreal Global Biodversity Framework was agreed internationally in December 2022. It includes the flagship '30 by 30' target: to ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, are effectively conserved and managed.[12] The Australian Government is a member of the High Ambition Coalition for Nature and People and a member of the International Steering Committee established to drive the implementation of the 30 by 30 target globally.

Australia's environment ministers met in June 2023 and acknowledged the significant outcome in the adoption of the Kunming-Montreal Global Biodiversity Framework. Ministers agreed to take shared action to address the biodiversity crisis by setting ambitious national targets, in line with the Global Biodiversity Framework, by mid 2024; and by 2024 develop a roadmap to protect and conserve 30 per cent of Australia's land.[13]

1.10 Policy context

Management of state forests in Victoria is carried out within a complex legal and policy framework. An overview of Victoria's forest management system was published in late 2019.[14] This document provides an overview of Victoria's forest management system at December 2019 and its various components, including legislation, policies, codes, plans and management practices and processes. This system is undergoing significant reform with the cessation of native forest logging.

Key policies and programs recently developed or currently underway and of relevance to forest management or this assessment include:

Aboriginal self-determination

Aboriginal self-determination is about Aboriginal people being at the centre of decision-making around the issues that affect their lives. In practice, this means transferring decision-making power from the Government to Aboriginal peoples. In December 2015, the Victorian Government committed to Aboriginal self-determination as the central policy principle for guiding Aboriginal affairs. The Victorian Government Self-Determination Reform Framework guides public service action to enable self-determination in line with the government's commitment.[15]

DEECA's commitment to self-determination – Pupangarli Marnmarnepu 'Owning Our Future' Aboriginal Self-Determination Reform Strategy 2020–2025 – is its five-year roadmap that enables self-determination at DEECA by honouring the rights and dignity of Traditional Owners and Aboriginal Victorians.[16]

12 cbd.int/gbf/targets/3/

13 Environment Ministers' Meeting Communique 9 June 2023 (dcceew.gov.au)

14 delwp.vic.gov.au/__data/assets/pdf_file/0027/458640/Forest-Management-System-Overview-2019-1.pdf

15 firstpeoplesrelations.vic.gov.au/self-determination-reform-framework

16 delwp.vic.gov.au/__data/assets/pdf_file/0038/483887/Pupangarli-Marnmarnepu-Owning-Our-Future-Aboriginal-Self-Determination-Reform-Strategy-2020-2025.pdf

Victorian Traditional Owner strategies

Cultural landscape strategy

Victorian Traditional Owners developed the Cultural Landscapes Strategy to set out a framework to systematically enable and empower Victorian Traditional Owners to lead planning and activate cultural knowledge and practices to manage Country.[17]

Game management strategy

The Traditional Owner Game Management Strategy sets out how Victorian Government departments and agencies will partner with Traditional Owners to deliver practical actions to build Traditional Owner participation in hunting, land management and conservation.[18]

Cultural fire strategy

The strategy articulates the aspirations of Traditional Owners to practise cultural burning and ensure knowledge about fire is sustained through generations.[19]

Renewing Victoria's public land legislation

The Victorian government is renewing Victoria's public land legislation, including the creation of a new Public Land Act and the modernisation of the *National Parks Act 1975*.[20]

Biodiversity 2037

Released in 2017, Protecting Victoria's Environment – Biodiversity 2037 (Biodiversity 2037) presents a long-term vision for Victoria's biodiversity supported by two overarching goals:

- Victorians value nature, and
- Victoria's natural environment is healthy.

Wildlife legislation review

In May 2020, the then Minister for Energy, Environment and Climate Change announced a comprehensive review of the *Wildlife Act 1975*. The first stage of this review was led by an independent Expert Advisory Panel, appointed in 2020. The review is part of a wider examination of Victoria's legislative framework for protecting and managing biodiversity.[21] The panel delivered its report to the Minister on the findings of the review in December 2021. This report will be made publicly available at a later date, together with the government response.

Climate change adaptation action plans

Adaptation Action Plans have been prepared for seven essential systems, including the natural environment, that are vulnerable to climate impacts or critical to our climate resilience.[22] A stocktake document supporting the Natural Environment Climate Change Adaptation Action Plan 2022-2026 provides a brief look at some of the programs, policies and strategies currently being undertaken across the natural environment sector that contribute to climate change adaptation.[23]

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17 fvtoc.com.au/cultural-landscapes

18 https://fvtoc.com.au/sections/animals/

19 https://knowledge.aidr.org.au/media/6817/fireplusstrategyplusfinal.pdf

20 engage.vic.gov.au/rene https://fvtoc.com.au/sections/animals/wing-victorias-public-land-legislation

21 See engage.vic.gov.au/independent-review-victorias-wildlife-act-1975

22 environment.vic.gov.au/__data/assets/pdf_file/0030/558264/Natural-environment-Climate-Change-Adaptation-Action-Plan-2022.pdf

23 environment.vic.gov.au/__data/assets/pdf_file/0027/558243/NEAAP-stocktake.pdf

Bushfire emergency – biodiversity response and recovery

The bushfires of 2019–2020 were exceptional in size and impact. Guided by analysis of the fire extent as of 20 April 2020 DELWP/DEECA has worked alongside species experts, academics, and land managers to prioritise actions for fire-affected threatened species and habitats. The Bushfire Biodiversity Response and Recovery Program has several focus areas and associated actions, including applying a cultural landscape lens to species renewal and resilience using cultural knowledge and practices.

1.11 Management arrangements and administrative areas

Table 1.2 The Central Highlands RFA area is located within the following administrative areas

Local Government Area	DEECA Region	Forest Management Area	Catchment Management Authority
Baw Baw Cardinia Mansfield Mitchell Murrindindi Whittlesea Yarra Ranges	Hume Port Phillip Gippsland	Dandenong Central Gippsland Central	Melbourne Water Goulburn Broken West Gippsland
Banyule* Darebin* Hume* Knox* Latrobe* Manningham* Maroondah* Nillumbik*			

* Metropolitan Melbourne Local Government Areas that extend into the fringes of the Central Highlands area

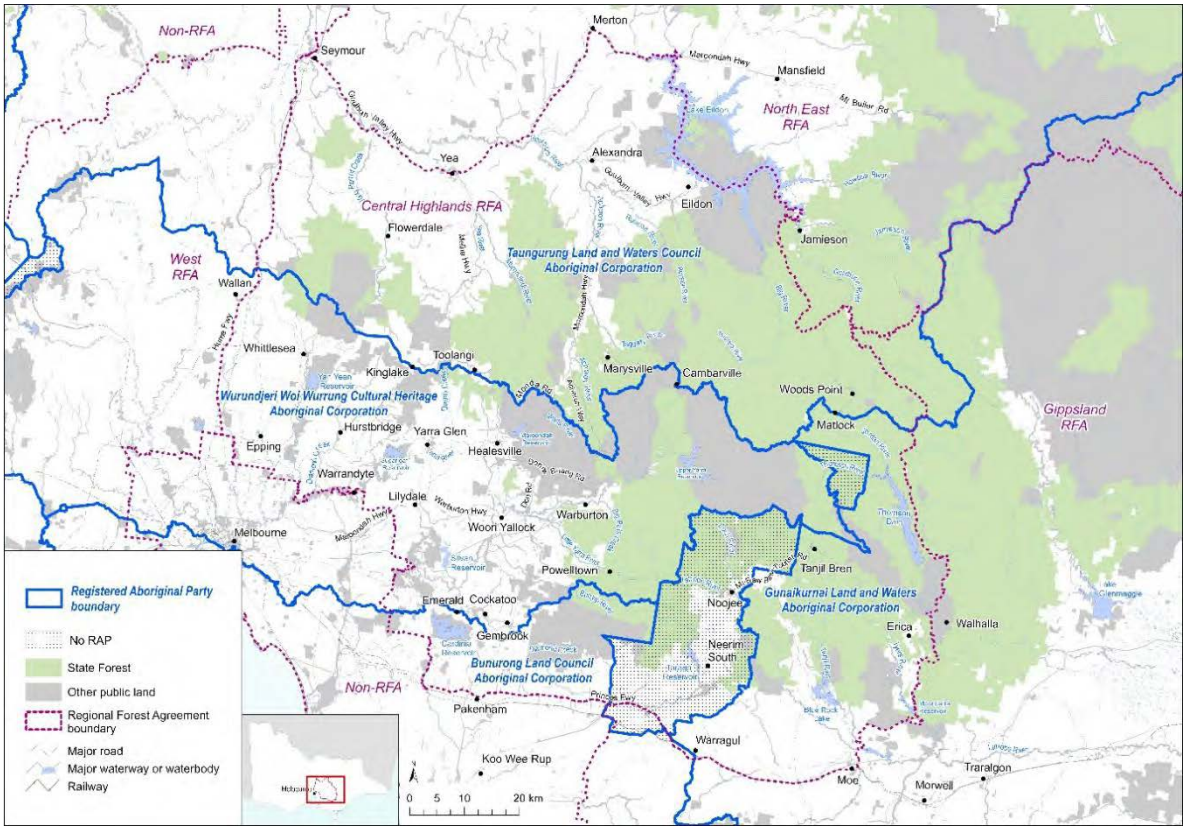
1.12 Registered Aboriginal Parties (RAPs)

The Victorian Aboriginal Heritage Council appoints Registered Aboriginal Parties (RAPs) to manage and protect Cultural Heritage on their country. RAPs are representative corporations, inclusive of all Traditional Owners of an identified Country. The Victorian *Aboriginal Heritage Act 2006* recognises RAPs as the primary guardians, keepers and knowledge holders of Aboriginal Cultural Heritage.

There are 11 RAPs covering approximately 75 per cent of Victoria. The Central Highlands area intersects the following four RAP areas (see figure 1.4).

- Bunurong Land Council Aboriginal Corporation (BLCAC)
- Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC)
- Taungurung Land and Waters Council (TLaWC)
- Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation (WWWCHAC)

Figure 1.4 Registered Aboriginal Parties (RAPs) areas



2. Regional and landscape context

This section provides an overview of the region and landscape of the Central Highlands Regional Forest Agreement (RFA) area.

2.1 Regional overview

The Central Highlands RFA area encompasses a significant and diverse region in Victoria, characterised by its unique geography, ecosystems, and land use. It covers an area of some 1,132,000 hectares of which 617,000 hectares is public land.

The Central Highlands RFA area is located north and east of metropolitan Melbourne, extending from Seymour to Lake Eildon in the north, the Hume Freeway in the west, Baw Baw National Park and Moe in the east and the Princes Highway in the south. It includes the townships of Lilydale, Toolangi, Healesville, Marysville, Alexandra, Eildon, Kinglake, Whittlesea, Woods Point, Warburton, Powelltown, Noojee, Erica, Neerim South and Warragul. The RFA area is largely covered by the Murrindindi, Yarra Ranges, Mansfield, Baw Baw and Cardinia Local Government Areas (LGAs) with small areas of several metropolitan LGAs extending into the fringes of the area.

A socio-demographic profile of the region will be prepared for VEAC's final report in mid 2024 to provide a broad overview of the nature of the region from both a population and economy perspective.

The Dividing Range is the dominant geographical feature in the region. Running east-west, it divides the region into north and south, strongly influencing weather and fire conditions and leading to generally drier conditions in the north of the region, where mixed-species forests and woodlands are more prevalent. But it is the wet forests of the south and at higher elevations for which the Central Highlands are recognised nationally and internationally. These montane ash forests are dominated by alpine ash (*Eucalyptus delegatensis)* and mountain ash (*Eucalyptus regnans)*, the world's tallest flowering plant. These forest giants tower over tree ferns and a diversity of understory and ground-cover plants to form rich and distinctive ecosystems in which lyrebirds, gliders, whipbirds, owls, platypus and many less well-known species are also intrinsic components.

While ash forests are found elsewhere, nowhere else are they as extensive, intact and characteristic as they are in the Central Highlands. Dominating a large part of the landscape, they have evolved to a high level of species richness and diversity. The Central Highlands forests are home to Victoria's faunal emblem, the Leadbeater's possum.

The ash forests have supplied high grade, high strength timber for over 100 years for uses such as house framing and floorboards as well as for fibre and pulp for paper. With the high natural values of ash forests, there have been many decades of debate over the extraction of a natural resources versus nature conservation. Existing national parks within the boundary of the Central Highlands RFA include the Kinglake, Yarra Ranges and Baw Baw national parks. A Great Forest National Park has been advocated for by international and national conservation interests for most of the state forests in the Central Highlands for more than a decade.

The Central Highlands, and the ash forests in particular, are a significant source of freshwater for Victoria, containing the headwaters of many important rivers, notably the Yarra, Latrobe, Thomson and Goulburn (see section 2.5). The area's water catchments contribute much of greater Melbourne's high quality drinking water – a valuable and precious resource – requiring considerably less energy and cost for treatment compared to most cities in the world (see section 3.3). The Goulburn River is one of the most important rivers in northern Victoria, supplying water essential for a wide range of popular recreational activities, ecologically significant waterways, wetlands and floodplain forests, and economically significant irrigated agriculture and stock and domestic uses supporting industry and communities downstream to the Coorong in South Australia. Much of that

water comes from rainfall in the Central Highlands. The same is true of the Latrobe and Thomson Rivers, which are of comparable importance in Gippsland.

Detailed information on the values and uses of the forests is provided in chapter 3.

2.2 Public land

The Central Highlands RFA covers a total area of 1,131,840 hectares. Nearly half of this land, totalling 514,870 hectares, is in private, local government and Commonwealth ownership, and primarily used for agriculture. The remaining half of the RFA area comprises mostly native forest on public land (see table 2.1).

As shown in table 2.1 and figures 2.1 and 2.2, public land in the RFA area is dominated by state forest, which accounts for 63 per cent (389,725 hectares) of the total public land area, followed by 27 per cent (165,747 hectares) of land allocated to national and state parks. The remaining land comprises various reserves, regional parks and uncategorised public land. An A1 version of figure 2.2 is in the supplementary material available online.

Table 2.1 Extent of public land use categories and private land (Source: VEAC)

Public land use category	Area (ha)	Per cent (%)
Private, local government and Commonwealth land	514,870	45
State forest	389,725	34
National park, State park	165,747	15
Water production reserve	16,808	1
Land leased or licenced for plantation purposes, Plantation	8,990	1
Regional park	7,091	1
Nature reserve	6,963	1
Water frontage, beds and banks reserve	6,389	1
Bushland reserve	6,183	1
Historic reserve	2,651	<1
Community use reserve	2,649	<1
Utilities and government services reserve	1,684	<1
Alpine resort	857	<1
Uncategorised public land	814	<1
Wildlife and game reserve	240	<1
Trust for Nature protected area	180	<1
Total	**1,131,840**	**100**

Figure 2.1 Proportion of public land use categories

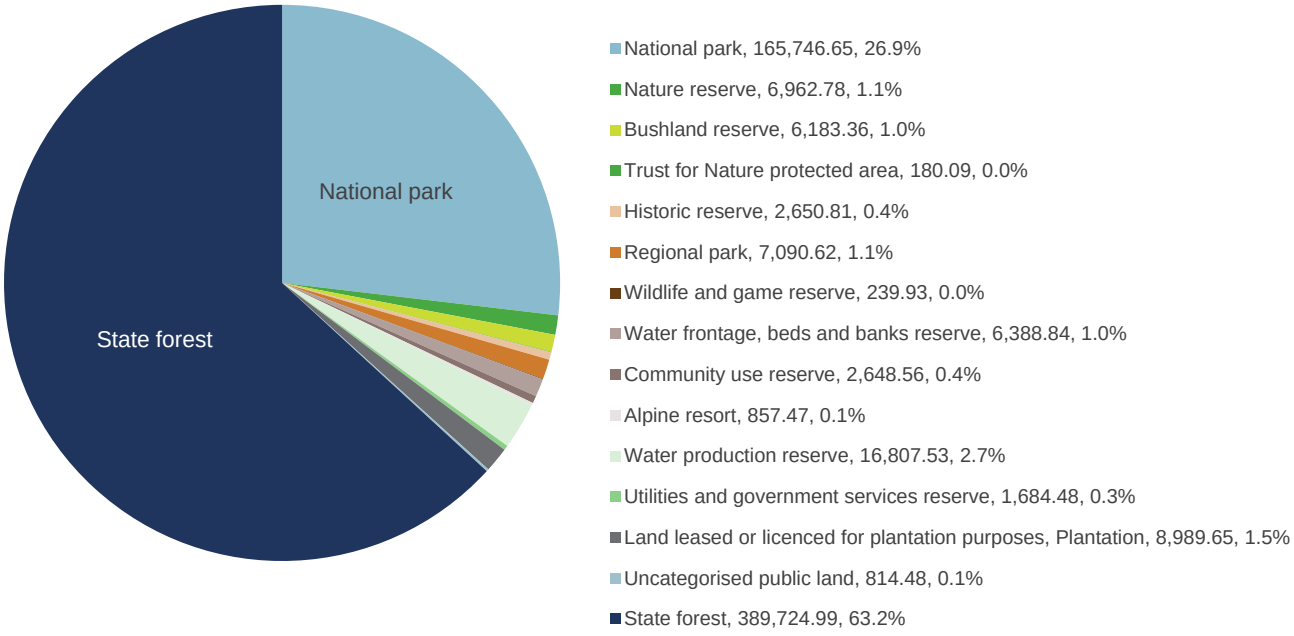
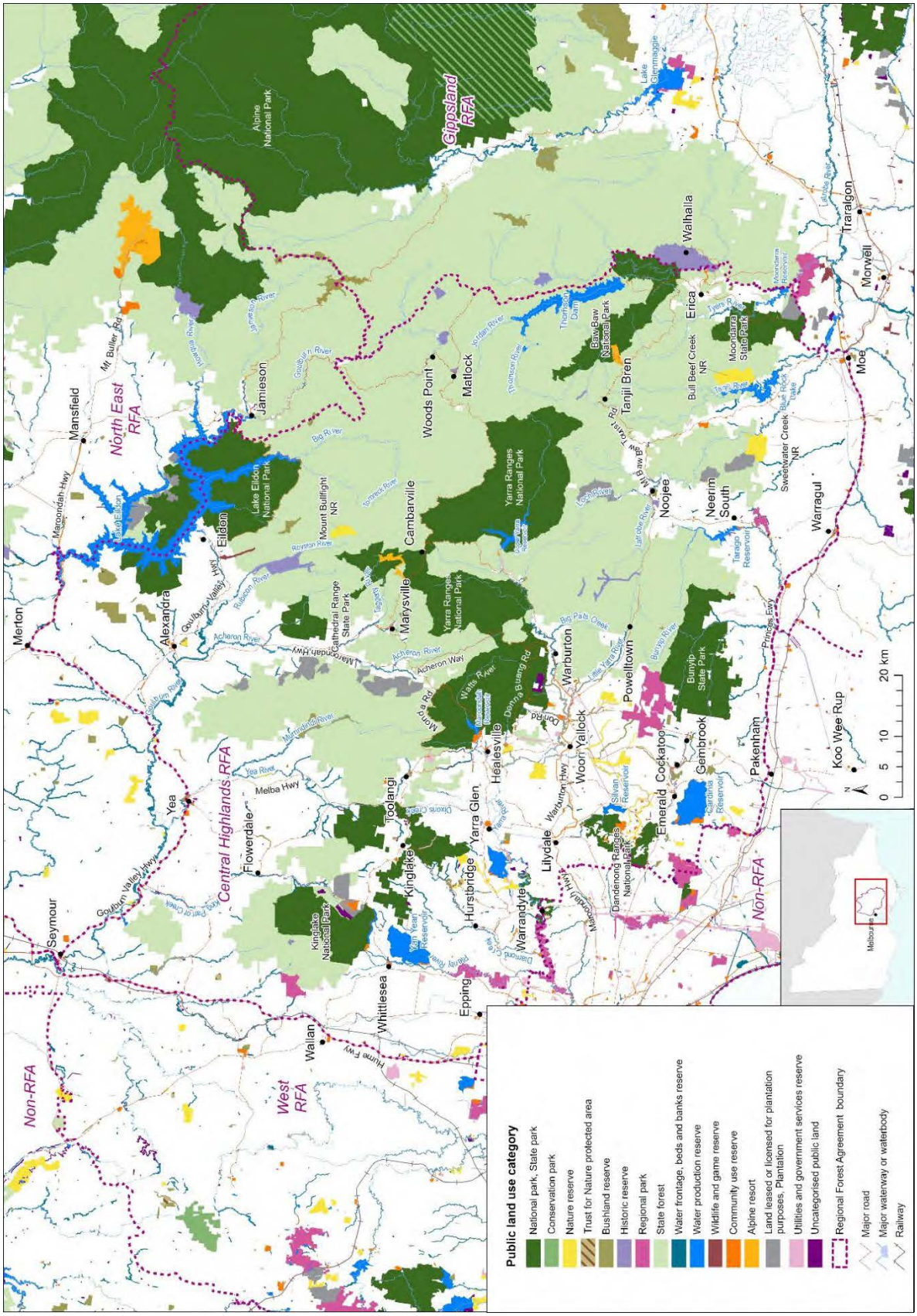


Figure 2.2 Central Highlands RFA area public land use



2.3 Landscape and climate

Bioregions are a landscape-scale classification of the environment delineated by physical characteristics such as geology, natural landforms, and climate, which are correlated to ecological features, plant and animal assemblages and landscape-scale ecosystem processes. Eleven of the 89 terrestrial bioregions recognised nationally occur in Victoria. The broad scale appropriate for national purposes does not provide adequate discrimination at a statewide level, and Victoria has been further subdivided into 28 bioregions (equivalent to national sub-regions) (figure 2.3).

The Central Highlands RFA area overlaps with parts of eight Victorian bioregions (see figure 2.4).

The two dominant bioregions are the Highlands – Southern Fall and Highlands – Northern Fall which cover 47 per cent and 23 per cent of the RFA area respectively. As their names suggest, they cover the highest slopes to the south and north of the main dividing range. They contain the vast majority of the region's cool temperate rainforest and the characteristic tall wet forests of mountain and alpine ash and shining gum (*Eucalyptus nitens*), as well as substantial areas of mixed species forests. They tend to have high and relatively reliable rainfall, particularly on the higher slopes and those that face to the south and west and capture rain in the prevailing moisture-laden winds from the southwest. The underlying geology is a diverse arrangement of older volcanic remnants, granitic outcrops and Palaeozoic sediments. Public land accounts for 56 per cent of the Highlands – Southern Fall and 78 per cent of the Highlands – Northern Fall.

The Central Victorian Uplands and Victorian Alps also account for sizeable portions of the RFA area – 14 per cent and eight per cent respectively. The Central Victorian Uplands comprise the drier foothills of the dividing range, extending north from the northern edge of the Highlands – Northern Fall. Drier, more open forests and woodlands dominate what native vegetation remains in this bioregion. Nine per cent of the Central Victorian Uplands in the RFA area is on public land. The Victorian Alps bioregion covers a number of large and small patches on the higher peaks and plateaus in the east of the RFA, such as Lake Mountain, the Baw Baw and Toorongo Plateaus and Mounts Donna Buang, Torbreck, Bullfight and Matlock. Native vegetation ranges from alpine heaths and snow gum woodlands to ash forests and cool temperate rainforests. All but 0.5 per cent of this bioregion in the RFA area is on public land.

The remaining eight per cent of the RFA area accounts for small parts of the Gippsland Plain, Strzelecki Ranges, Victorian Volcanic Plain and Victorian Riverina bioregions. Large areas of these bioregions occur beyond the RFA area, especially the last two which are two of the largest bioregions in Victoria. Within the Central Highlands RFA area, private land accounts for more than 90 per cent of each of these bioregions.

Weather patterns in the Central Highlands are primarily shaped by the landscape and latitude. Summers are hot and dry, with occasional rainfall from cool fronts and not infrequent afternoon thunderstorms. In winter, low-pressure systems bring moist air from Bass Strait to the western and southern elevated ranges, from Mount Disappointment to Mount Baw Baw, resulting in substantial average annual rainfall, up to 1700 millimetres. These conditions are favourable for the growth of tall, moist ash forests.[24]

24 Central Highlands-Comprehensive Regional Assessment Report (1997).

Figure 2.3 Victorian bioregions

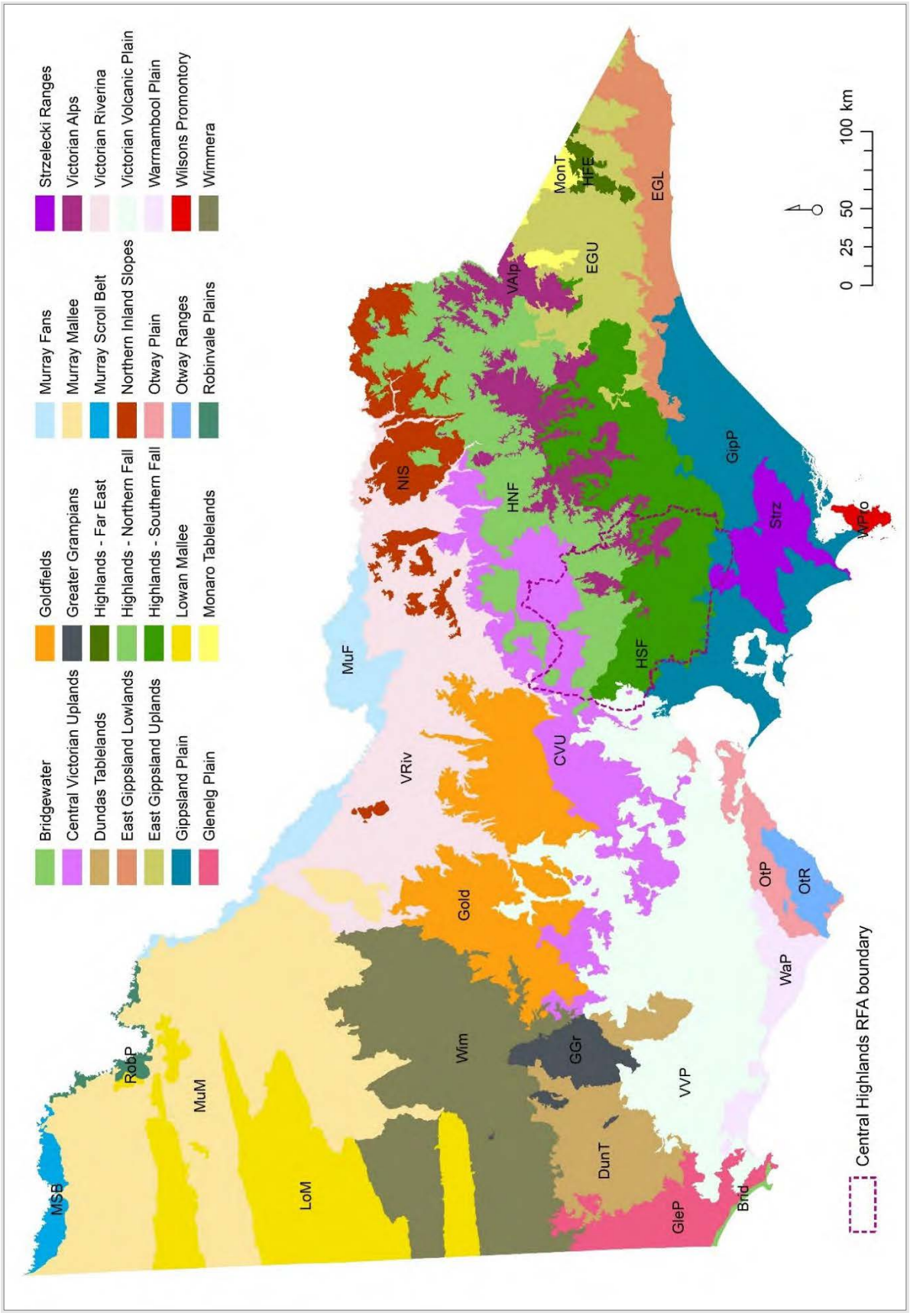
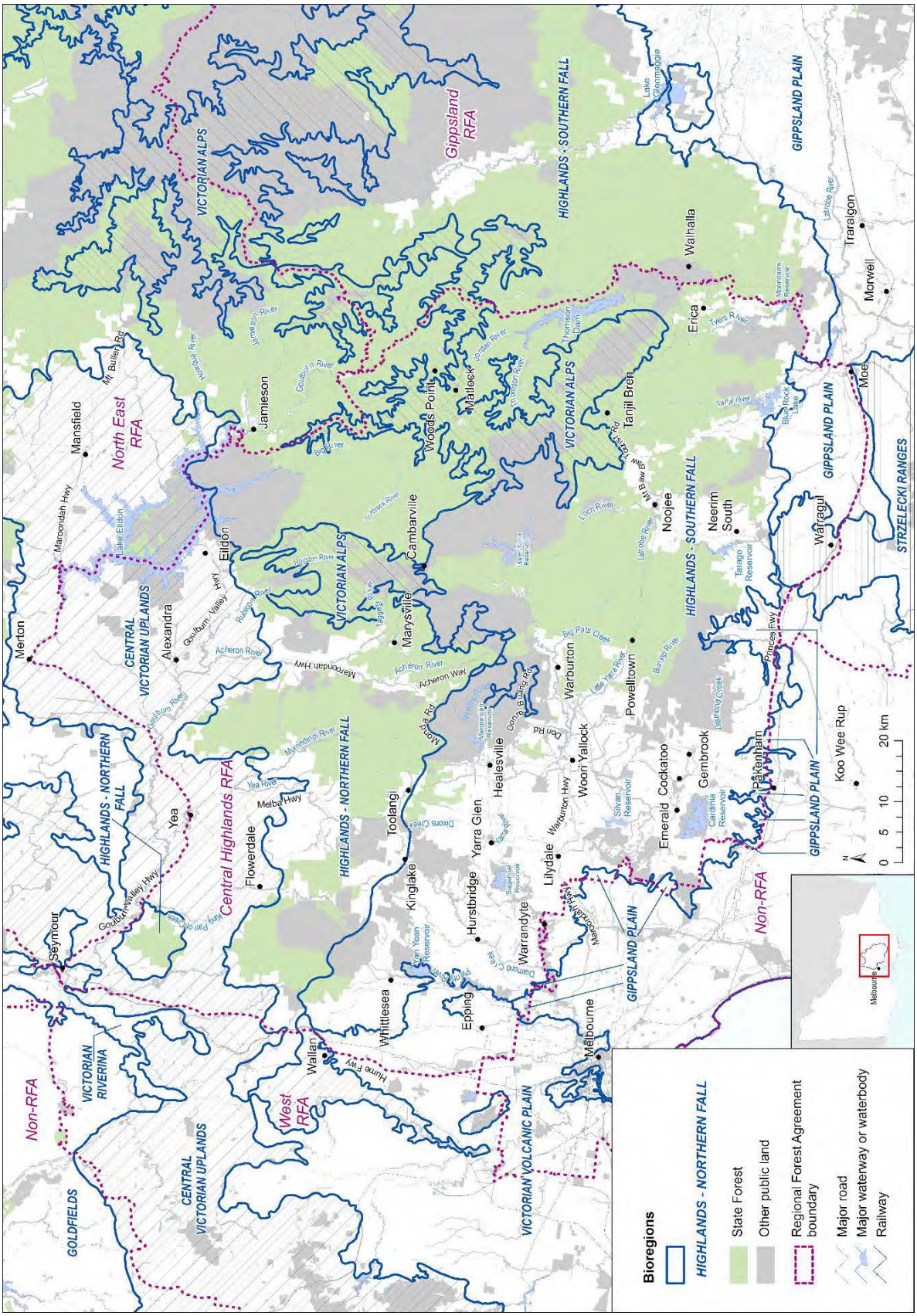


Figure 2.4 Bioregions in the Central Highlands RFA area



2.4 Fire history

DEECA records show fires occurring on public lands in Victoria since 1903 to the 2021–2022 season. A history and maps of past bushfires in Victoria back from 2020 to 1851 is available on the Forest Fire Management Victoria website Past bushfires (ffm.vic.gov.au).

As shown in figure 2.5, major fires in the Central Highlands RFA area include:

Black Saturday 2009

The Kilmore East – Murrindindi fire in January–February 2009 (also known as the Black Saturday fires) burnt large parts of the forests east of Kilmore to the southern tip of Lake Eildon in the east and as far south to around Healesville and almost to the Upper Yarra Reservoir, with a separate fire near and through Bunyip State Park.

Ash Wednesday 1983

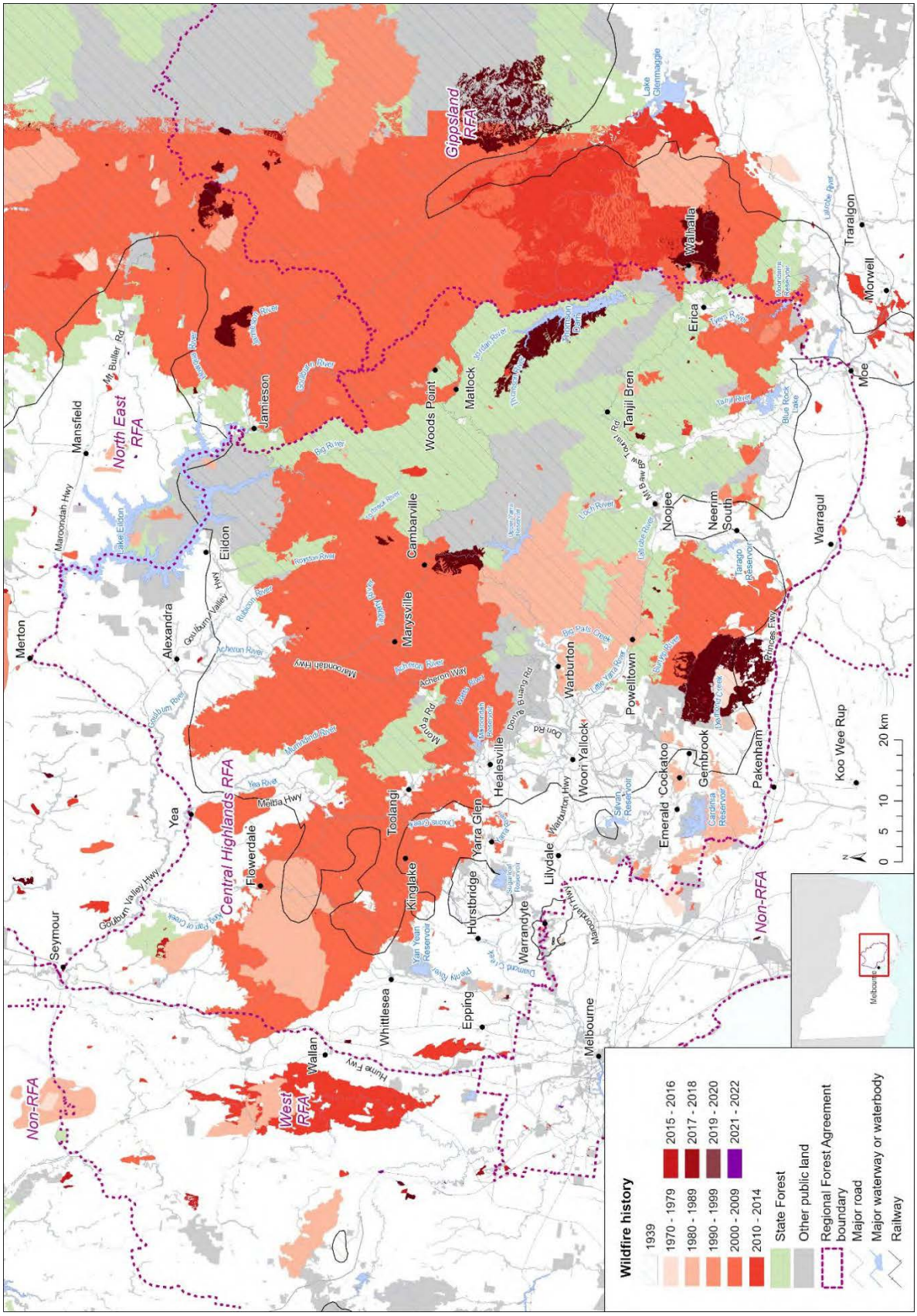
On Ash Wednesday, 16 February 1983, areas around the State were severely burnt. State forests burnt in the Central Highlands RFA area included a large area extending east of Warburton to the Upper Yarra Reservoir and south to Powelltown. A large area of forest near Kinglake and Mount Disappointment was also burnt.

Black Friday 1939

Figure 2.5 shows that the majority of forests in the Central Highlands RFA area were burnt in the 1939 Black Friday fire.

Figure 2.5 indicates that some parts of the forests east of Toolangi, southeast of Noojee, west of Matlock, and around the Thomson Dam have no recorded wildfires since 1970. These forests, however, and most of the RFA forests were burnt in the extensive 1939 fire.

Figure 2.5 Wildfire history since 1970 and 1939 fire extent in the Central Highlands



Planned burn history

DEECA records show a history of planned burns occurring on public lands in Victoria since 1970, although there was undoubtedly extensive burning before then. Figure 2.6 shows the planned burn history across the Central Highlands RFA since 1970.

Box 2.1

Planned burning in Victoria

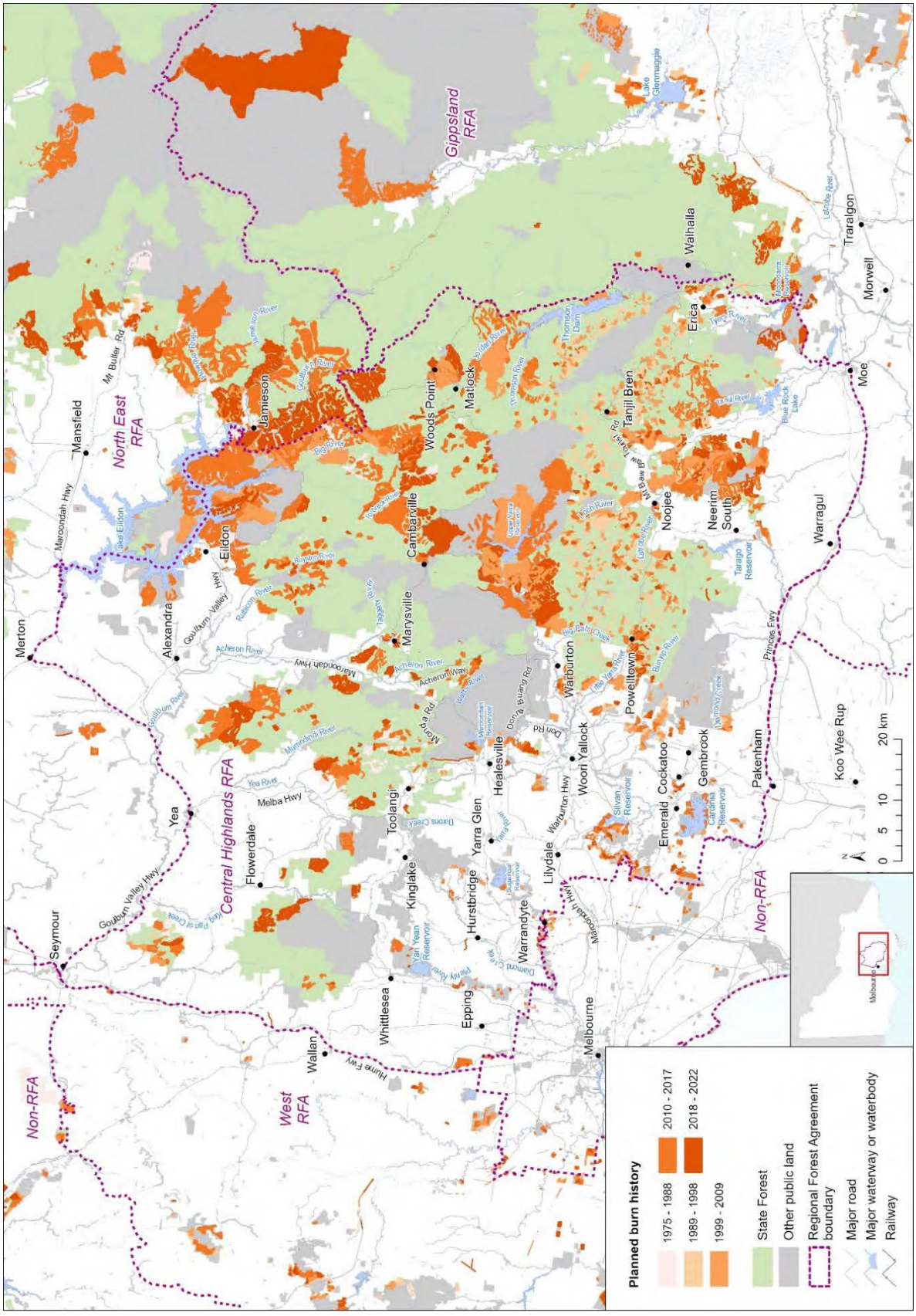
Forest Fire Management Victoria (FFMVic) involve the local communities year round in decision making about bushfire management to determine local solutions to reduce bushfire risk Managing bushfire risk (ffm.vic.gov.au). Strategic bushfire management planning across public and private lands is jointly delivered by Forest Fire Management Victoria (FFMVic), Country Fire Authority (CFA), Emergency Management Victoria (EMV), and local government in consultation with communities. Strategic Bushfire Management Planning (safertogether.vic.gov.au).

Objectives for planned burns vary but are predominantly to reduce fuel loads so that the severity of any subsequent wildfire is reduced. Some planned burns can have cultural Traditional Owner burns (ffm.vic.gov.au) and ecological objectives. Plants and animals (ffm.vic.gov.au). Traditional Owners have nominated and will carry out all Cultural burns, with support from FFMVic and CFA. Approximately 86 Cultural burns are identified for 2022–2023.

As well as planned burning, FFMV undertake slashing and clearing works to create fuel breaks to reduce the risk of bushfire on public land. Strategic Fuel Breaks Program (ffm.vic.gov.au) Fuel management aims to reduce the spread and intensity of bushfires and make suppression more achievable and safer.

The Joint Fuel Management Program Joint Fuel Management Program (JFMP) (ffm.vic.gov.au) is a statewide program that manages fuel on public and private land over the next three years. The most recent JFMP was approved on 14 November 2022. The nature and effectiveness of fire management and fuel reduction activities is contested and remains the subject of significant debate and research.

Figure 2.6 Planned burn history since 1970 in the Central Highlands



2.5 Rivers and waterways

River basins

The Central Highlands RFA area covers parts of the Yarra, Bunyip, Goulburn, Latrobe and Thomson river basins (figure 2.7). Waterways in the Goulburn River basin flow to the north of the divide, while those in the Yarra and Bunyip river basins flow to Port Phillip and Westernport Bays. The Latrobe and Thomson Rivers deliver water to the Gippsland Lakes. The responsibility for catchment management in the Central Highlands reflect these river basins: Melbourne Water for the Yarra and Bunyip basins, Goulburn Broken Catchment Management Authority (CMA) for the Goulburn basin, and West Gippsland CMA for the Latrobe and Thomson basins.

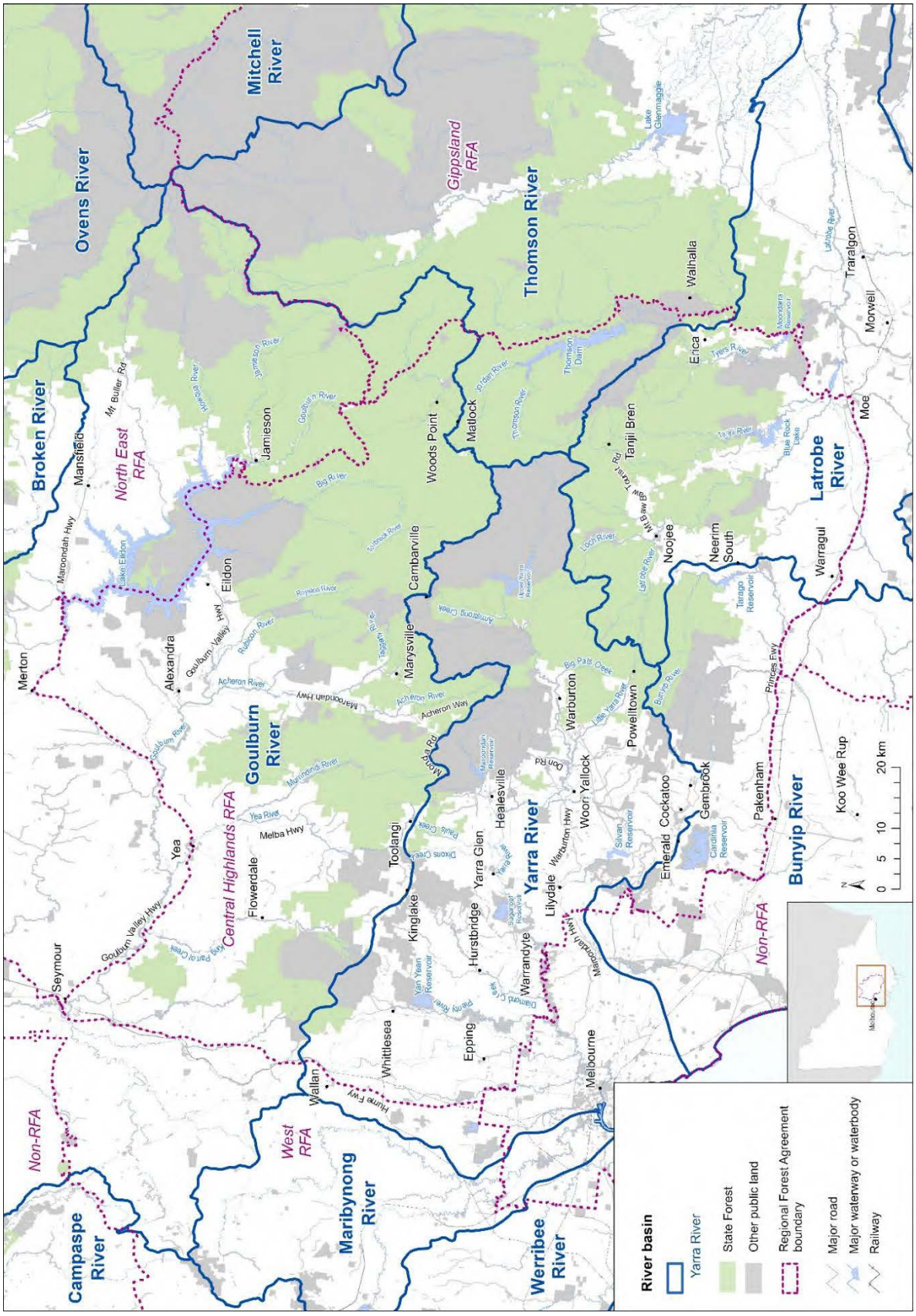
Major waterways, reservoirs and lakes

Major waterways within the Central Highlands RFA area listed in table 2.2 and illustrated in figure 2.7. Dams, reservoirs and lakes where waters from the catchments are captured and stored include the Thomson Reservoir, Lake Eildon, Blue Rock Lake, Upper Yarra Reservoir, Tarago Reservoir, O'Shannassy Reservoir, Maroondah Reservoir, Sugarloaf Reservoir, Yan Yean Reservoir, Silvan Reservoir, and Cardinia Reservoir.

Table 2.2 Waterways and reservoirs in the river basins of the Central Highlands RFA area

River basin	Waterway	Reservoir
Bunyip River basin	Bunyip River	Tarago Reservoir
	Tarago River	
Goulburn River basin	King Parrot Creek	Lake Eildon
	Yea River	
	Murrindindi River	
	Acheron River	
	Taggerty River	
	Rubicon River	
	Royston River	
	Torbreck River	
	Big River	
Latrobe River basin	Latrobe River	Blue Rock Lake
	Loch River	
	Tanjil River	
	Tyers River	
Thomson River basin	Thomson River	Thomson Reservoir
	Jordan River	
Yarra River basin	Plenty River	Upper Yarra Reservoir
	Diamond Creek	Maroondah Reservoir
	Dixons Creek	O'Shannassy Reservoir
	Pauls Creek	Sugarloaf Reservoir
	Watts River	Yan Yean Reservoir
	Armstrong Creek	Silvan Reservoir
	Big Pats Creek	Cardinia Reservoir
	Little Yarra River	

Figure 2.7 River basins, major waterways and reservoirs of the Central Highlands RFA area

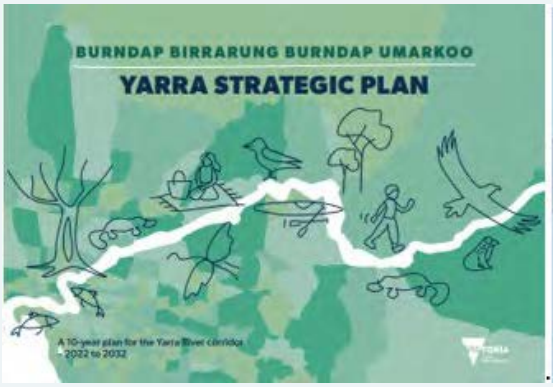


Yarra River land

Yarra River land comprises publicly owned land that has been declared for protection under the *Yarra River Protection (Wilip-gin Birrarung murron) Act 2017* including state forest east of Warburton and the Yarra Ranges National Park – see box 2.2.

Box 2.2

Yarra River land



The *Yarra River Protection* (*Wilip-gin Birrarung murron) Act 2017* is the first legislation in Australia to be co-titled in a Traditional Owner language. 'Wilip-gin Birrarung murron' translates as 'keep the Birrarung alive' in Woi-wurrung, the traditional language of the Wurundjeri Woi-wurrung people.

Woi-wurrung was used in recognition of the Traditional Owners' custodianship of the river and their unique connection to the lands through which the river flows. It is also a Victorian and Australian first in legally identifying a large river and its corridor, which transverses many boundaries, as a single living and integrated natural entity for protection.

The Act prescribes how a long-term Community Vision and a Yarra Strategic Plan, which gives effect to the vision, are developed. The Act also prescribes the establishment of a new statutory body, the Birrarung Council, to be the first independent voice of the Yarra River, as part of recognising it as a living entity. More details are available from the Wilip-gin Birrarung murron page on the DEECA website.

The role of Yarra River land is to support the health of the Yarra River and, where appropriate, allow people to access the river in its most natural state. Further information is contained in the Yarra River Action Plan and Burndap Birrarung burndap umarkoo, the Yarra Strategic Plan. In the language of the Traditional Owners, 'Burndap Birrarung burndap umarkoo' in Woi-wurrung language means, 'good for Yarra is good for all.'

2.6 Heritage rivers and reference areas

Victorian heritage rivers are listed under the *Heritage Rivers Act 1992 to* provide protection of the public land along river reaches in Victoria that have significant nature conservation, recreation, scenic or cultural heritage attributes. Natural catchment areas are also scheduled on *the Heritage Rivers Act 1992*, requiring that they be maintained in an essentially natural condition.

The *Reference Areas Act 1978* sets aside small, remote areas of public land to limit human disturbance as far as is possible, in order that they be potentially available for comparative scientific studies.

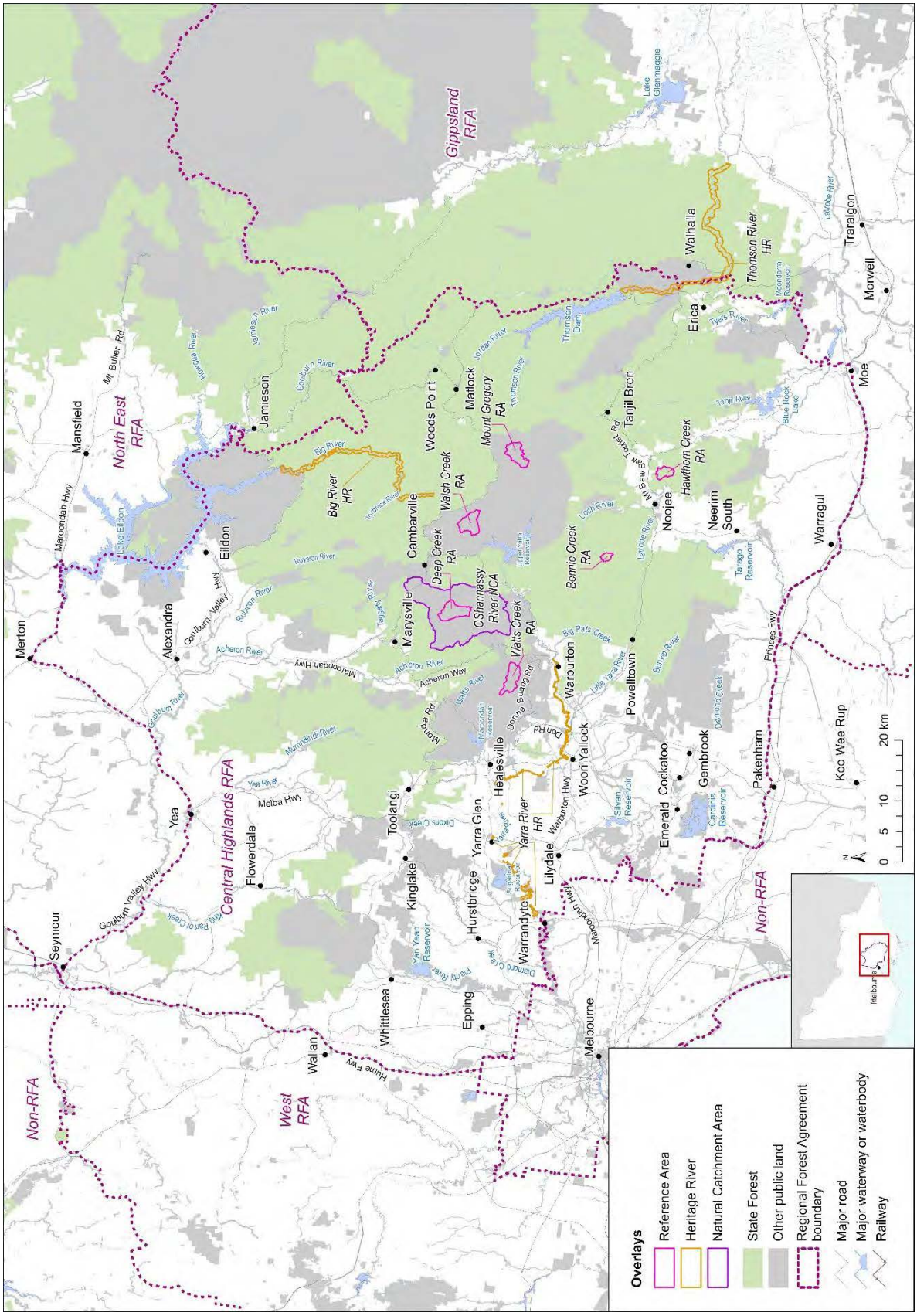
Heritage rivers and reference areas are overlays in that they are overlap with land in a variety of public land use categories such as national park, nature reserve and state forest. In the Central Highlands RFA area, there are four heritage rivers and 13 reference areas; two of each are located over state forests (figure 2.8):

- Big River Heritage Area runs along the river from its source about 12 kilometres east of Cambarville, winding past Enochs Point to Lake Eildon.
- Thomson River Heritage Area runs along the Thomson River within a very small part of the Carrang Carrang State Forest south of the Thomson Dam, then through the Baw Baw National Park, and then along the eastern edge of the state forest east of Rawson before continuing east beyond the RFA boundary.
- Bennie Creek Reference Area located in the Latrobe State Forest about 12 kilometres northeast of Powelltown.
- Hawthorn Creek Reference Area located in the Neerim State Forest about 5 km east of Noojee.

In the Central Highlands RFA area, the Yarra River Heritage Area is not located within state forest.

The O'Shannassy River Natural Catchment Area and the Deep Creek, Walsh Creek, Mount Gregory and Watts Creek reference areas are located in the Yarra Ranges National Park.

Figure 2.8 Heritage rivers and reference areas in the Central Highlands RFA area



3. Values of the Central Highlands state forests

This chapter addresses the topics in (a) and (b) of the terms of reference, to:

- identify the biodiversity, ecological and geological and geomorphological values of the specified area
- identify the cultural heritage, social and economic values of the specified area.

There has been insufficient time for biocultural assessments or statements of Aboriginal cultural heritage values, rights and interests prepared by some Traditional Owners of the land to be included in this report. These will be published on VEAC's website as and when available and incorporated as agreed with Traditional Owners in VEAC's final report to the Minister in mid-2024.

The term 'values' can be understood in different ways depending on the context. In contemporary land and resource management, environmental values are mostly conceptualised as biophysical attributes of the environment, such as landscape features and formations, and sites, processes and properties such as endangered species and biodiversity. The terms of reference reflect this usage and, in this report, VEAC mostly adopts this understanding of the term. Uses are considered here as economic, social and cultural values. More broadly 'values' can also refer to the values held by people 'for' the environment and nature, often conceived of as people's guiding principles. Values can also be understood as the 'value of' attributes or entities expressed in monetary terms, for example, of extracted natural resources or ecosystem services such as clean drinking water to the Victorian economy. In this case values are seen as commensurable, where they can be converted into a common measure such as money.

3.1 Biodiversity and ecological values

3.1.1 Threatened species

Almost 400 threatened plant and animal species have been recorded in the Central Highlands Regional Forest Agreement (RFA) area, with more than 50,000 records of these species in total.[25] Millions of records from elsewhere in Victoria also inform our understanding of flora and fauna in the Central Highlands. In recent decades, DEECA and its predecessors have developed analyses to make the best strategic use of this large dataset.

Habitat distribution modelling

Habitat distribution models have been developed to help understand the distribution of threatened species and the relative quality of habitat within each species' distribution, both of which can be prohibitively expensive and difficult to determine by direct field observation. This is because threatened species are very often scarce, patchily distributed, idiosyncratic in their habitat preferences, difficult to detect, highly mobile or live in dynamic or difficult to access locations (particularly in mountainous regions such as the Central Highlands). Even for species without these difficulties the locations of sites where records are made can be biased, such as towards places that are accessible, close to where observers live or work, or well-known places to see a particular species. Habitat distribution modelling adjusts to counter these difficulties and biases.

Habitat distribution modelling predicts where suitable habitat may exist for a species, based on locations of verified observations of the species and the biophysical attributes of those locations. The modelling essentially identifies the combinations of biophysical attributes that coincide with the occurrence of the species and maps other places where those attributes occur, to varying degrees.

25 Flora and Fauna Guarantee Act 1988 Threatened List June 2023. The numbers may change as work continues to align the list with categories and criteria for species under the Common Assessment Method (CAM) Intergovernmental Memorandum of Understanding, to which Victoria is a party.

The resulting maps show the relative likelihood of suitable habitat across Victoria, from high to low. A large number of biophysical attributes are available to assess for correlation with records of threatened species, and the attributes can be complex and interrelated. There are many measures related to rainfall, for example, other than the annual average, to incorporate things such as reliability and seasonality. For many plants these are likely to be interrelated with topography and soil parameters (especially relating to water retention) in influencing patterns of occurrence. At the same time the inclusion of multiple interrelated potential determinants is tempered to avoid bias towards those variables – such as climate in the preceding example.

Whether a species currently occurs in apparently suitable habitat at a particular location depends on many factors including the size of the habitat patch, impact of predators and disease, seasonal factors and natural disturbance cycles, and the resilience of systems to disturbance. Habitat distribution modelling can highlight issues or places for further investigation, such as areas of apparently suitable habitat with few or no records, which may provide new insights if followed up and which may in turn be fed back in to improve the modelling. Input from expert ecologists familiar with particular species can also be used to identify issues to investigate and to refine modelling.

Habitat distribution models for most threatened species can be accessed via DEECA's NatureKit tool, or downloaded through the Victorian Government Data Directory.

Conservation planning analysis

DEECA's strategic biodiversity values analysis combines multiple habitat distribution models and uses the Zonation conservation planning software to produce a hierarchical ranking of conservation value across the landscape. This process can be tailored to answer particular questions. VEAC commissioned scientists at DEECA's Arthur Rylah Institute for Environmental Research (ARI) to run this analysis to identify the state forests that are of highest value for threatened species, i.e. the places that support the largest range of forest-dependent species in the smallest area.

Biophysical data, including those used in habitat distribution modelling, can be used to further refine this synthesis. Other aspects of the analysis can also be adjusted and varied to improve the utility of the results and to test key considerations for the question under examination. Variations and adjustments in the VEAC-ARI analysis included:

1. The use of only forest-dependent species. The analysis used habitat distribution models for only the 49 forest-dependent species listed in table 3.1. This avoided distortions of the final product caused by the inclusion of, for example, wetland-dependent species which would dilute the value ascribed to important forest locations by elevating the value ascribed to wetlands remote from the state forest areas that are the focus of VEAC's Central Highlands assessment. Note that the forest-dependent species list includes aquatic plant and animals found in the forested waterways of the Central Highlands. This has been a standard adjustment for strategic biodiversity value analyses for several years.
2. Focus on public land outside existing protected areas. The ultimate purpose of VEAC's Central Highlands assessment is to inform decisions about public land use categories in the Central Highlands and to identify which areas have values most strongly indicative of addition to Victoria's protected areas system. Existing protected areas have therefore been excluded from the analysis.
3. Connectivity and forest stand age. Scientists at ARI have built in options to identify the effects of some likely key factors in the analysis – such as to increase the connectivity between areas of high value, or to examine the role of the modelled age of forest stands ('tree age'). The inclusion of the tree age dataset has provided some useful insights into the occurrence of threatened species in the Central Highlands, as described below.

Locations for threatened species

Figures 3.1 and 3.2 show the synthesised results of ARI's zonation analysis for VEAC, with and without tree age taken into account. The map without tree age (figure 3.2) shows:

1. The largest area of highest value for threatened species from west of Powelltown and Warburton east to Tanjil Bren and to the southeast of Noojee.
2. A little further east, another area of highest value for threatened species on the southwest and northeast facing slopes of the Baw Baw Plateau. The rest of Thomson River catchment – north to around Matlock is also of high value, albeit somewhat less so than forests closer to the plateau.
3. Between the two highest-value areas above is an area of variable but generally somewhat lower value. The value of this area for threatened species tends to increase heading north from its southern end east of Blue Rock Lake, such that north of Tanjil Bren the area is comparable to the two abutting highest value areas to the west and east.
4. Another large area of highest value forests extends from the Melba Highway west of Toolangi, through the Black Range, beyond the plantations and farmland of the middle Acheron valley, north to near Eildon and east to the Torbreck and upper Big rivers northeast of Cambarville. High value areas extend up to the head of the Acheron valley and over the divide and Yarra Ranges National Park to the catchments of Webster Creek and Cement Creek East Branch which flow into the Yarra.
5. Several waterways flowing north into Lake Eildon show as narrow, high value strips closely following the waterways through otherwise lower value areas. The relevant waterways are the Taponga River and the Big River and its major tributaries: the Torbreck River and Springs, Arnold and Frenchmans creeks. The Goulburn, Jamieson and Howqua rivers are similarly apparent further east in the North East RFA area but note that the high value waterways of the Upper Goulburn River near Woods Point and Stander Creek (a nearby tributary from the east) are entirely in the Central Highlands RFA downstream to the Black River confluence from where the RFA boundary follows the river downstream to the Gaffneys Creek confluence at Knockwood (about 12 kilometres in a straight line).
6. Apart from the waterways described above, the eastern two-thirds of the Big River catchment and the Goulburn catchment through to the eastern edge of the RFA boundary, south to near Matlock and north to Lake Eildon National Park is of lower value for threatened species than the preceding areas.
7. The lowest value areas for threatened forest-dependent species are the patches of forests near Tallarook, Mount Disappointment and further to the east Mount Robertson. These generally drier forests may have had higher relative value if species more characteristic of the drier forests and woodlands further north were included in the analysis.

Table 3.1 Forest-dependent threatened species used to identify priority areas for threatened species

Species names	Conservation status in Victoria*	Conservation status in Australia#
Tall astelia Astelia australiana	endangered	vulnerable
Baw Baw frog *Philoria frosti*	critically endangered	critically endangered
Broad-toothed rat *Mastacomys fuscus mordicus*	vulnerable	vulnerable
Giant burrowing frog *Heleioporus australiacus*	critically endangered	vulnerable
Glossy black-cockatoo *Calyptorhynchus lathami*	critically endangered	vulnerable
Southern greater glider *Petauroides volans*	vulnerable	endangered
Colquhoun grevillea *Grevillea celata*	critically endangered	vulnerable
Watson's tree frog *Litoria watsoni*	critically endangered	endangered
Leadbeater's possum *Gymnobelideus leadbeateri*	critically endangered	critically endangered
Long-footed potoroo *Potorous longipes*	endangered	endangered
Smoky mouse *Pseudomys fumeus*	endangered	endangered
Spot-tailed quoll *Dasyurus maculatus maculatus*	endangered	endangered
Spotted tree frog *Litoria spenceri*	critically endangered	critically endangered
Yellow-bellied glider *Petaurus australis*		vulnerable
Elegant daisy *Brachyscome salkiniae*	vulnerable	
Forest sedge *Carex alsophila*	endangered	
Native hemp *Androcalva rossii*	critically endangered	
Mallacoota burrowing crayfish *Engaeus mallacoota*	critically endangered	
East Gippsland spiny crayfish *Euastacus bidawalus*	vulnerable	
Clayton’s spiny crayfish *Euastacus claytoni*	endangered	
Orbost spiny crayfish *Euastacus diversus*	endangered	
Variable spiny crayfish *Euastacus yanga*	endangered	
Gippsland stringybark *Eucalyptus mackintii*	vulnerable	
Dargo galaxias *Galaxias mungadhan*	critically endangered	
East Gippsland galaxias *Galaxias aequipinnis*	critically endangered	
McDowall's galaxias *Galaxias mcdowalli*	critically endangered	

Species names	Conservation status in Victoria*	Conservation status in Australia#
Roundsnout galaxias *Galaxias terenasus*	critically endangered	
'Yalmy' galaxias *Galaxias* sp. 14	critically endangered	
Gully grevillea *Grevillea barklyana*	critically endangered	
Oval-leaf grevillea *Grevillea miqueliana* subsp. *miqueliana*	endangered	
Outcrop guinea-flower *Hibbertia hermanniifolia* subsp. *recondita*	vulnerable	
Brown guinea-flower *Hibbertia rufa*	vulnerable	
Toothed leionema *Leionema bilobum serrulatum*		
Masked owl *Tyto novaehollandiae*	critically endangered	
Tree geebung *Persoonia arborea*	endangered	
Smooth geebung *Persoonia levis*	endangered	
Forest geebung *Persoonia silvatica*	endangered	
Velvety geebung *Persoonia subvelutina*	endangered	
Forest phebalium *Phebalium squamulosum* subsp. *squamulosum*	endangered	
Tasmanian wax-flower *Philotheca virgata*	endangered	
Veined pomaderris *Pomaderris costata*	endangered	
Eastern pomaderris *Pomaderris discolor*	endangered	
Upright pomaderris *Pomaderris virgata*	critically endangered	
Powerful owl *Ninox strenua*	vulnerable	
Serpent heath *Richea victoriana*	endangered	
Sooty owl *Tyto tenebricosa*	endangered	
Leafless pink-bells *Tetratheca subaphylla*	vulnerable	
Baw Baw berry *Wittsteinia vacciniacea*	vulnerable	
Sandfly zieria *Zieria smithii*	endangered	

*Conservation status in Victoria: the category of threat for each species as listed under the Victorian *Flora and Fauna Guarantee Act 1988* as of October 2023.

#Conservation status in Australia: the category of threat for each species as listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Effect of tree age

Older trees are key habitat features for many threatened forest fauna. In general, areas that have not been harvested or have limited harvesting, or have not experienced a recorded wildfire, have greater tree age. Timber harvesting has occurred across the state forests of the RFA area (with a focus on high value merchantable forest types) but the intensive and extensive fires of Black Saturday in February 2009 have been the dominant factor influencing the value of large areas of state forest for wildlife dependent on tree hollows and mature forest dependent over the last 10–15 years. This is apparent on the map of the zonation output with tree age included (figure 3.1). Long-term forest planning should identify areas that are capable of supporting older trees and the threatened fauna dependent on them. A second map (figure 3.2) shows the zonation output with tree age excluded. While the two maps show a similar general pattern, the key difference when tree age is included is generally lower values in the intensively burnt areas: for example, the Blue and Black Ranges northeast and northwest of Marysville and all unburnt areas also show slightly higher relative value.

This comparison requires some interpretation. Essentially, it reveals that the areas with less wildfire in recent decades (of the intensity that results in tree death and stand replacement) are important for threatened species conservation in the next few decades and beyond, and that the other areas of high value but currently low tree age will become more important unless they are subject to intense fire again. Species that require older trees will need suitable habitat in the next few decades and beyond if they are to persist long term, and planning to provide that habitat should be conservative given the time required for old trees to develop and the recent and likely future increased frequency of intensive and extensive wildfire.

Figure 3.1 Threatened species Zonation output for the Central Highlands with adjustment for tree age

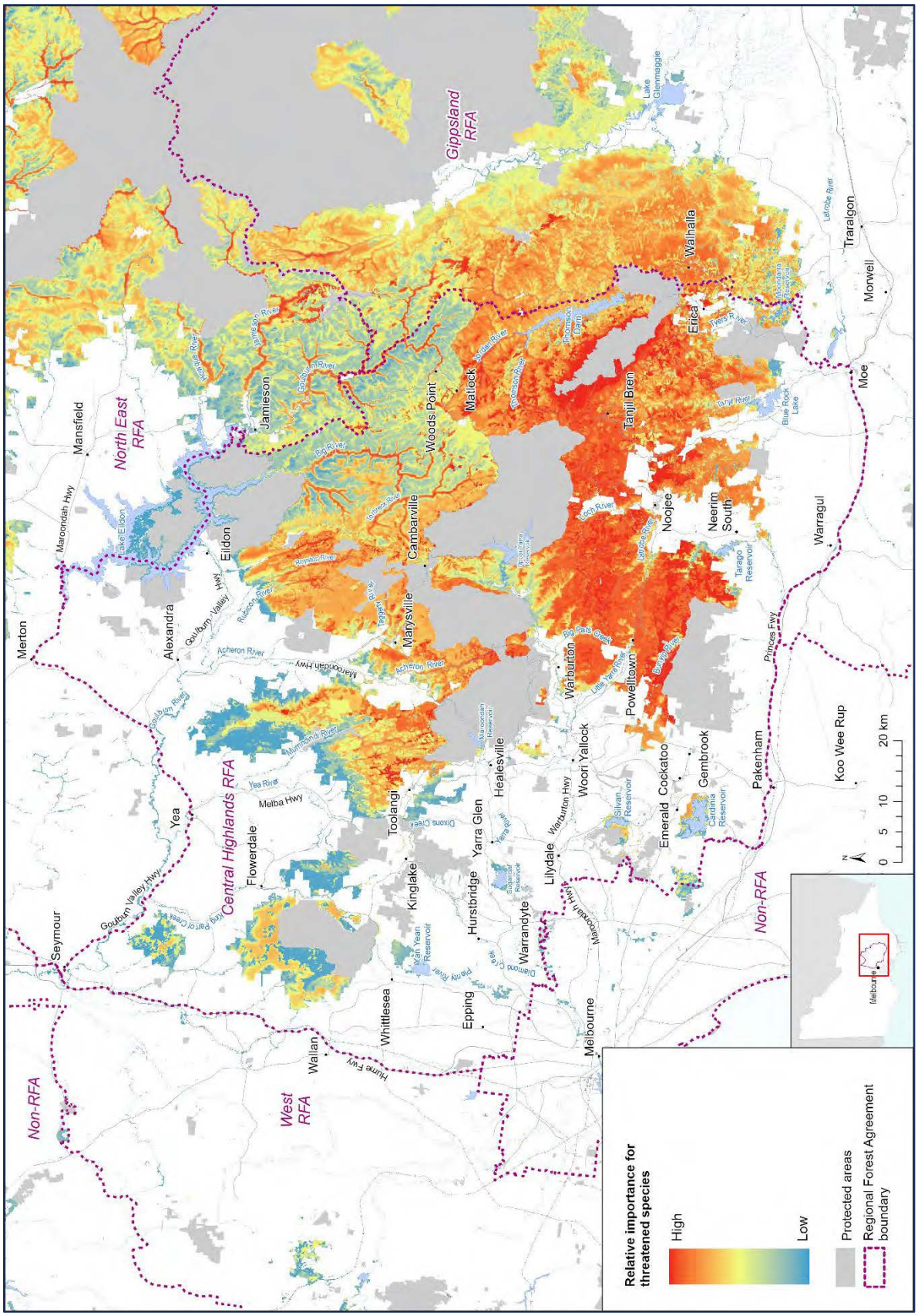
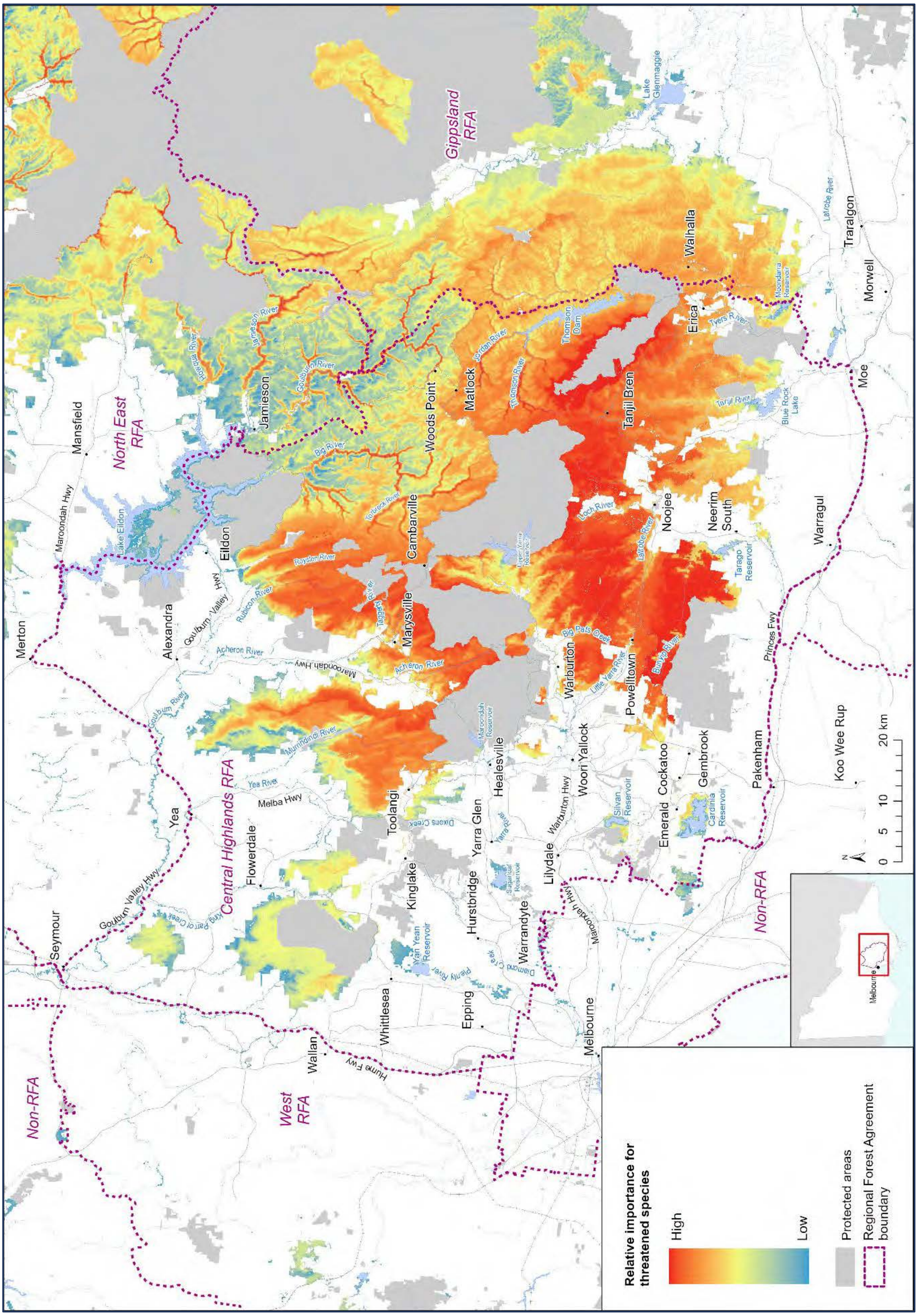


Figure 3.2 Threatened species Zonation output for the Central Highlands without adjustment for tree age



3.1.2 Ecosystems

A key component of conservation planning for public land is the need to provide for a protected area system – comprising national, state and conservation parks, and nature and bushland reserves – which addresses the national and state targets for comprehensiveness, adequacy and representativeness (see section 1.9). These targets are set at the ecosystem level and, in Victoria, Ecological Vegetation Classes (EVCs) are used as ecosystem surrogates. EVCs are the standard unit for classifying vegetation types in Victoria. They are described through a combination of floristics, lifeforms and ecological characteristics, and through an inferred fidelity to particular environments. More information is available from the DEECA website.

The map available in supplementary material online shows the current extent of the 152 EVCs across the Central Highlands RFA area. The table in the supplementary material presents the extent in hectares of each of these EVCs as well as the conservation status and protected area shortfall of each EVC; the shortfall is the area of public land that would need to be added to the existing protected area system for an EVC to meet the nationally agreed targets.

As part of its Statewide Assessment of Public Land (2017) VEAC evaluated Victoria's terrestrial protected area system against the nationally agreed criteria, and this approach has been applied to the Central Highlands RFA area to identify those EVCs which currently do not meet the targets, and the extent of the consequent shortfalls. The shortfall for a given EVC is a percentage of the public land potentially available to improve representation (i.e. public land other than that already in protected areas) for each bioregional EVC within the area of interest, in this case the Central Highlands RFA. This percentage is taken as the same as that for the respective bioregional EVC across the entire extent of the bioregion in Victoria, as derived for the 2017 statewide assessment. The rationale is that ecosystem (EVC) representation should be generally spread across the distribution of that ecosystem in each bioregion. A shortfall of 100 per cent means that all public land areas where such an EVC occurs should be in protected areas if this can be reconciled with other public land uses and potential management issues such as the management viability of small or narrow public land areas.

Figure 3.3 is a version of the EVC map in Supplementary Material 2, but instead of being coloured to show each individual EVC, it is coloured to show the extent of the EVC shortfalls. There are two key parameters to characterise the extent of EVC shortfall:

- Absolute extent. The absolute sizes (in hectares) of the shortfalls for various EVCs in the Central Highlands RFA area range from zero (no shortfall) to 2917 hectares for Lowland Forest in the Highlands – Southern Fall (HSF) bioregion. For the strategic public land planning exercise which VEAC's assessment is to inform, larger shortfall areas are higher priorities to address than smaller ones.
- Proportion of what is available. Effectively, protected area shortfalls can only be met from areas where the EVC under consideration occurs on public land outside existing protected areas; this can be from a number of public land use categories but, in the Central Highlands RFA area, is overwhelmingly from state forest. For some EVCs, 100 per cent of the areas where it occurs in state forest would be needed to meet the protected area target, providing providing limited capacity to balance competing considerations if the target is to be met. For another EVC, though, the shortfall extent may be a small proportion of its occurrence in state forest; the HSF Lowland Forest example from the previous paragraph is a good example here. Although the absolute extent of the shortfall is large (2917 hectares) there are 14,086 hectares of that bioregional EVC outside protected areas, so only 20.7 per cent of the area of the EVC on other public land would be required to meet the target. By way of contrast, the EVC with the second-largest absolute extent of shortfall (Cool Temperate Rainforest in the Victorian Alps; 2845 hectares shortfall) would need all of that area added to protected areas to meet the target. There is a high level of irreplaceability and therefore priority. EVCs with higher shortfall percentages are higher priorities than those with smaller ones that would be more easily met.

The shading in figure 3.3 shows the priorities of bioregional EVC shortfalls from the highest (both absolute extents and proportion of what is available are high) to the lowest (both low) with interrelated intermediate priorities decreasing as one or other, and eventually both, of the key parameters decrease.

Viewed through the lens of these key parameters, the long list of bioregional EVCs in the Central Highlands (see supplementary material available online) can be simplified as follows:

- 97 of the bioregional EVCs have a total shortfall area of less than 10 hectares and can be excluded from further consideration at the strategic level of VEAC's assessment.
- Of the remaining 55 higher shortfall EVCs, 38 are located almost completely outside the state forests. Nearly all are in small patches or along narrow strips (especially riparian strips) within the heavily cleared landscapes that surround the north, west and south sides of the main forest blocks of the RFA area. Although there is little public land in these landscapes, it is very important that protected area representation of these ecosystems is improved. However, the focus of this assessment is on state forests of the mountains and their EVCs.
- This leaves 17 bioregional EVCs as the focus of this assessment as listed in table 3.2. Of these, three stand out in having large absolute shortfall areas (greater than 2000 hectares) that comprise 100 per cent of the extent of those EVCs outside existing protected areas. For each of them, all of a relatively large area would need to be made protected areas to meet the targets; there is no flexibility to choose between different patches of these EVCs. They are all Cool Temperate Rainforests, occurring in three different bioregions: Victorian Alps (visible in figure 3.3 as branching riparian networks near Lake Mountain, and the Baw Baw and Toorongo Plateaus), Highlands – Southern Fall (east, especially northeast, of Powelltown) and Highlands – Northern Fall (upper Acheron valley, northeast of Toolangi, and east and southeast of Marysville).
- The remaining 14 EVCs have smaller absolute shortfall areas or shortfall percentages of extent outside protected areas, well below 100 per cent. Many of them (a. to e. in the list below) occur near the periphery of the large forest blocks often as the only remaining substantial areas of EVCs heavily cleared from the now agricultural landscapes on the lower slopes and flats beyond the public forests. Even if small, they are high conservation priorities. A further four of these remaining EVCs occur at high elevation, mostly near Lake Mountain but also peripheral to Baw Baw National Park (f. to i. below). The remaining five EVCs (j. to n. below) occur in relatively small areas, sometimes very small, in particular landscapes, except for Lowland Forest (l. below) which occurs over large areas of the Latrobe and Tanjil state forests in the Highlands – Southern Fall, and Riparian Forest in the Highlands – Northern Fall (m. below) which occurs in narrow riparian strips over relatively large parts of that bioregion. The list of these 14 EVCs is as follows:

  a. Grassy Dry Forest in the Central Victorian Uplands

  b. Herb-rich Foothill Forest in the Central Victorian Uplands

  c. Grassy Dry Forest in the Highlands – Northern Fall

  d. Valley Grassy Forest in the Highlands – Northern Fall

  e. Damp Forest in the Central Victorian Uplands

  f. Montane Riparian Thicket in the Highlands – Northern Fall

  g. Sub-alpine Wet Heathland/Alpine Valley Peatland Mosaic in the Victorian Alps

  h. Sub-alpine Wet Heathland in the Victorian Alps

  i. Riparian Thicket in the Highlands – Northern Fall

j. Shrubby Foothill Forest in the Highlands – Northern Fall

k. Riparian Thicket in the Highlands – Southern Fall

l. Lowland Forest in the Highlands – Southern Fall

m. Riparian Forest in the Highlands – Northern Fall

n. Montane Grassy Woodland in the Highlands – Southern Fall

The area required to meet protected area representation criteria (i.e. remove the shortfall) is about 3.4 per cent of the total extent of state forest in the RFA. However, even before considering other factors such as threatened species, there are at least two reasons to expect a comprehensive, adequate and representative suite of protected areas for the RFA area to be larger than this 3.4 per cent figure:

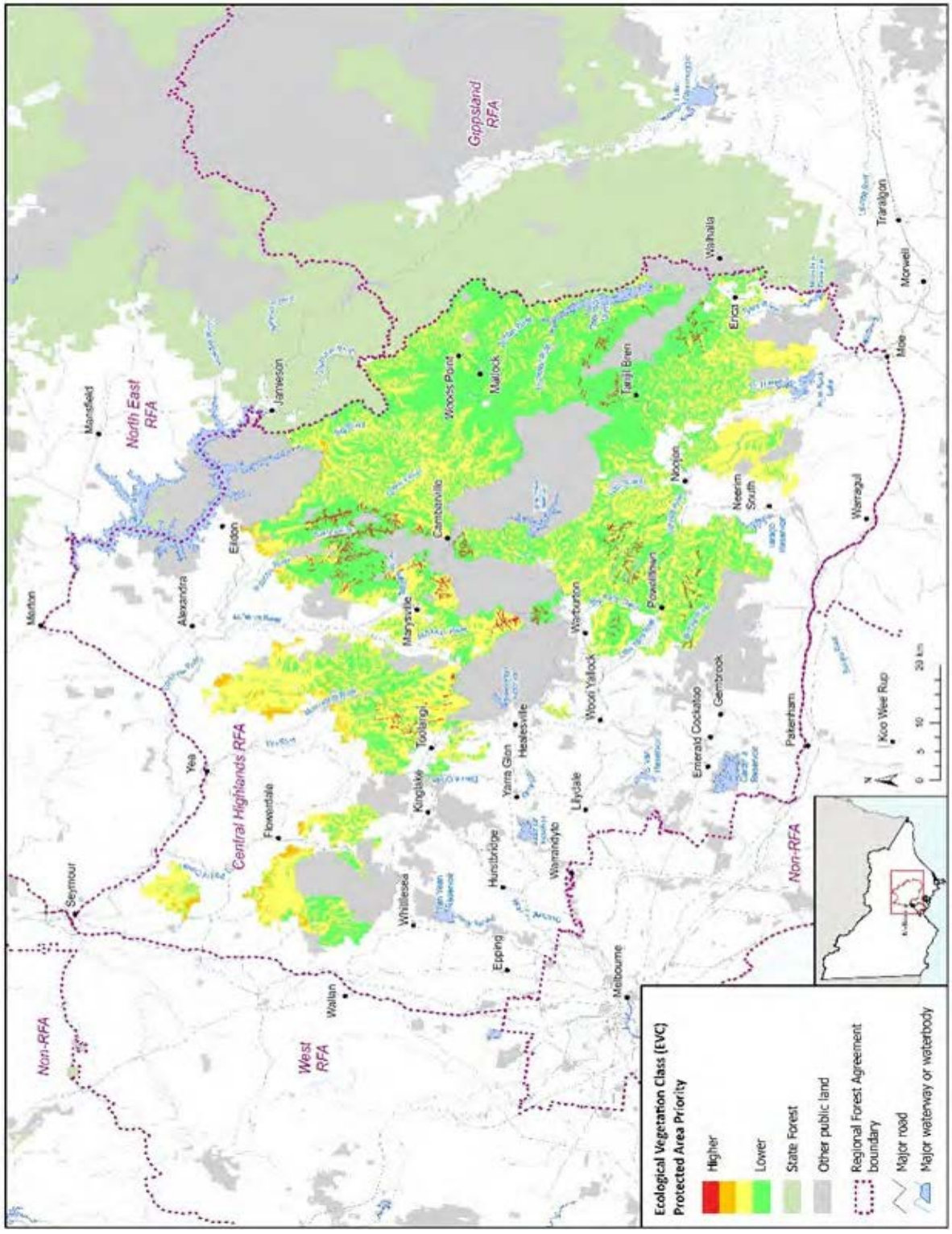
- Many of the under-represented EVCs occur in multiple scattered patches and it would be impractical and inefficient to restrict new protected areas to just the mapped area of these EVCs. To do so would also be based on much greater a level of precision than that used for the actual mapping of EVCs. A more practical and adequate protected area system would combine these patches with adjoining vegetation types into more consolidated and robust units.
- In the absence of a broader assessment, it is not possible to properly evaluate the condition or quality of the patches of under-represented EVCs in the Central Highlands compared to occurrences of these EVCs elsewhere in the respective bioregions that might also be potential protected area additions. In the first instance, though, the forests of the Central Highlands are widely considered to be of at least good condition in general.

Table 3.2 Protected area representation shortfalls for the 17 key Ecological Vegetation Classes (EVCs) of the Central Highlands RFA area

Ecological Vegetation Class (EVC) and bioregion name[1]	Shortfall area (ha)[2]	Shortfall as % of available[3]
EVCs with highest priority for protected area addition in VEAC's assessment		
Cool Temperate Rainforest VA	2,845.15	100.00
Cool Temperate Rainforest HSF	2,295.68	100.00
Cool Temperate Rainforest HNF	2,096.09	100.00
EVCs of high priority for protected area addition in VEAC's assessment: occur on the periphery of large forest blocks, often as remnants of heavily cleared EVCs in now-agricultural landscapes		
Grassy Dry Forest CVU	595.28	48.04
Herb-rich Foothill Forest CVU	401.64	57.14
Grassy Dry Forest HNF	320.75	8.54
Valley Grassy Forest HNF	33.74	75.44
Damp Forest CVU	55.00	19.50
EVCs of high priority for protected area addition in VEAC's assessment: occur at high elevation peripheral to Baw Baw National Park and, especially, Lake Mountain		
Montane Riparian Thicket HNF	56.40	100.00
Sub-alpine Wet Heathland/Alpine Valley Peatland Mosaic VA	22.71	100.00
Sub-alpine Wet Heathland VA	13.86	100.00
Riparian Thicket HNF	143.86	29.28
EVCs of high priority for protected area addition in VEAC's assessment: various patterns of occurrence		
Shrubby Foothill Forest HNF	510.84	53.90
Riparian Thicket HSF	61.88	100.00
Lowland Forest HSF	2,916.94	20.71
Riparian Forest HNF	757.47	8.23
Montane Grassy Woodland HSF	12.08	62.43

1. Bioregion abbreviations: CVU = Central Victorian Uplands; GP = Gippsland Plain; HNF = Highlands – Northern Fall; HSF = Highlands – Southern Fall; SR = Strzelecki Ranges; VA = Victorian Alps; VR = Victorian Riverina; VVP = Victorian Volcanic Plain
2. Shortfall area (ha) = the area in hectares that would be required from public land outside current protected areas in order for the RFA area to meet the nationally agreed protected area representation targets
3. Shortfall as % of available = the shortfall area (ha) as a percentage of the area of public land outside current protected areas from which that shortfall could be met

Figure 3.3 EVC shortfall categories



3.2 Geological and geomorphological values

3.2.1 Geological overview of the Central Highlands

The state forests within the Central Highlands RFA area are primarily situated in the Eastern Victorian Uplands Geomorphic Division. Known more generally as the Eastern Uplands, this is the largest and most diverse geomorphic region in Victoria with steep ridges, narrow valleys and high plateaus. The Eastern Uplands straddle the central divide which separates northward-flowing rivers such as the Goulburn, which feed into the Murray-Darling Basin, from those that flow southward into the sea including the Yarra, Latrobe and Bunyip rivers (figure 3.4). The geology here is dominated by the Palaeozoic Lachlan Fold Belt largely comprising folded and faulted Ordovician to Early Devonian marine sedimentary rocks and Middle to Late Devonian intrusive rocks.

Although the most renowned peaks of Victoria's highlands, such as Mounts Hotham, Bogong (Victoria's highest peak), Feathertop and Buller, are located east of the Central Highlands RFA area, the region itself showcases a variety of landforms. These include mountain ridges, extensive plateaus at various elevations, and deep valleys. At 1567 metres above sea level (asl), the highest point in the Central Highlands RFA is Mount Baw Baw. Other prominent peaks include Mounts Torbreck (1516 masl), Bullfight (1483 masl), Donna Buang (1250 masl), Saint Leonard (1034 masl), Disappointment (810 masl), and Lake Mountain (1433 masl).

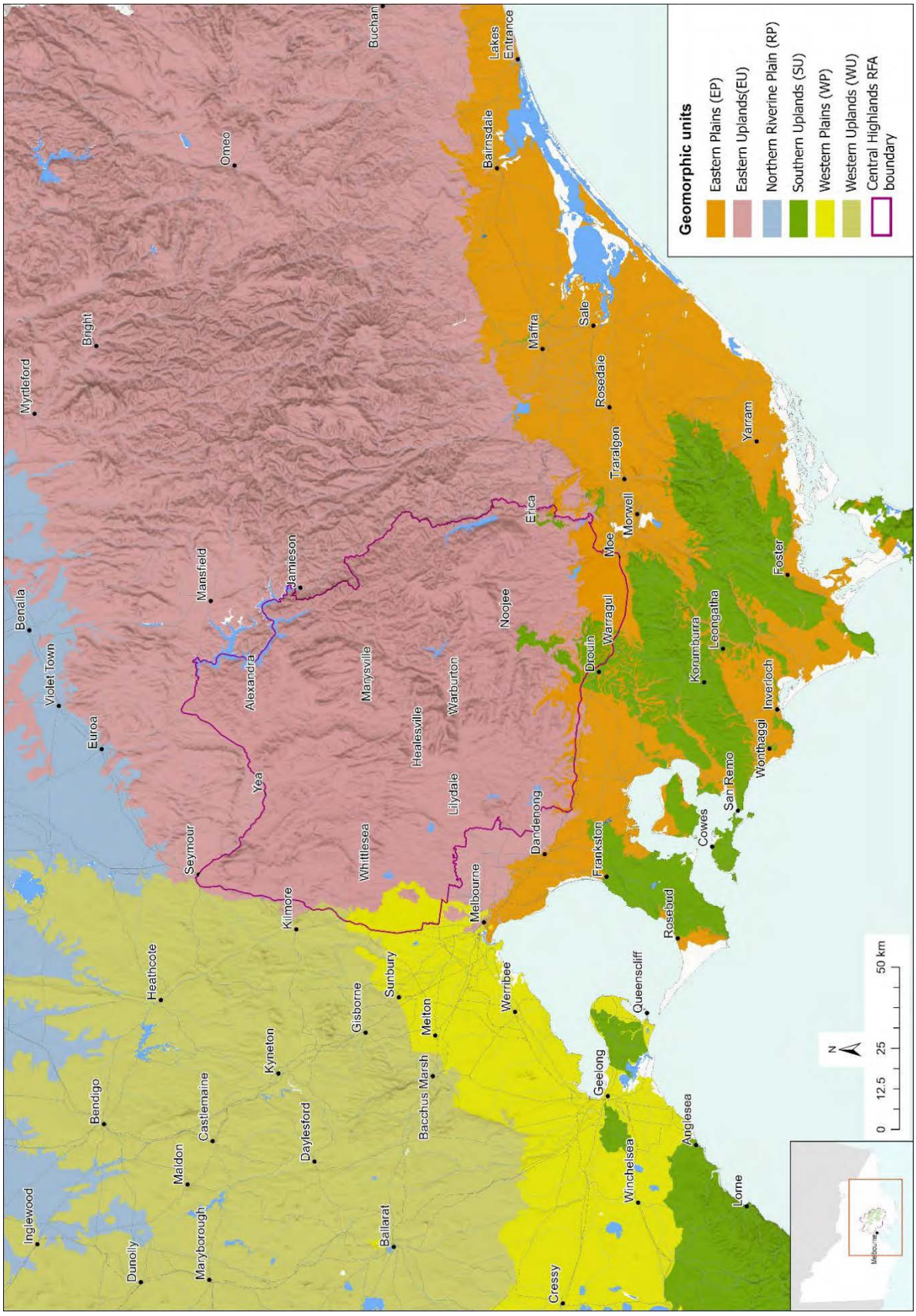
This dissected landscape largely comprises Lower Palaeozoic folded sedimentary and metamorphic rocks (~550–418 million years) and Early Devonian rhyolite and sandstones (~380–350 million years). Late Devonian granites are widely scattered in the northern part of the RFA area. In the south, an almost continuous band of granitic rocks extends from the Dandenongs in the west an culminates with the Baw Baw Plateau in the far east of the RFA area. Mount Disappointment and the Black Range north of Toolangi are other areas of Devonian granite.

A major feature of the Central Highlands are the Devonian Acheron and Cerberean Cauldrons where, some 370 million years ago, the surface sandstone rocks collapsed into two large and shallow magma chambers. The resulting structures are two 20- to 30-kilometre diameter cauldrons comprising mostly granodiorite and rhyodacite. Around the fringes more complex features are observed arising from the movement of magma and rocks around the edge of the collapsing structures. The Cathedral Range forms a ridge of sandstone along the western edge of the Cerberean Cauldron.

The other notable igneous geology of the Central Highlands are small areas of Older Volcanics basalt located east of the Dandenongs and south of Noojee (~20–30 million years ago). Near Melbourne the Central Highlands RFA area includes occurrences of Cainozoic Newer Volcanics basalt (~5 million years to 10,000 years ago) on the plains, but state forests are largely confined to the elevated treed landscapes. Throughout the region unconsolidated Cainozoic sedimentary rocks occur along drainage lines.

A belt of gold mineralisation extends from Walhalla to Woods Point. Mineralisation is associated with quartz reefs deposited in shears or fractures in the Devonian Walhalla Group sedimentary rocks and follows the intrusion of the Woods Point Dyke Swarm in the mid Devonian (~375 million years).

Figure 3.4 Geomorphic units in the Central Highlands RFA area



3.2.2 Geological and geomorphological sites of international, national and state significance

Over 200 geological and geomorphological sites of significance were identified in the Central Highlands RFA area from available information compiled by Wakelin Associates for VEAC (see supplementary material available online).[26] Of these, 13 were assessed as having high significance, comprising one international, one national and 11 state significant sites (table 3.3, figure 3.5, supplementary material available online).

Table 3.3 lists the known sites of international, national and state geological and geomorphological significance in the Central Highlands state forests. These sites represent specific characteristics of the region, or demonstrate outstanding, rare or unique geological or geomorphological features. Detailed site descriptions and statements of significance for each site of international, national, and state importance are provided in supplementary material available online and the report prepared by Wakelin Associates for VEAC.

Table 3.3 Sites of international, national and state geological and geomorphological significance in Central Highlands state forests

Site ID	Name	Location	Significance
WR 092	Sekaninaite mineral occurrence	Marysville	International
WR 014	Baw Baw Plateau	Erica	National
WR 014.06	Marshall Spur Road quarry: contact Metamorphosed shale	Road metal quarry on west side of Marshall Spur Rd	State
WL 017	Labertouche Cave	11 km north of Princes Hwy at Robin Hood	State
WR 013	Acheron Cauldron area	Mt Donna Buang area	State
WR 013.02	Marysville to Cumberland Junction road cuttings	Marysville	State
WR 015	Cerberean Cauldron	Marysville	State
WR 017	Enochs Point Ordovician fauna	Enochs Point	State
WR 019	Matlock fossil localities	Matlock	State
WR 020	Woods Point dyke swarm Site 1	Woods Point	State
WR 064	Frenchman Gully Peridotite	3 km NNW of Aberfeldy, 2.5 km NE of Violet Town	State
WR 065	Mount Easton area	7 km west of Aberfeldy	State
WR 094	Jordan River Group: Mt Easton area; Reference no: 37 Jericho	Pinnacle Track	State

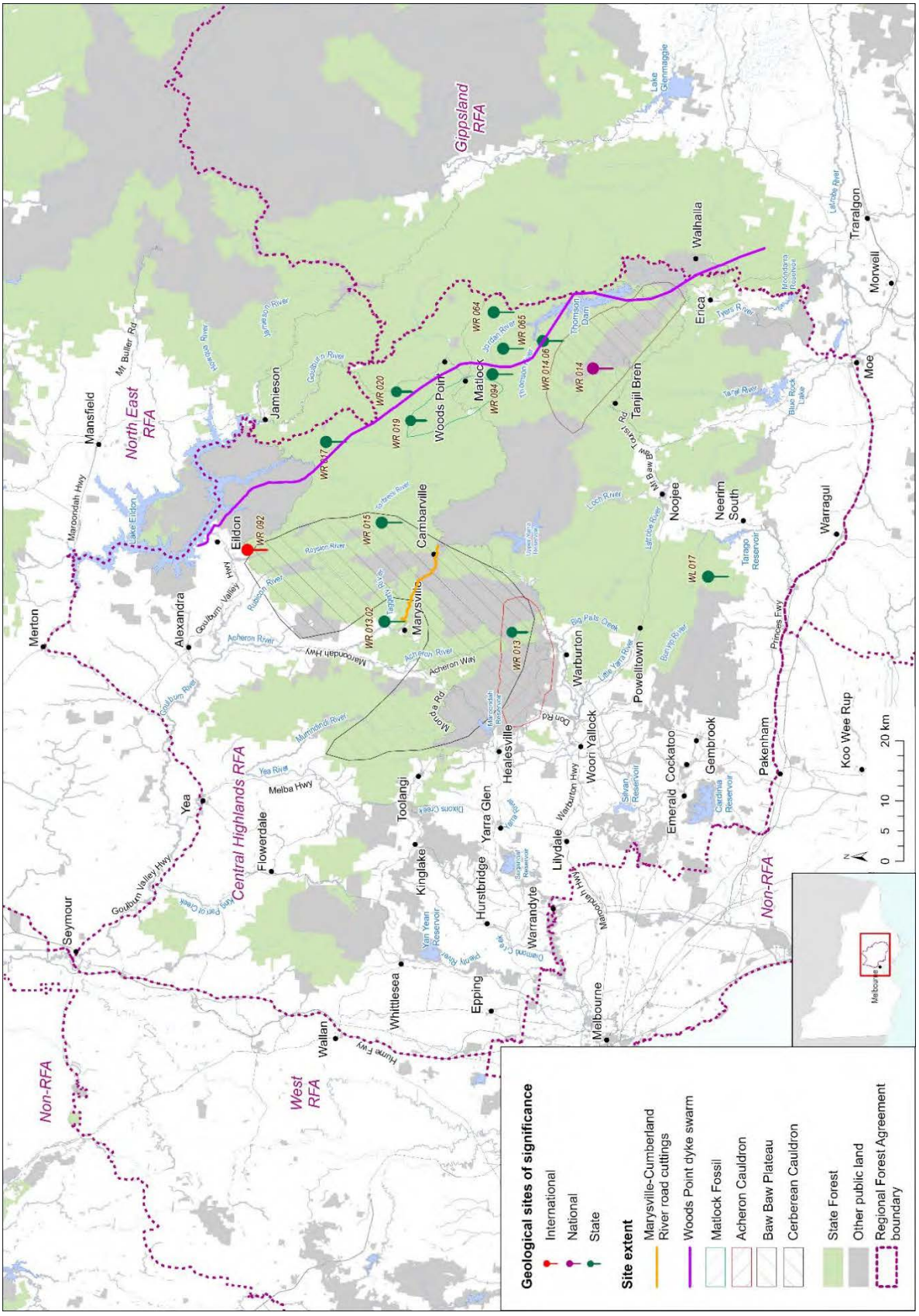
Limited work has been undertaken to document geological and geomorphological sites of significance in the extensive native forests of the Central Highlands largely due to limited accessibility. Therefore, more sites have been identified in the western area where there is better road access. The available literature on known sites is limited and outdated, with publications dating back over 30 years, impacting comparative aspects of significance assessments. Additionally, location data, if available, is often imprecise, as many sites were recorded prior to the advent of

26 Sites identified as 'unassigned' significance have not been assessed by Geological Society of Australia (GSA) (Victoria Division) and are not included here.

GPS technology. Also detailed location information is rarely published for vulnerably sites such as fossil or mineral locations. Consequently, the precision of site locations varies, and some fieldwork is required to verify the location of some sites.

Several of the sites identified are very large and robust (e.g. Acheron and Cerberean cauldrons, Baw Baw plateau). Many other significant geological and geomorphological sites face threats, including human activities such as industrial use, development and tourism, which can in some cases lead to alteration or destruction. Conservation efforts for sites of high significance may assist in mitigating these threats and preserve their scientific, cultural, and environmental value.

Figure 3.5 Geological and geomorphological sites of international, national and state significance in Central Highlands state forests



3.3 Water supply catchments

The Central Highlands forests grow in some of the most important water supply catchments in Victoria. As well as providing high quality drinking water for millions of people in Melbourne and numerous towns across the region and beyond, they also contribute a significant volume of the water flowing into the Gippsland Lakes and into Lake Eildon and downstream on the Goulburn and its tributaries such as Big River. As a result, water from the Central Highlands delivers environmental, social and economic benefits over an extensive area from Lakes Entrance to the Coorong in South Australia. Across this area it sustains major industries associated with irrigation, diverse and species-rich aquatic, riparian and floodplain ecosystems with many threatened species, and recreational activities such as fishing and boating concentrated at key locations (e.g. lakes) and dispersed along the waterways.

To protect these values and uses, particularly the valuable high-quality drinking water, key catchments have been identified and declared so that specific protection measures can be applied.

Melbourne Water

The total area of Melbourne's water supply catchments (mapped in figure 3.6) is around 163,000 hectares, comprising:

- 80,500 hectares in national parks, managed by Melbourne Water and Parks Victoria
- 68,500 hectares in State forests, managed by DEECA
- 7,900 hectares in Melbourne Water freehold
- 4,100 hectares in Crown land vested to Melbourne Water
- 2,000 hectares in private freehold

Parts of the water supply catchments are protected from public access to minimise water quality risks at their source. Some water comes from open catchments including farmland, rural properties and state forests that are available for activities such as camping and four-wheel driving. Melbourne Water also pumps water from the Yarra River at Yering Gorge, at the bottom of the approximately 141,000 hectares open mid-Yarra water supply catchment.

Melbourne Water catchments over state forest and other public land areas include both closed and restricted access, as well as open access (table 3.4 and figure 3.7). Closing access helps avoid contamination by reducing the activities in the catchments that pose risks to drinking water such as:

- untreatable pathogens carried by humans, livestock and pest animals
- contamination from camping and toileting
- faeces or urine from pets
- sediment from disturbing soil around the catchment
- rubbish left behind
- pollutants carried by shoes or bike tyres
- disease from animal carcasses, and
- bushfires can cause chemical and physical contamination and can also impact on the volume of water produced by water supply catchments.

Restricted access, such as in the Thomson Catchment includes seasonal road closures in place from 1 May to 30 November each year.

Table 3.4 Melbourne Water catchments over state forest and their status

Name of catchment over state forest	Status
Armstrong catchment	closed
Big Flume catchment	closed
Bunyip catchment	restricted
Cement Creek catchment	closed
McMahons Creek catchment	closed
Micks Creek catchment	closed
Starvation Creek catchment	closed
Tarago catchment (part)	restricted
Thomson catchment	restricted
Yarra catchment (part)	open

Melbourne Water manages ten major reservoirs, varying in size from 3 gigalitres (O'Shannassy Reservoir) to 1,068 gigalitres (Thomson Reservoir). The reservoirs and their sources are listed in the table 3.5 and shown in figure 3.7. The Greenvale Reservoir is located west of the RFA boundary near Tullamarine; however, water is supplied from the forested upper catchments in the Central Highlands via Silvan Reservoir. Some of the reservoirs are on-stream, meaning their water comes from rivers or rainfall run-off from the nearby catchment. Other reservoirs are off-stream meaning they are supplied by pipelines from the on-stream reservoirs and other sources.

Melbourne Water (and the former Port Phillip and Western Port Catchment Management Authority) have published several strategies and plans for healthy catchments, waterways and drinking water.

Table 3.5 Melbourne's major water storage reservoirs

Dam	Water source	Supplies	Capacity (GL*)
On-stream			
Thomson	Thomson State Forest and a small part of Baw Baw National Park	Upper Yarra Reservoir	1,068
Upper Yarra	Yarra Ranges National Park, Thomson Reservoir	Silvan Reservoir	200
Tarago	Bunyip State Forest	Melbourne's southeast	37
Yan Yean	Toorourrong catchment, Silver and Wallaby Creeks catchment, Silvan Reservoir, Sugarloaf reservoir	Melbourne's north	30
Maroondah	Watts River catchment and Graceburn Creek	Sugarloaf Reservoir	22
O'Shannassy	O'Shannassy River and Smith Creek	Silvan Reservoir	3

Dam	Water source	Supplies	Capacity (GL*)
Off-Stream			
Cardinia	Silvan Reservoir, Victorian Desalination Plant	Melbourne's southeast, Silvan Reservoir	287
Sugarloaf	Maroondah Reservoir, North-South Pipeline, mid-Yarra Catchment	Melbourne's north, east and centre	96
Silvan	Upper Yarra, O'Shannassy and Thomson reservoirs	Most of Melbourne	40
Greenvale	Silvan Reservoir	Melbourne's northwest and west	27

* GL = gigalitres (billion litres)

Designated water supply catchments

Designated water supply catchments (DWSCs) are declared under the *Catchment and Land Protection Act 1994*. The 28 DWSCs in Central Highlands are mapped in figure 3.6 and listed in table 3.6 which shows the area of each DWSC. In total the DWSCs cover some 390,670 hectares, about 54 per cent of which are in state forest. Some smaller DWSCs that surround the Cardinia, Silvan, Sugarloaf and Yan Yean Reservoirs closer to Melbourne (figure 3.6) are not located in state forest. Some DWSCs extend into the North East and Gippsland RFA areas and the total area is shown in table 3.6.

Some Central Highlands DWSCs include forests that are catchments for the Maroondah and Upper Yarra Reservoirs and are mostly located in the Yarra Ranges National Park.

The Upper Goulburn DWSC covers large areas of state forest and forms part of the catchments of the Torbreck and Big rivers that flow into Lake Eildon.

The state forests near Noojee and south of Tanjil Bren in the Latrobe River basin have DWSCs to protect the supply for townships such as Noojee or are catchments for the Blue Rock Lake (Tanjil River DWSC) and the Moondarra Reservoir (Tyers River DWSC).

Some of the state forests in the Bunyip River basin include the Tarago River DWSC forming the catchment to the Tarago Reservoir near Neerim South.

The state forest catchments south of Matlock and east of Mount Baw Baw include DWSCs for the Thomson Dam.

National parks

While the current review focuses on areas currently in state forests, it should be noted that for adjacent areas of forest with the same water supply and biodiversity values, the *National Parks Act 1975* includes specific powers and obligations for designated water supply catchment areas and their water resources, recognising the importance of the water supply values of water supply catchments. For example, under the *National Parks Act 1975*, Parks Victoria in performing its functions in designated water supply catchments must ‘regard the paramount consideration as being the need to protect that area and maintain the water quality of and otherwise protect the water resources of that area’.

Figure 3.6 Melbourne Water supply catchments and designated water supply catchments in the Central Highlands RFA area

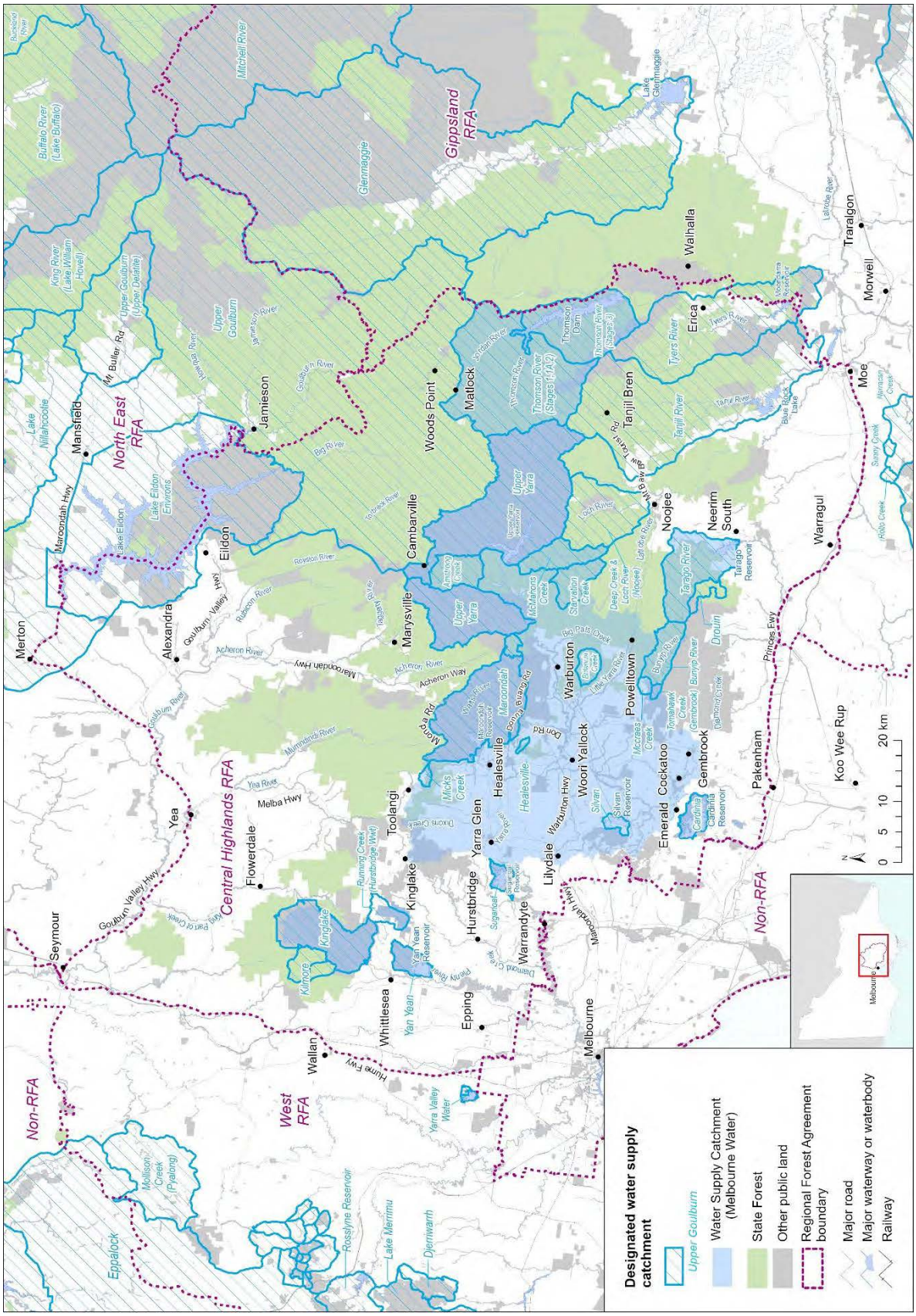


Figure 3.7 Melbourne Water catchments and their status

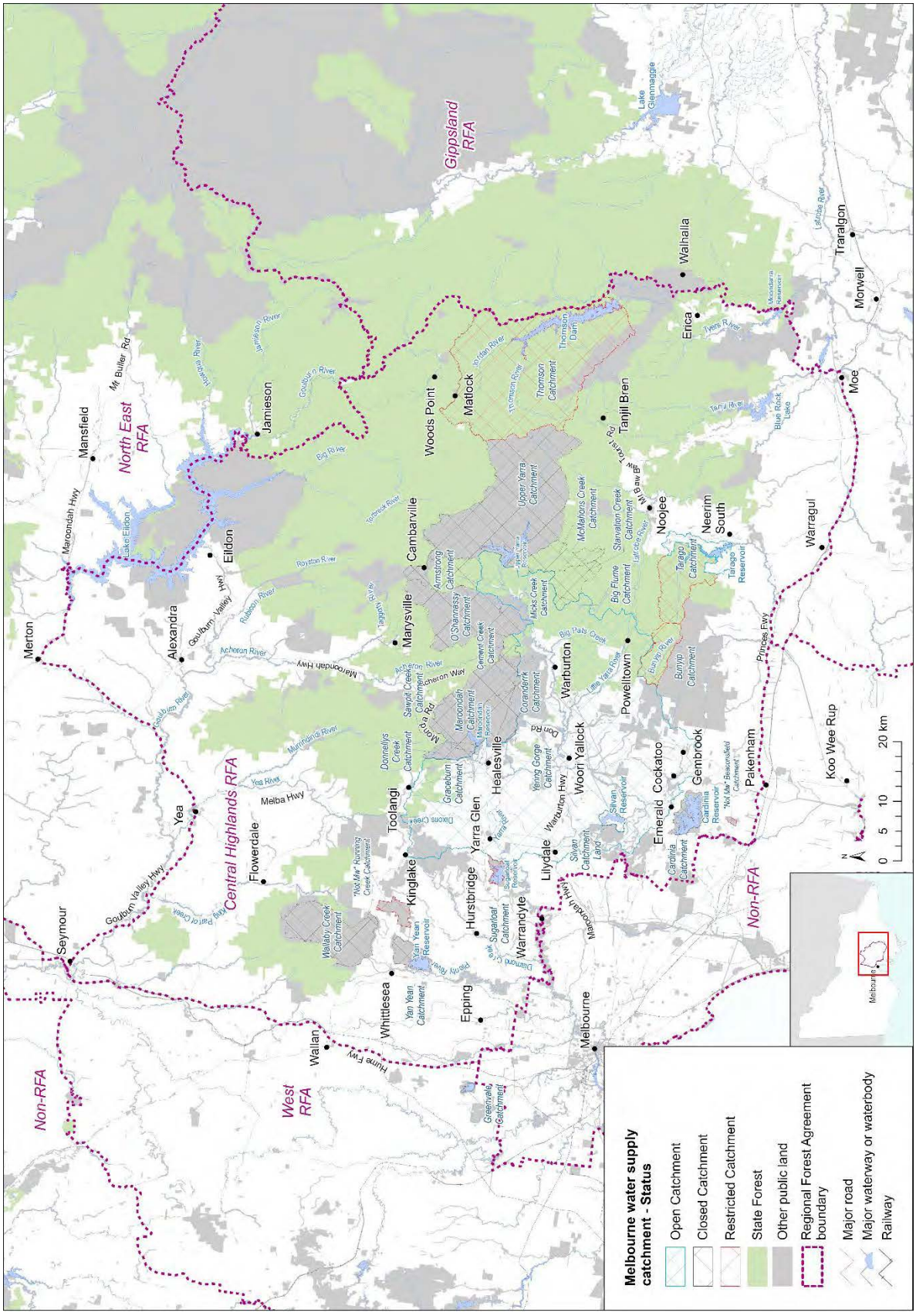


Table 3.6 Designated Water Supply Catchments in the Central Highlands RFA area

Designated Water Supply Catchments	Total area (ha)	Area in the CH RFA (ha)	Area in state forest (ha)
Kilmore	3,279	3,279	2,097
Kinglake	11,008	11,008	98
Running Creek (Hurstbridge WWT)	2,070	2,070	0
Yan Yean	2,375	2,375	0
Sugarloaf	1,321	1,321	0
Silvan	910	910	0
Micks Creek	483	483	225
Maroondah	17,937	17,937	25
Healesville	242	242	91
Armstrongs Creek	4,186	4,186	4,094
McCraes Creek	545	545	15
Upper Yarra	48,181	48,181	103
Starvation Creek	3,645	3,645	3,623
Cement Creek	808	808	802
McMahons Creek	4,425	4,425	4,385
Britannia Creek	1,819	1,819	1,805
Tarago River	11,065	11,065	7,614
Cardinia	2,554	2,554	0
Bunyip River	3,975	3,975	3,870
Tomahawk Creek (Gembrook)	317	317	2
Lake Eildon Environs *	84,783	37,733	196
Upper Goulburn *	278,996	94,754	85,417
Thomson River (Stages 1, 1A, 2) *	33,185	32,995	31,330
Thomson River (Stage 3) *	15,164	14,862	8,949
Drouin	1,426	1,426	1,099
Tyers River *	31,958	26,117	12,819
Deep Creek & Loch River (Noojee)	11,894	11,894	9,615
Tanjil River *	50,686	49,764	32,281
Total area		**390,690**	**210,555**

* Parts of these DWSC extend outside the Central Highlands RFA boundary and their total area is shown. All the other DWSC are contained with the Central Highlands RFA area.

3.4 Non-Aboriginal cultural heritage values

The following report details only non-Aboriginal history and does not address Aboriginal heritage values. The state forests of the Central Highlands RFA have a wealth of non-Aboriginal heritage values (historic sites) that reflect the region's post-contact history and provides valuable insights into past activities. This is evident through the numerous historic sites that have been recorded in the forests. The following section provides the historical background for these values.

3.4.1 Historical overview

The state forests of the Central Highlands RFA have a rich history that significantly shaped the region's landscape and development. European exploration and settlement gained momentum in the first half of the 19th century, particularly with the establishment of what is now Melbourne in 1835. The rapid expansion of pastoral activities led to extensive land clearance. By 1851, when Victoria separated from New South Wales, very few areas were untouched by Europeans, except for heavily forested regions such as those found in the Central Highlands.

The gold rushes of the 1850–60s brought a surge of immigration to the region, leading to more intensive settlement and the establishment of mining towns and camps. The discovery of goldfields in areas such as the Upper Yarra and Jordan valley (stretching from Jamieson to Walhalla) fuelled the rush, leading to significant mining activity. The Yarra Track, a famous route to the Woods Point–Jordan goldfields, had a profound impact on the region's development. It not only led to the establishment of new towns but also boosted the growth of small settlements within the area.

As the population increased, the demand for resources, particularly timber, grew. Timber cutting intensified during the gold rushes, resulting in the emergence of the timber industry as a major economic driver. Sawmills were established across the region to meet the needs of construction, mining, and fuel. The extension of the Victorian Railways system facilitated the transportation of timber to the Melbourne market. In 1937 a major paper mill was established in Marysville. The timber and mining industries have played a significant role in shaping the landscape and economy of the region – now evident in the numerous recorded historic sites closely tied to these sectors in the Central Highlands state forests.

Water supply utilities also played a crucial role in the Central Highlands' history. The completion of the Yan Yean reservoir in 1857 marked Victoria's first large-scale engineered water supply system, providing a vital water source for Melbourne and neighbouring regions. As settlements and industries grew, the demand for reliable water increased, prompting the implementation of the Maroondah scheme in 1891. Further developments included the construction of the Upper Yarra Dam and Thomson Dam in the 20th century.

The introduction of railways transformed the Central Highlands into a favoured tourist destination. Since the 1880s, places such as the Dandenongs, Marysville, Narbethong and Healesville have attracted large numbers of visitors due to their proximity to Melbourne. The rise of downhill skiing led to the establishment of Mt Baw Baw Alpine Resort by 1966, while Lake Mountain became a significant cross-country skiing destination.

The Victorian bushfires of 1939 burnt almost all the forests in the mountains of the Central Highlands and northeast Victoria. The fires claimed dozens of lives and destroyed large swathes of forests and many towns, including many very small, isolated settlements based around a small sawmill and its workforce. The subsequent Royal Commission recommended that such mills be removed from the forest and new ones not be allowed. These fires – and other landscape-scale fires, such as those in 1983 and 2009 – remain a central theme in the history of the region, underscoring the importance of the tangible cultural heritage and historic places that remain.

Throughout the 20th and 21st centuries, community views and public policy have evolved to reflect changing conservation and economic values. The work of the Land Conservation Council (LCC) led

to new and larger parks and reserves, while designating forests for timber production and other uses. Today, Central Highlands RFA state forests remain vital, offering economic, recreational, and ecological advantages to the region. The interplay between industry and the environment continues to shape the landscape.

3.4.2 Register searches

The following registers were searched to compile an inventory of recorded historic sites within the Central Highlands state forests:

- World Heritage List (WHL)
- Commonwealth Heritage List (CHL)
- National Heritage List (NHL)
- Victorian Heritage Register (VHR)
- Victorian Heritage Inventory (VHI)

Historic sites or places listed on the WHL, CHL and NHL are protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Any action that may have a significant impact on these sites or places must be referred to the Commonwealth Environment Minister. Historic sites and objects listed on the VHR and VHI are protected under the Victorian *Heritage Act 2017* (Heritage Act). Under the Act is it an offence to excavate, damage or disturb sites and relics whether or not they are included on the VHR or VHI.

World Heritage List

The WHL is a list of the world's most significant cultural and natural heritage. There are currently no WHL sites in the Central Highlands state forests.

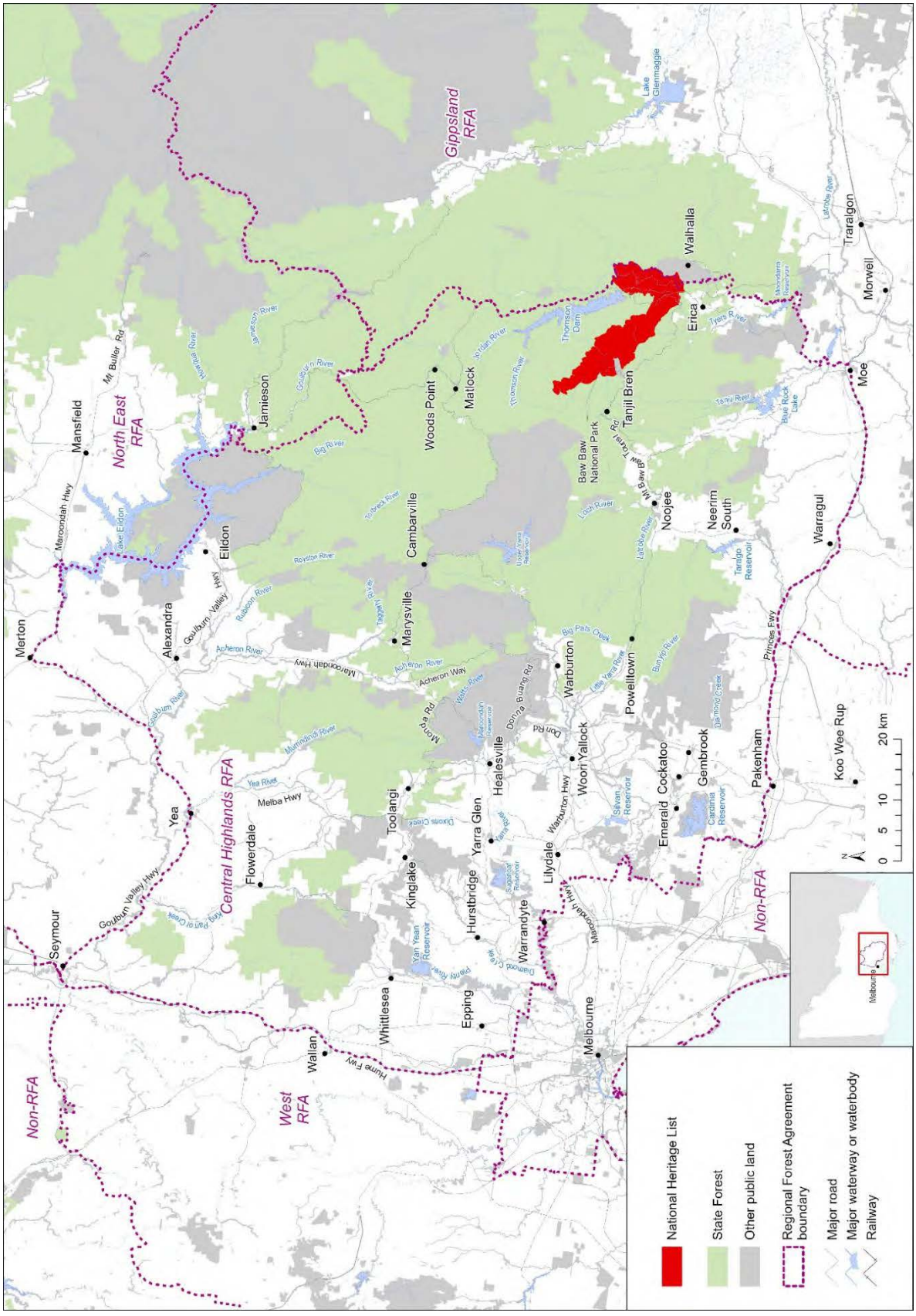
Commonwealth Heritage List

The CHL is a list of significant indigenous, historic and natural heritage sites owned by the Australian Government, such as places associated with defence, communications and other government activities. There are currently no CHL sites in the Central Highlands state forests.

National Heritage List

The NHL comprises a list of Australia's outstanding natural, historic and Indigenous sites. While no NHL sites are currently recorded in Central Highlands state forests, part of one site – the Australian Alps National Parks and Reserves – is located immediately adjacent to state forest and is important for understanding the regional context and values (figure 3.8). The Australian Alps National Parks and Reserves cover approximately 1,653,180 hectares of public land across Victoria, New South Wales and the Australian Capital Territory. The site is listed on the NHL for its unique natural environment and historical significance. The site encompasses several discrete parks and reserves, of which Baw Baw National Park is the only example in the Central Highlands (figure 3.8). The alps feature landforms that are rare in Australia such as high-altitude peaks, glacial lakes, and alpine ecosystems, hosting cold-climate adapted animals and plants. The area also holds cultural importance, with past Aboriginal use and a connection to Australia's pastoral and pioneering history. The Australian Alps have served as a centre for recreational snow sports and played a crucial role in Victoria's development by providing water for irrigation, generating electricity and domestic use.

Figure 3.8 National Heritage List site located in the Central Highlands state forests



3.4.3 Victorian Heritage Register and Victorian Heritage Inventory

The VHR and VHI are both lists of historically significant places and objects in Victoria. The VHR is the official register maintained by the government, offering statutory protection to the listed sites based on rigorous criteria. VHR sites mainly comprise heritage places such as buildings, trees, parks, gardens, archaeological sites, cemeteries, and shipwrecks. The VHI, on the other hand, is a more comprehensive but less formal database that provides valuable information for heritage identification and management without the same level of legal recognition and protection.

There are currently 145 registered historic sites recorded within the Central Highlands state forests. Twelve of these sites are listed on the VHR (of which five are also included on the VHI) and 133 are listed on the VHI exclusively (table 3.7, figure 3.9). These historic sites are mainly associated with the forestry and timber industry and mining and mineral industry (figures 3.10 and 3.11, table 3.8). Less numerous are historic sites related to water utilities, parks and gardens, rail transport, residential dwellings, and cemeteries and burial sites (table 3.8). A list of VHR and VHI sites reviewed are presented in the supplementary material available online, and a summary of each VHR site is also provided.

Table 3.7 Number of Victorian Heritage Register and Victorian Heritage Inventory sites in the Central Highlands state forests

Register	Number of sites	Total (%)
VHR	7	4.8
VHR and VHI	5	3.5
VHI	133	91.7
Total	**145**	**100.0**

Figure 3.9 Victorian Heritage Register and Victorian Heritage Inventory sites in the Central Highlands state forests

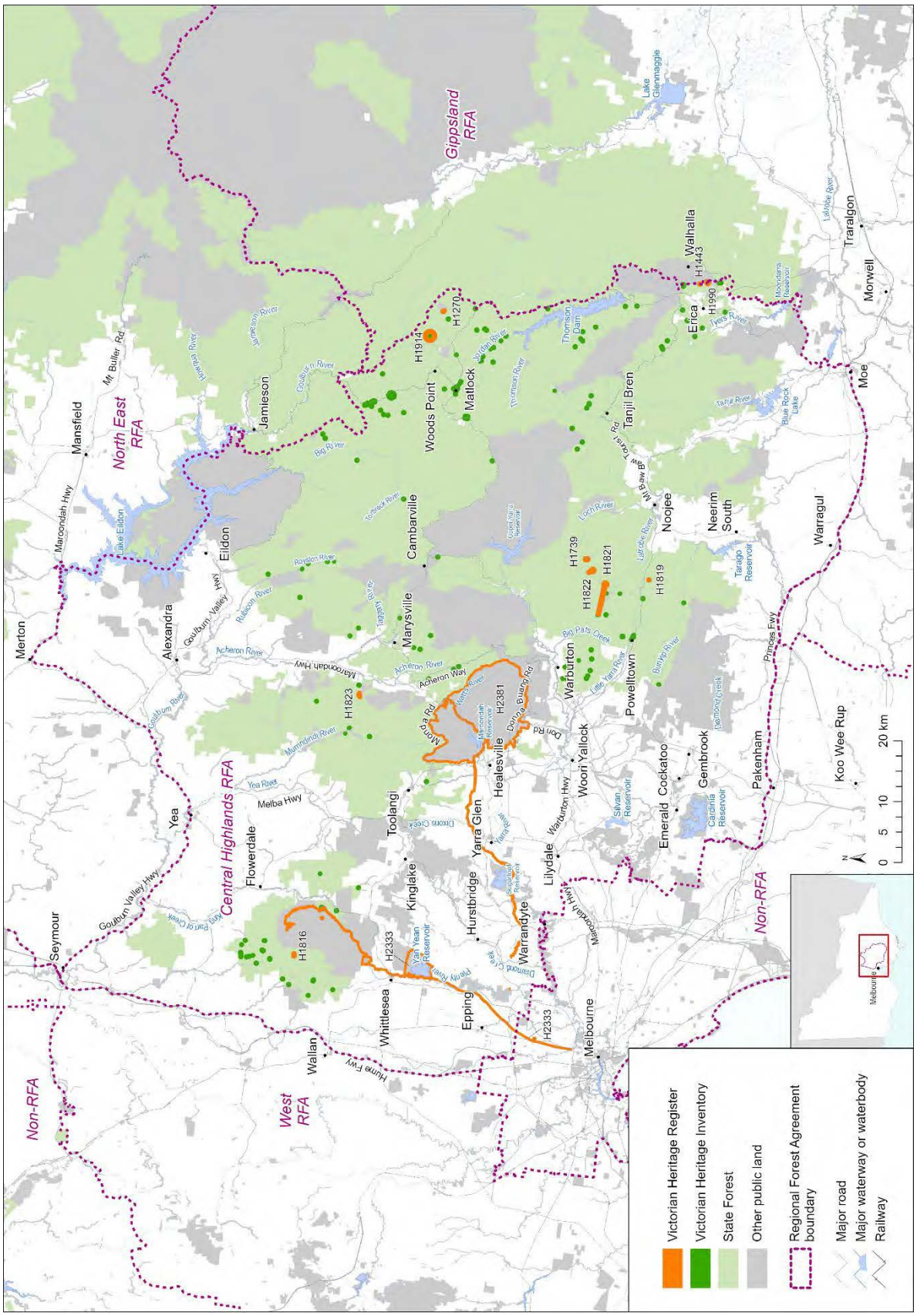


Figure 3.10 Historic sites categories in the Central Highlands state forests

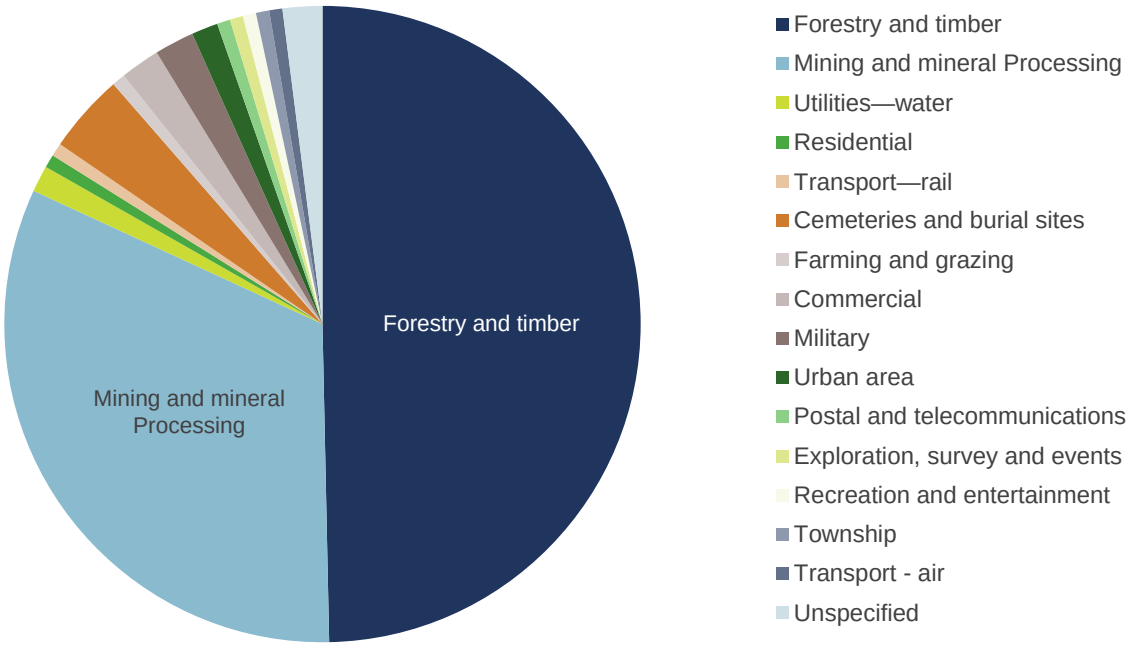
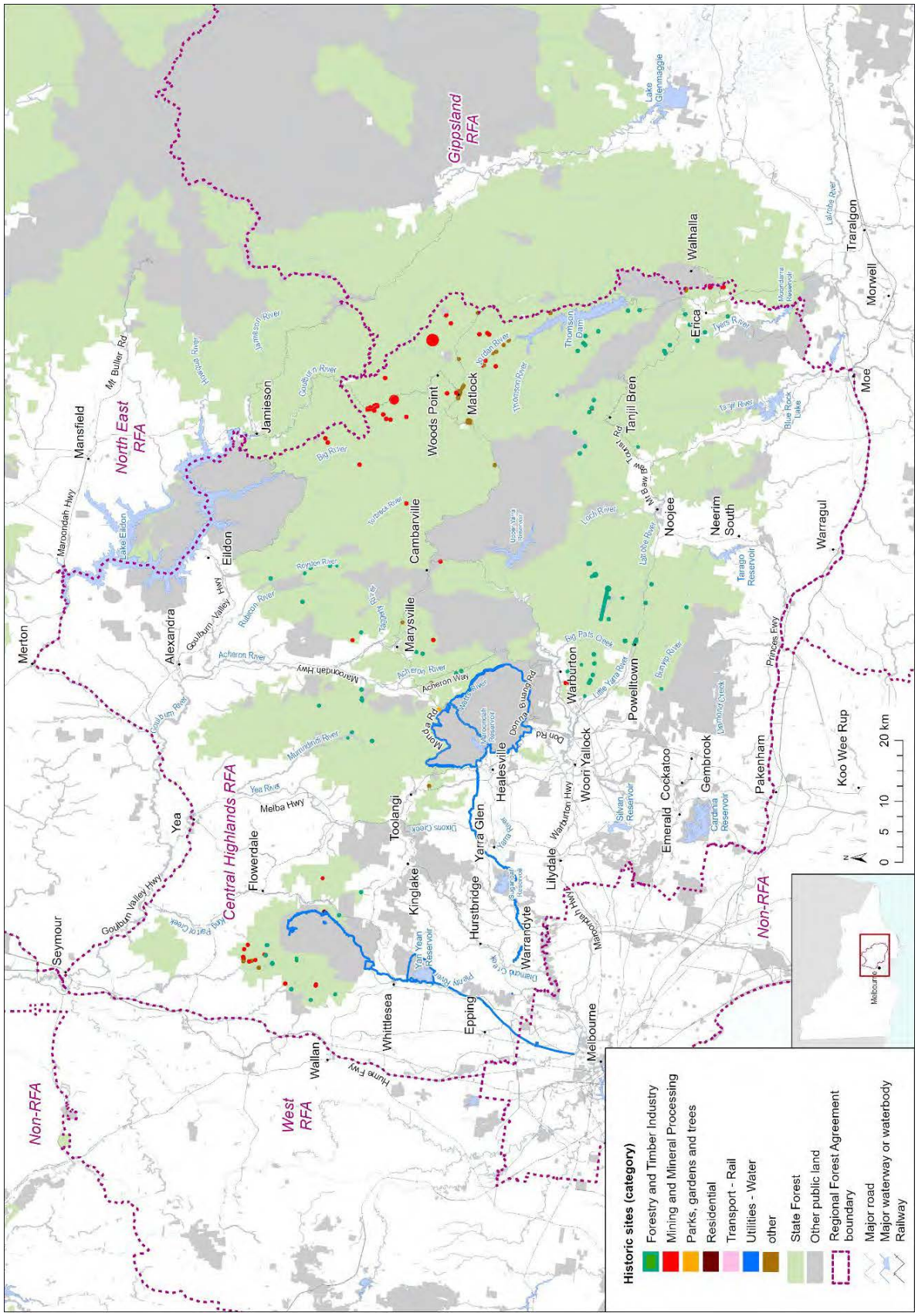


Table 3.8 Historic sites categories from the Victorian Heritage Register and Victorian Heritage Inventory in the Central Highlands state forests

Historic site category	VHR sites	VHI sites
Forestry and timber	6	68
Mining and mineral processing	3	45
Utilities – water	2	-
Residential	-	1
Transport – rail	1	-
Cemeteries and burial sites	-	6
Farming and grazing	-	1
Commercial	-	3
Military	-	3
Urban area	-	2
Postal and telecommunications	-	1
Exploration, survey and events	-	1
Recreation and entertainment	-	1
Township	-	1
Transport – air	-	1
Unspecified	-	3

Note: Some registered sites are in more than one category, therefore the total count of sites listed in this table is greater than the actual number of sites.

Figure 3.11 Victorian Heritage Register and Victorian Heritage Inventory sites with associated historic categories in the Central Highlands state forests



3.4.4 Local council planning scheme heritage overlays

Heritage overlays are usually relatively low in significance and have therefore not been reviewed in this current assessment, except for where they also have VHR and VHI components associated with them (see supplementary material available online).

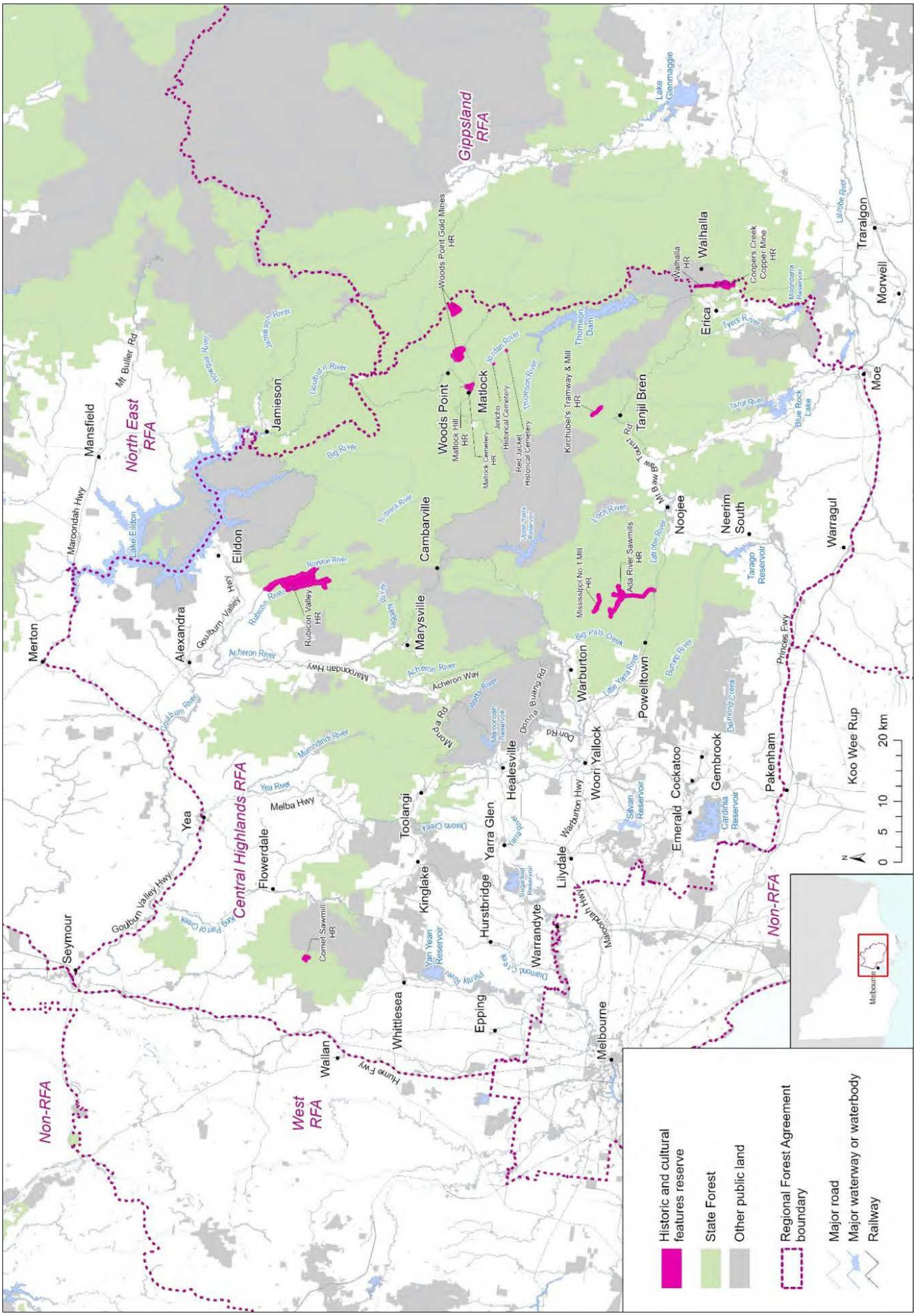
3.4.5 Historic and cultural features reserves

Historic and cultural features reserves (historic reserves) are designated spaces containing significant historical themes or archaeological features that are relevant to a specific area, region, or town. There are many historic reserves in the Central Highlands RFA area, including many in more settled areas away from state forests. There are 12 historic reserves in the RFA area that are surrounded by state forest (table 3.9, figure 3.12). A detailed list of historic reserves within the Central Highlands RFA state forests is provided in supplementary material available .

Table 3.9 Historic and cultural features reserves in the Central Highlands state forests

Historic reserve name	Municipality
Ada River Sawmills Historic Reserve	Baw Baw, Yarra Ranges
Comet Sawmill Historic Reserve - Mount Disappointment	Mitchell
Coopers Creek Copper Mine Historic Reserve	Baw Baw
Jericho Historical Cemetery	Baw Baw
Kirchubel's Tramway & Mill Historic Reserve - Tanjil Bren	Baw Baw
Matlock Cemetery Historic Reserve	Mansfield
Matlock Hill Historic Reserve	Baw Baw, Mansfield
Mississippi No 1 Mill Historic Reserve	Yarra Ranges
Red Jacket Historical Cemetery	Baw Baw
Rubicon Valley Historic Reserve	Murrindindi
Walhalla Historic Reserve	Baw Baw
Woods Point Gold Mines Historic Reserve	Mansfield

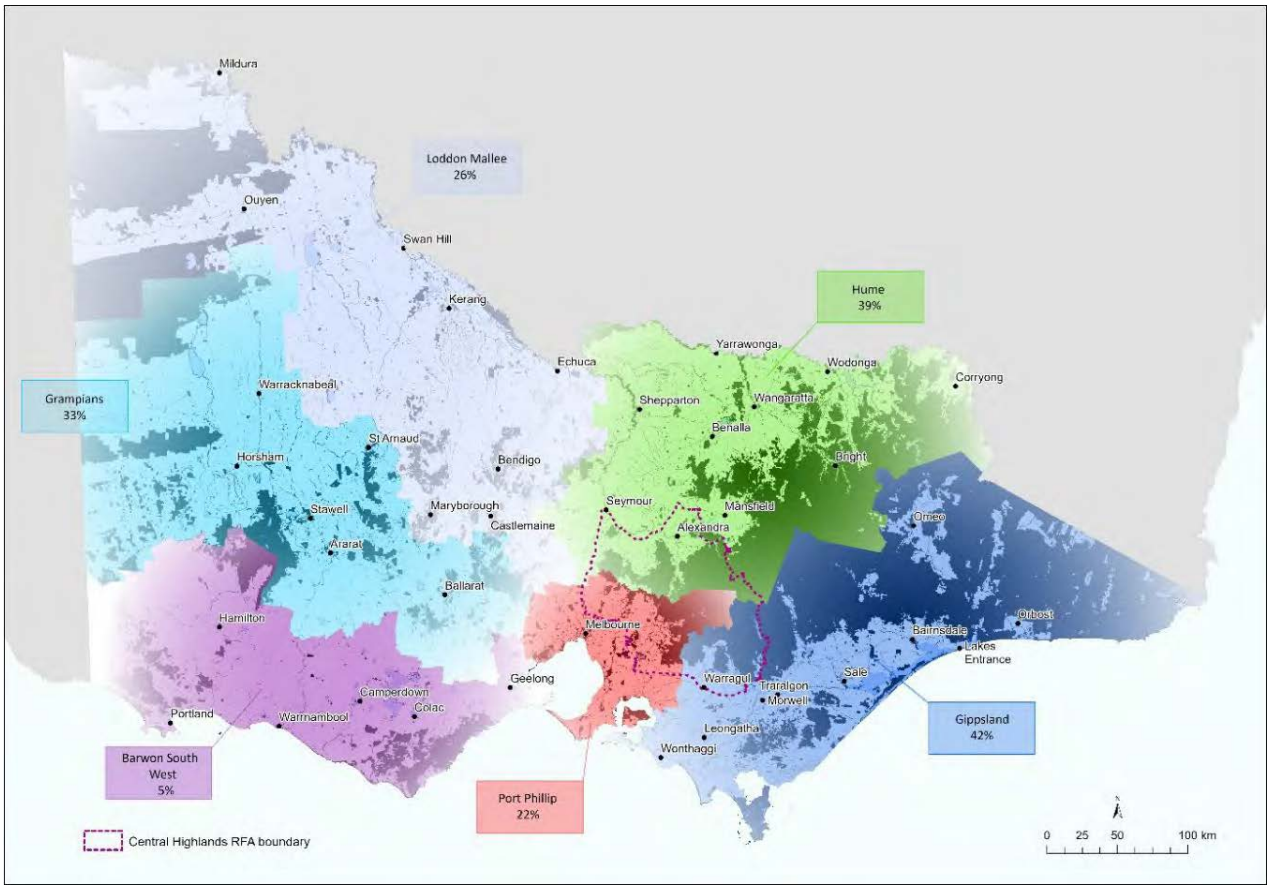
Figure 3.12 Historic and cultural features reserves within the Central Highlands state forests



3.5 Recreational uses

Surveys by land managers have shown an increase in visits to Victoria's public land in recent years. A 2019 study by DEECA into State forest visitation estimated that there had been over six million unique visits to State forests in the last six months. The same survey found that the most popular regions for visitors were Gippsland and Hume which include the state forests of the Central Highlands RFA area. Figure 3.13 shows the percentage of visitation by DEECA region. The total visitation is greater than 100 per cent because many people visited more than one region; the average number of regions visited is 1.7.

Figure 3.13 State forest visitation by DEECA region as of 2019 – adapted from a map originally published in *Understanding State Forest Visitation and Tourism*, DELWP 2019



State forests in the west of the Central Highlands RFA area are within a one-hour drive of Melbourne's eastern suburbs making them popular for day trips. As well as being close to Melbourne, the state forests have also seen recent investment to enhance recreational opportunities such as new mountain biking trails, upgrades to walking tracks and dedicated trail bike unloading areas. In the east of the RFA area the state forests receive fewer visitors; the forests are further from Melbourne and less attractive for day trips, there are also fewer sealed roads and major tracks making it more difficult to access the forests. On the other hand, the lower number of visitors makes these eastern areas ideal for those seeking a more remote nature experience such as dispersed camping, hunting trips and more challenging hikes and four-wheel driving experiences.

In April 2023 VEAC published its Advice to government on data on recreational activities on Victoria's public land. A key finding of the project was that, historically, data on recreational use has been highly variable across public land with limited information on the spatial and temporal extent of recreational activities. Although there is some information for broad areas of public land, there is generally not useful data for individual activities at the localised level. Without this type of data, the

following overview of recreational use is drawn from a range of sources such as visitor satisfaction surveys, data from fitness sharing apps such as Strava and social media and websites for recreation groups. However, there was insufficient time for discussions with land managers and recreational groups and individuals that would greatly improve information and understanding of recreational uses. It is expected that the EPCE will focus some of its time during the community engagement program on improving the understanding of recreational users and their needs in the RFA area.

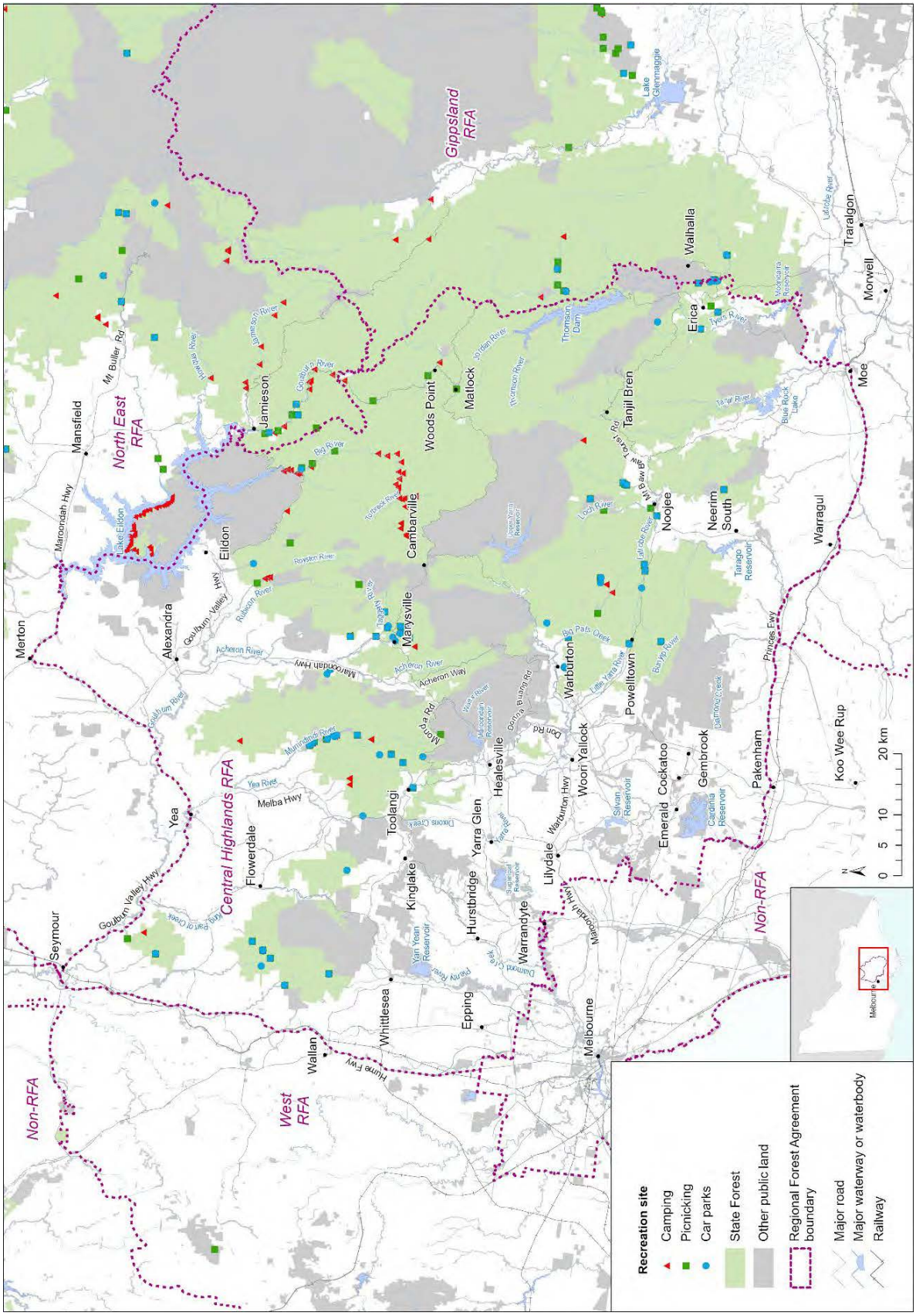
Camping and recreation sites

Figure 3.14 shows the extent of camping, picnicking and car-parking sites across state forest in the Central Highlands. These sites often have amenities such as pit toilets, fire pits and picnic tables and are used as points to access other activities such as bush walking, mountain biking, four-wheel driving, fishing and hunting.

Some of the most visited locations are those easily accessible from Melbourne; for example, the Rubicon State Forest has three camp sites situated along the Rubicon River providing easy access for fishing and paddling. Both the Kendalls camp site and the smaller Boys camping area at Rubicon offer facilities including pit toilets. In addition to these sites there is the smaller Tin Hut camping area with no facilities. Also close to Melbourne, Mt Disappointment has three main camp sites: Regular Camp, Andersons Garden and No. 1 Camp. There are also several sightseeing spots with picnic tables and pit toilets across Mt Disappointment State Forest. In the Yarra Ranges State Forest the main camping area is the Latrobe River Camping Area, situated near the river with facilities such as pit toilets and fire pits. At Ada River Sawmills Historic Reserve, which is situated within Yarra Ranges State Forest, there are three camp sites: Federation Mill, No. 2 Mill and Starlings Gaps camping grounds.

Further northeast, about 2.5 hours' drive from Melbourne, the Big River State Forest is a popular area for recreation. Numerous campsites are found concentrated along Arnold Creek and Big River, with the area becoming very popular during school holidays and long weekends. Many kilometres of forest tracks are accessible from these camp sites and there are many opportunities for fishing, nature study, deer hunting, bush walking and four-wheel driving. To the southeast of the study area the forest is less accessible with fewer tracks and steep terrain: fewer campsites and visitor areas provided.

Figure 3.14 Locations of camp sites, car parks and picnic spots in the Central Highlands



Mountain biking and cycling

Heatmaps from the fitness-tracking app Strava show the highest usage for mountain biking occurs in the Yarra Ranges. There has been significant investment to develop mountain bike tracks in this region. The Warburton Mountain Bike Destination is being developed in partnership with DEECA and Parks Victoria with input from the Wurundjeri Woi Wurrung, Melbourne Water and the Upper Yarra Community Enterprise. The project will develop 61 trails across the Warburton and Mt Donna Buang area with facilities for riders at 'trail heads', once completed is projected to bring approximately 128,000 new visitors to the Yarra Ranges annually.

Victoria's alpine regions provide ideal terrain for mountain biking and these areas have also seen significant investment with networks of trails being developed that are suited to a range of abilities. One of the most acclaimed trails is The Cascades Trail which runs for 30 kilometres beginning at Lake Mountain and ending in Marysville. To assist cyclists there is a bus shuttle which carries riders and their bikes to the top of Lake Mountain or bikes can be hired at the Lake Mountain Alpine Resort.

Other types of cycling experiences are also enjoyed on public land, including road cycling and gravel riding. Disused railway lines created in the early 1900s to service local industries now make ideal riding tracks that are flat, with generally smooth riding surfaces, and are close to towns and facilities. One of the most iconic rail trails in Victoria is the Warburton Rail Trail/Yarra Valley Trail which runs for 38 kilometres between Lilydale and Warburton. These types of cycling trails make the activity more accessible.

Horse riding

Horse riding is commonly enjoyed by individual riders accessing tracks directly from properties abutting the forest. As with many activities not involving club or commercial associations, the number of people involved is difficult to determine without consulting directly with local people. Several commercial groups operate in the study area organising group rides that use the state forest for all or part of their tours. Toolangi and Yarra Ranges state forests are popular locations for organised tours with many of these combining horse riding with visits to features such as historic sites and wineries as well as camping at privately owned campsites.

DEECA has provided facilities to cater for horse riders at some state forest visitor sites including Anderson Mill and Keppels Hut in Marysville State Forest, and Number One Camp at Mt Disappointment. The southernmost section of the Bicentennial National Trail, a 5330 kilometre riding trail along the Great Dividing Range from Cooktown in Queensland to Healesville in Victoria, can be accessed from Donnelly Weir picnic area near Healesville before going through the Yarra Ranges National Park and Marysville State Forest.

As exotic animals, horses are generally inappropriate in national and state parks. However, there are exceptions where horse riding is permitted. For example, Bunyip State Park allows for camping with horses and specific tracks provide for horse riding in Cathedral Range State Park, and Kinglake and Dandenong Ranges national parks.

Bushwalking and hiking

There are many walking tracks throughout the Central Highlands ranging from shorter walks that can be completed in under an hour to overnight hikes. Shorter walking trails are commonly found close to towns adjacent to state forests, for example there are numerous tracks that begin at Warburton ranging from 1 to 8 kilometres. More challenging, higher-graded hikes are found around the alpine regions; heatmaps from Strava show a high level of activity for hiking in and around the alpine resorts at Lake Mountain and Baw Baw. Trails in these areas include the Upper Yarra Walking Track which is a 103 kilometre trail from Mt Baw Baw to Warburton listed as a grade 5 hike and the Keppel Lookout Trail – a grade 4 hike to the top of Steavenson Falls near Marysville.

Walking and hiking trails are also popular with trail runners. Trail running, a growing sport, provides a connection with the natural environment as well as a more challenging and diverse running experience when compared with road running.

Bushwalking is frequently enjoyed in tandem with other recreational activities, accessing tracks from picnic, camping and scenic spots. The most popular tracks are located around areas of interest such as historic sites, for example the Cicada Circuit Trail and Kendalls Link Trail in the Rubicon Valley Historic Reserve; and the longer 50 kilometre Walk into History trail which begins at Warburton and retraces the routes of historic tramways past former bush mills.

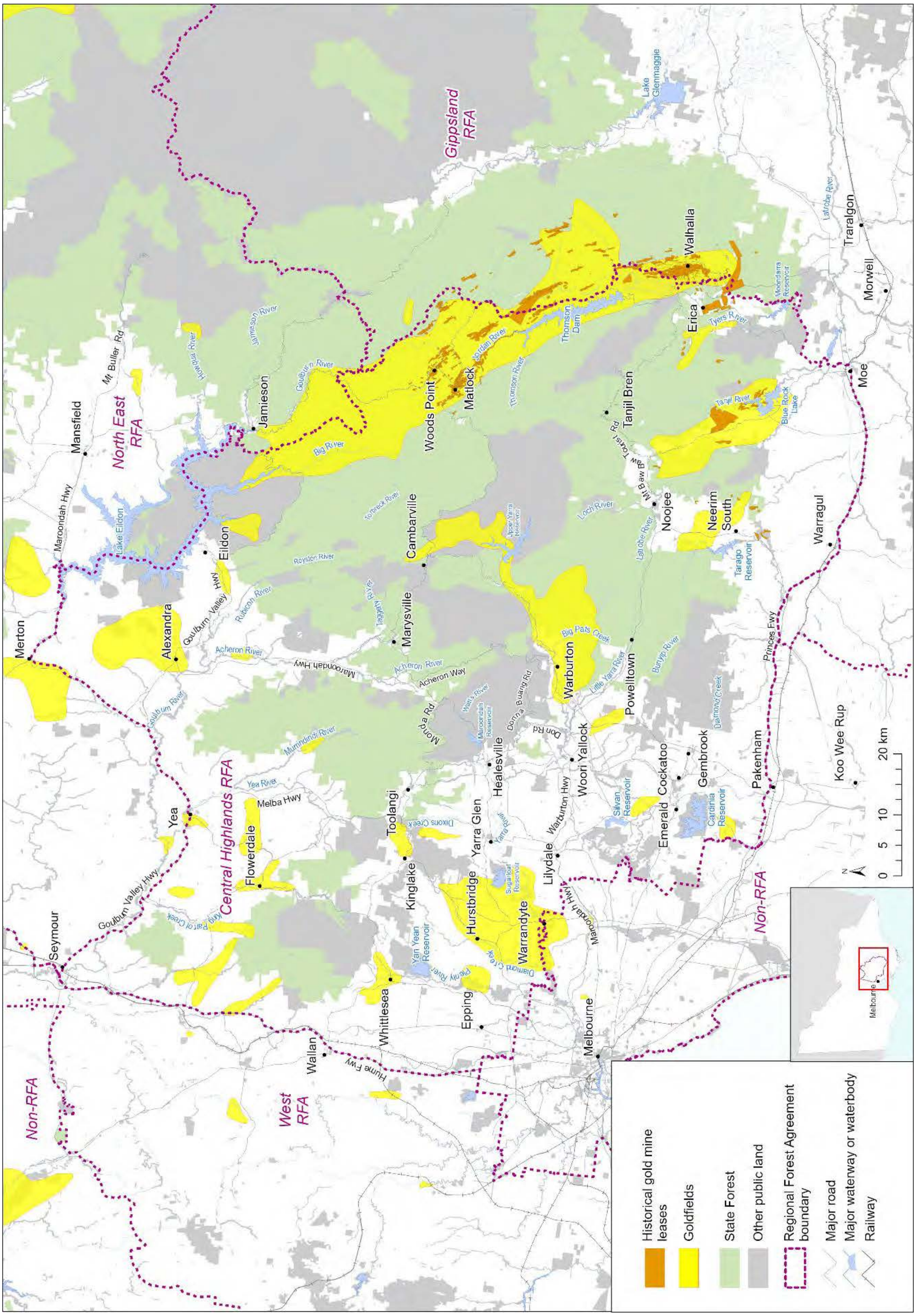
As part of the Victoria's Great Outdoors initiative, recreation sites including walking tracks have been upgraded. Through this funding new walking trails have been created in the Rubicon Valley Historic Reserve, there have also been improvements to the Keppel Lookout Trail in Marysville, and the Wirrawilla Rainforest Walk in Toolangi State Forest has been made safer and more accessible.

Prospecting

Recreational prospecting for gold involves the use of metal detectors, hand tools (such as picks and shovels), pans, cradles and sluices. There are approximately 73,000 active miner's rights in Victoria permitting holders to engage in prospecting in most public land use categories, including state forest and historic reserves, as well as in a small number of designated zones in some national and state parks including Warrandyte State Park in the west of the RFA area.

Gold mining history in the area dates to the 1850s and there is much evidence of historical alluvial mining around old goldfields (see figure 3.15). Key historic goldfields are those between Jamieson and Walhalla (particularly around Woods Point), along the Yarra near and upstream of Warburton and along the Latrobe River southeast of Noojee. Prospectors often visit historic gold sites such as these, although the exact location of where they visit is often not disclosed particularly if gold has been found.

Figure 3.15 Historic gold mining areas in the Central Highlands



Fishing, kayaking, canoeing and boating

As detailed in section 2.5, the five river basins of the Central Highlands contain hundreds of waterways which, together with some reservoirs (e.g. Eildon, Tarago), provide year-round opportunities for water-based activities such as fishing, kayaking, canoeing and boating. Campsites are often located along major waterways and there are numerous sites close to the Big River and the Goulburn River which provide visitors with access for fishing and boating activities. The Yarra River is readily accessed in many places such as near Warburton and Warrandyte and is a popular swimming spot during summer.

Four-wheel driving and trail bike riding

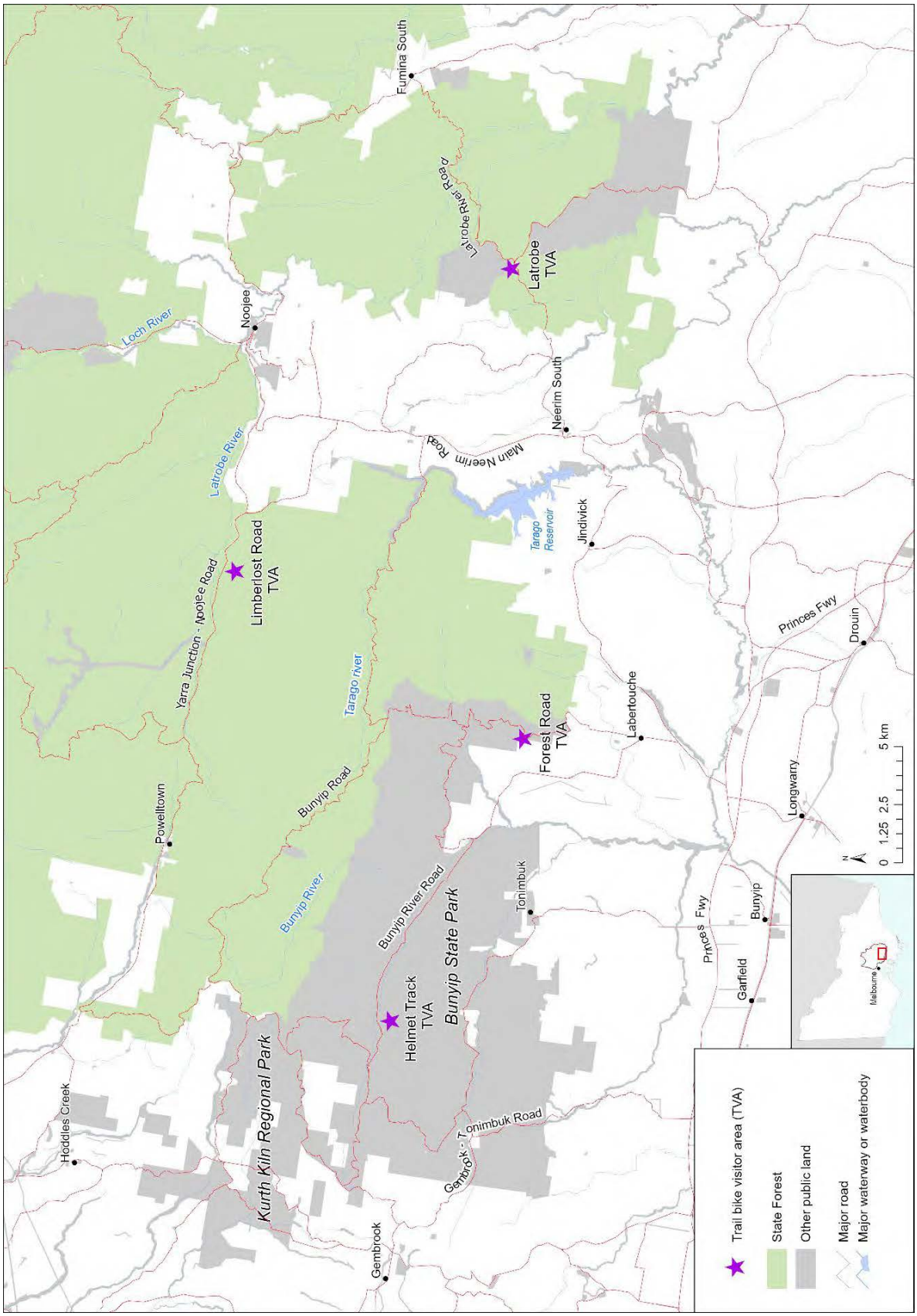
The majority of four-wheel driving is done by individuals or small groups, and there is little data on the level of use for specific locations. The most popular areas for four-wheel driving appear to be within easy reach of Melbourne where there are large numbers of tracks that have been created from timber harvesting access roads and fire protection access tracks. Toolangi offers a variety of experiences with more accessible routes using well maintained gravel roads, and smaller tracks that provide for a more challenging drive particularly in wetter seasons.

Four-wheel drive group events include volunteering days, navigation competitions and overnight camping trips, organised by recreation groups and peak bodies. One popular location for club events is the Big River State Forest where tracks into the forest can be readily accessed from camp sites.

In the alpine region there are fewer tracks and many areas are only accessible via four-wheel drive. In this area there are longer and more challenging four-wheel drive routes. DEECA's More to Explore app provides a self-drive map for tracks around Woods Point and Matlock including the Jordan Valley Loop taking a day and a half to complete.

In addition to four-wheel driving, trail bike riding and quad biking also occur on tracks where vehicles are permitted. Trail bike visitor areas have been created at popular locations providing facilities and a launching place for riding. The majority of these are within 100 kilometres of Melbourne and include sites in Mt Disappointment State Forest, the Marginal Road Trail Bike Visitor Area near Toolangi, the Latrobe Trail Bike Visitor Area east of Neerim South and the Limberlost Trail Bike Visitor Area near Powelltown. Bunyip State Park is very popular for trail bike riding and four-wheel driving and riders often venture into adjoining State forest from the trail bike unloading areas provided in the park (figure 3.16).

Figure 3.16 Trail bike visitor areas in Yarra Ranges



Hunting

The most common type of hunting in the Central Highlands is shooting for deer (mostly sambar, occasionally fallow and red deer), for which a specific type of game licence is required; another specific licence is required to hunt deer with hounds. There is also some shooting of other feral animals (mostly pigs, rabbits or foxes) and pig hunting with dogs and knives, although the denser mountain forests are generally not suitable for shooting rabbits and foxes. Duck and quail hunting are peripheral to the State forests and, therefore, to this assessment.

Many hunters value spending time outdoors and in remote places, and often combine hunting trips with other activities such as fishing, camping, hiking and four-wheel driving. It is difficult to estimate the number of hunting trips taken in the RFA area but a total of 58,332 people were licensed to hunt game (deer and some ducks) in Victoria in 2022. Surveys indicate that licensed hunters take an average of six hunting trips a year, with deer hunters taking more trips than other hunters. Trips may be one day up to a week or more and can be made by individuals, small groups of two or three people or be larger events organised by peak bodies and other organisations. For example, the Australian Deer Association arranges camping trips and also offers hunter education courses that are run in the State forests.

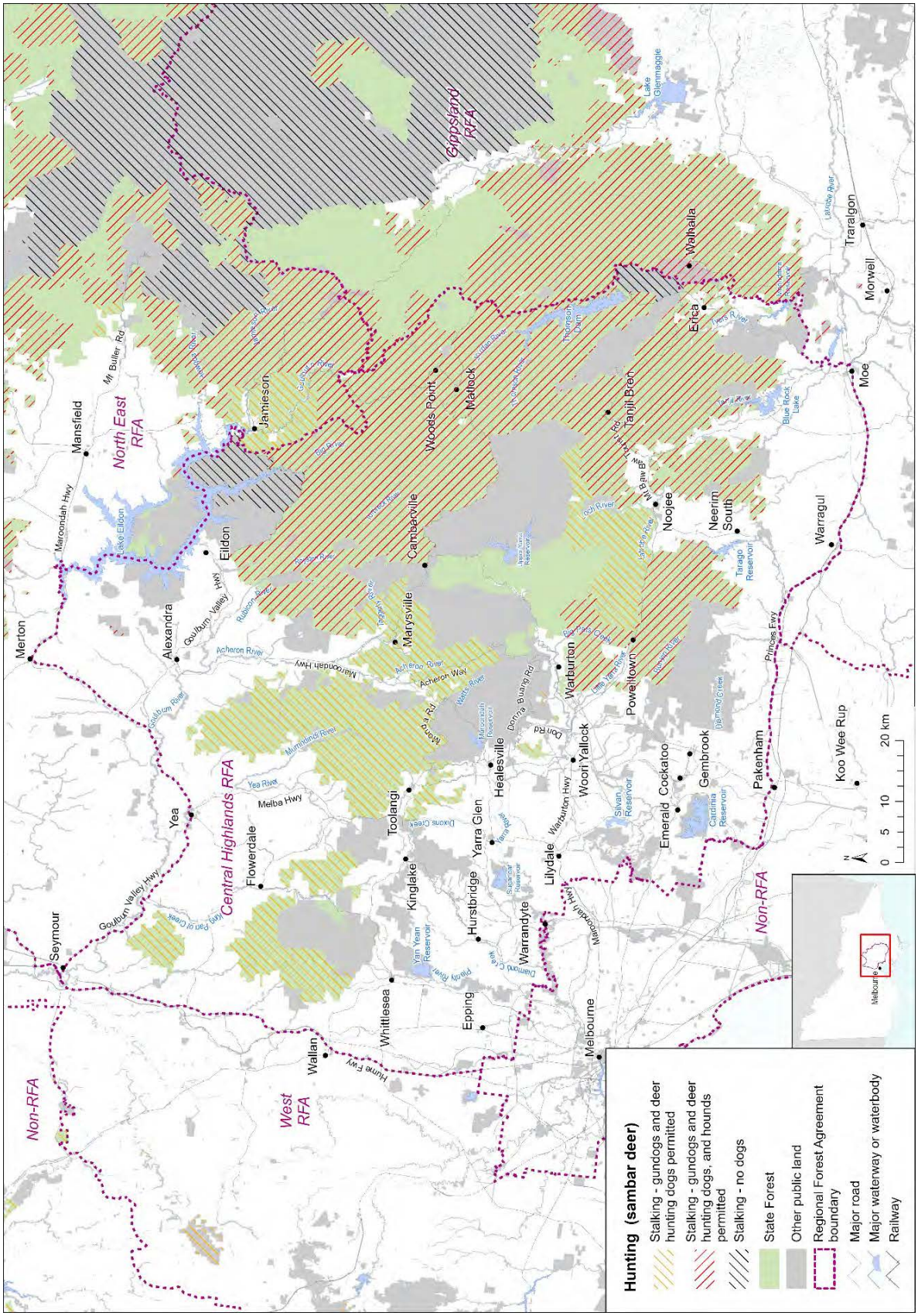
As shown in figure 3.17, licensed recreational hunting is permitted throughout most of the Central Highlands State forests.

However there are restrictions in certain locations; for example, all forms of hunting are prohibited within Melbourne Water closed catchments (figure 3.7) and deer hunting is prohibited around the Rubicon Power Station. Prohibited areas also include those around some residential areas such as Marysville, Kevington-Jamieson and Warburton. These locations were identified in consultation with hunters as areas where there is potential for conflict with other users.

Generally, firearms and dogs for recreational use – and therefore hunting – are not permitted at any time in national and state parks, but there are some areas where certain types of hunting can occur. For example, sambar can be hunted without dogs in designated areas in the south of Lake Eildon National Park seasonally from the first Saturday after Easter until 30 November each year. In Baw Baw National Park east of Thomson Valley Road all deer species may be hunted without dogs from 15 February to 15 December each year. Licensed shooting of pest animals is also popular in locations where it is permitted; hunting of pest animals is generally allowed year-round. More detailed information on restrictions, including links to maps of permitted areas can be found on the Game Management Authority website.

Deer hunters contend that all permitted areas in the Central Highlands are valued, including in the more remote Alpine regions. Hunting with hounds occurs in areas close to Lake Eildon, although it is not permitted in the national park, and in areas around Rubicon and Marysville. East of the Central Highlands RFA area, there are millions of hectares of forests available for hunting, including some of the most popular areas such as near Mansfield. These areas are further from Melbourne (where many hunters live) than the forests of the Central Highlands, which reduces their suitability for shorter trips. On the other hand, the forests more distant from Melbourne offer a more remote experience and reduced conflict with other users many of whom also live in Melbourne. As the population of Melbourne and many regional areas continues to increase, the potential for such conflicts is likely to increase which may reduce the popularity for hunting in the forests closer to population centres.

Figure 3.17 Areas where hunting is allowed in principle on public land in the Central Highlands RFA area



Various conditions apply in different areas and at different times; see the Game Management Authority website.

Nature appreciation

Increasing urbanised populations and pace of life means that many people seek time in nature to relieve stress, for health benefits and to simply appreciate the natural world. The Central Highlands State forests provide many of these opportunities within easy reach of Melbourne. Specific nature appreciation activities may interact with other recreational activities, but slower-paced experiences include seeking contact and immersion in nature, enjoying waterfalls, appreciating views from lookouts, experiencing natural sounds such as bird calls and flowing water. Other activities untaken by include birdwatching, photography, and orchid and rainforest appreciation. Forest bathing is about taking time to slowly and mindfully appreciate natural surrounds and has become a sought after experience in recent years particularly in national parks. Similar experiences can be found in the Central Highlands state forests on walks such as the Ada Tree Rainforest Walk located in the Yarra State Forest, south of Warburton, and the Wirrawalla Walk in the Toolangi State Forest, which is a timber boardwalk meandering through cool temperate rainforest with ancient myrtle beech and southern sassafras trees.

Snow-based activities

Mountainous regions where snowfall settles provide opportunities for a range of snow sport activities during the winter months such as tobogganing, cross-country skiing and snow play. Lake Mountain and Baw Baw Alpine Resorts provide the most extensive range of activities with dedicated facilities including snow machines and ski lifts at Mt Baw Baw. An entrance fee is payable during the snow season between June and late September, but other areas of public land notably Mount Donna Buang (in the Yarra Ranges National Park) provide free access for snow-based recreation. Although these focal points are all outside state forests, to a certain extent at least, the drive en route through state forests – particularly if there is snow on the ground – is part of the experience. Similarly, snow on the ground and on vegetation such as tree ferns adds to the experience on forest drives and bush walks.

Events

Occasionally large organised recreational events such as charity motorcycle rides and car rallies, and increasingly trail running,occur in state forests. While large, organised events require permits and, can cause disruption to local areas with the closure of tracks, the increase in visitors to an area can provide a boost to local economies. Two car rallies held in the Central Highlands are the Ada River Rally around Noojee and the Akademos Rally – last run in 2019 – in Black Range State Forest between Cathedral Range State Park and Yarra Ranges National Park.

Other non-motorised events such as marathons and charity walks may also take place in state forests.

Other activities

There are a variety of activities that occur in state forests, but without consulting with land managers and recreational users minimal information is available on the full range of activities and locations. For example, orienteering and rogaining are popular activities and the presence of local clubs in the Yarra Valley suggests local activity but details or data are not readily available publicly. Some activities, particularly pursuits that are not yet established, require extensive consultation and engagement with local communities and discussions with land managers in order to understand their extent, frequency, duration and impact.

3.6 Commercial uses

Wood products

Logging history

DEECA records show that logging occurred across the Central Highlands from the 1960s to the current day. Systematic records of logging prior to the 1960s are not readily accessible but it is known from at least the late 19th century and to have been substantial and widespread by the 1930s. Harvesting was concentrated in the higher value ash forests (predominantly mountain and alpine ash) particularly from the 1980s onwards (figure 3.18).

While clearfelling has been the predominant harvesting system, particularly in ash forests, the patterns and systems of harvesting have varied across the region and over time. Increasing mechanisation (from chainsaws, timber trucks and milling equipment) through the 20th century led to increasing harvest volumes, as did the establishment of woodchipping for export and local paper and pulp production. However, harvest volumes have been generally declining slowly for at least the last 20 years. These longer-term trends have been shaped by the effects of large intensive bushfires (including the maturing of subsequent regrowth) and also influenced by factors such as changing markets, the rise of the conservation movement, policy, and evolving forestry practices, research and planning.

Age class distribution of the ash forests

The age structure of ash forests is unbalanced. This is due to the influence of major landscape-scale bushfires and logging, in which trees are generally killed by intense fires or clearfelling, leading to even-aged stands after regeneration from seed (see figure 3.19).

In 1939, major bushfires burnt about two million hectares of forest in and around the Central Highlands and led to the establishment of hundreds of thousands of hectares of even-aged forest dominated by commercially valuable mountain and alpine ash. This 1939 regrowth has been the primary source of high-value sawlogs in Victoria due to the size and quality of logs from these two species. The impacts of subsequent fires, in particular the 2009 Black Saturday fires, have further skewed the age class distribution of ash species.

As a result, today these forests can be broadly grouped into three classes:

- forests regenerated from the 1939 fires
- forests regenerating from disturbance activities between 1940–2000, and
- forests regenerating from the three landscape fires of the 2000s (2003, 2006/07, 2009).

Figure 3.18 Year of most recent recorded logging by decade across the Central Highlands RFA area

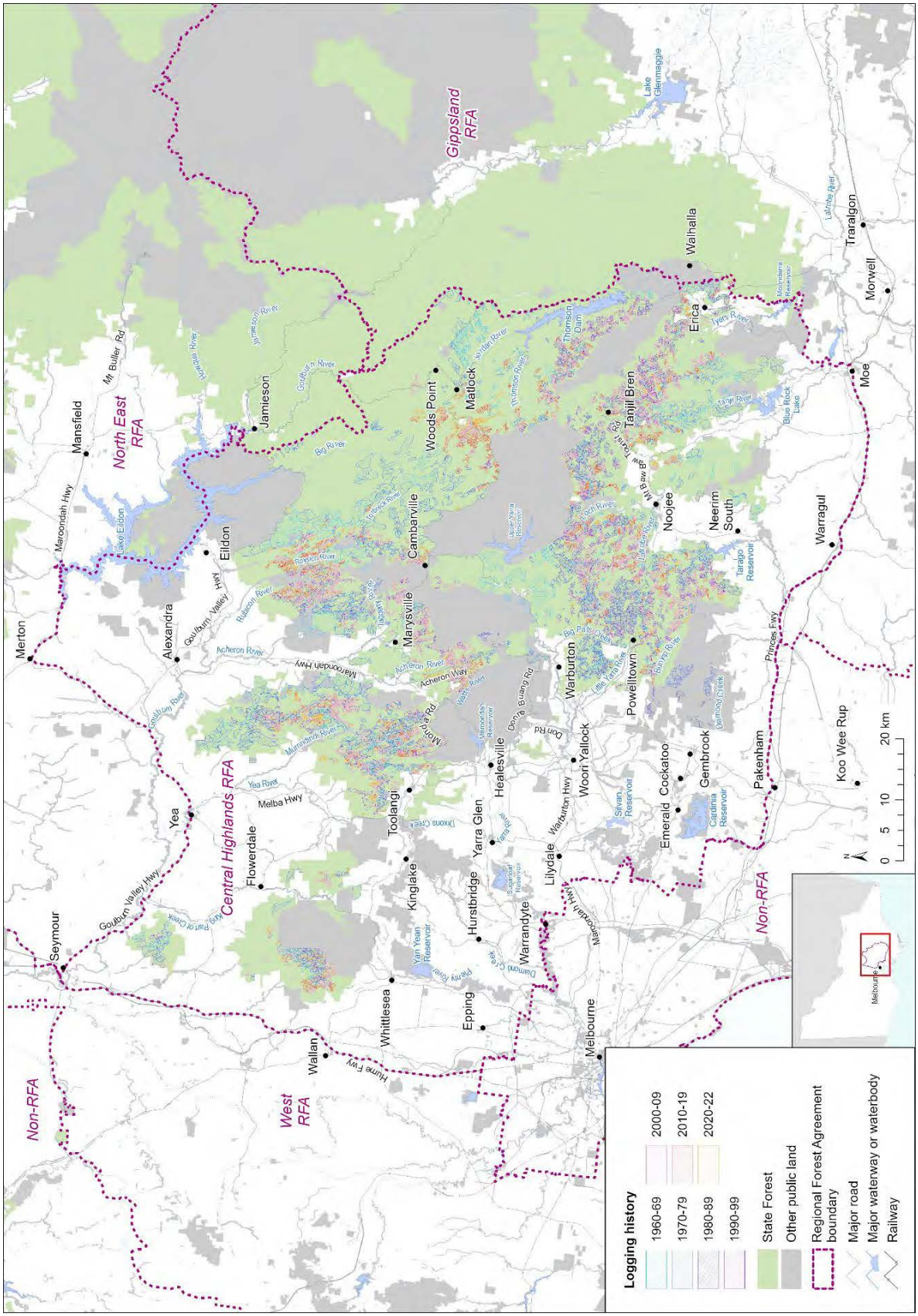
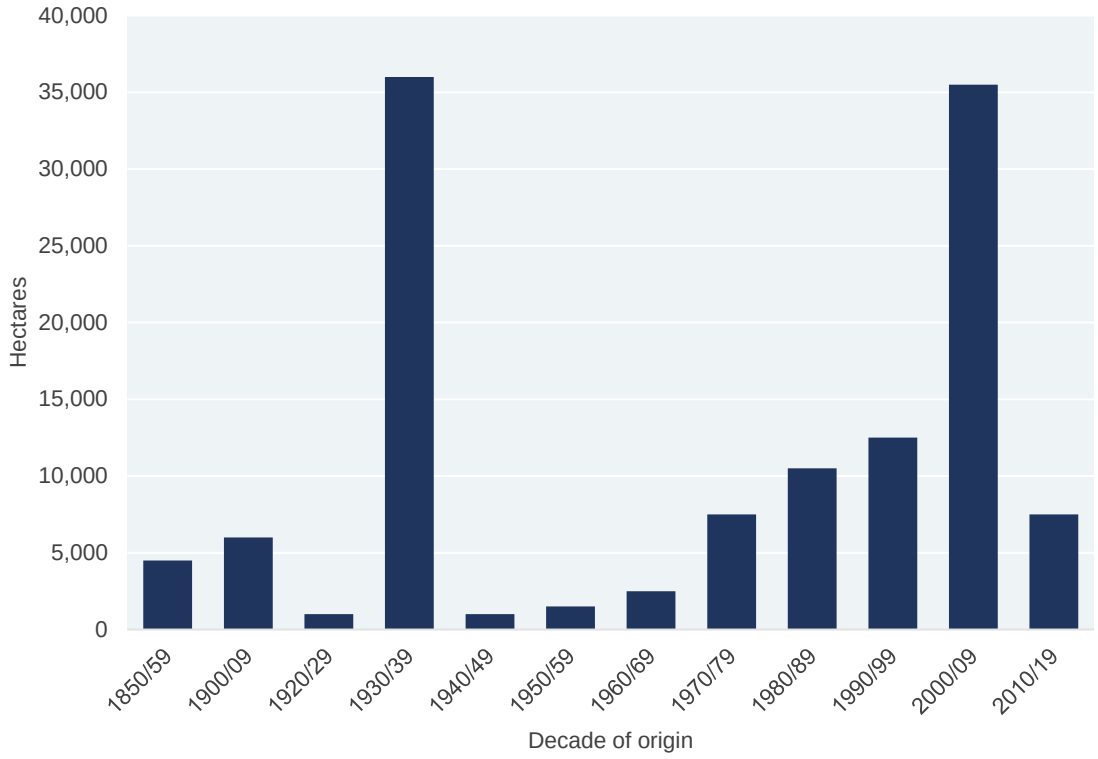


Figure 3.19 Ash age class distribution



Domestic firewood collection

Firewood can be collected for domestic use from nominated collection areas in State forests across Victoria, during designated collection periods in spring (1 September to 30 November) and autumn (1 March to 30 June). Firewood collection areas are mostly along two-wheel drive roads and four-wheel drive tracks within state forests and collection can occur within designated distances from the edge of the road into the forest.

No more than 2 cubic metres of firewood per person per day is allowed to be collected, and a household cannot collect more than 16 cubic metres per financial year. It is illegal to sell firewood collected from domestic collection areas or to use the wood in a commercial enterprise.

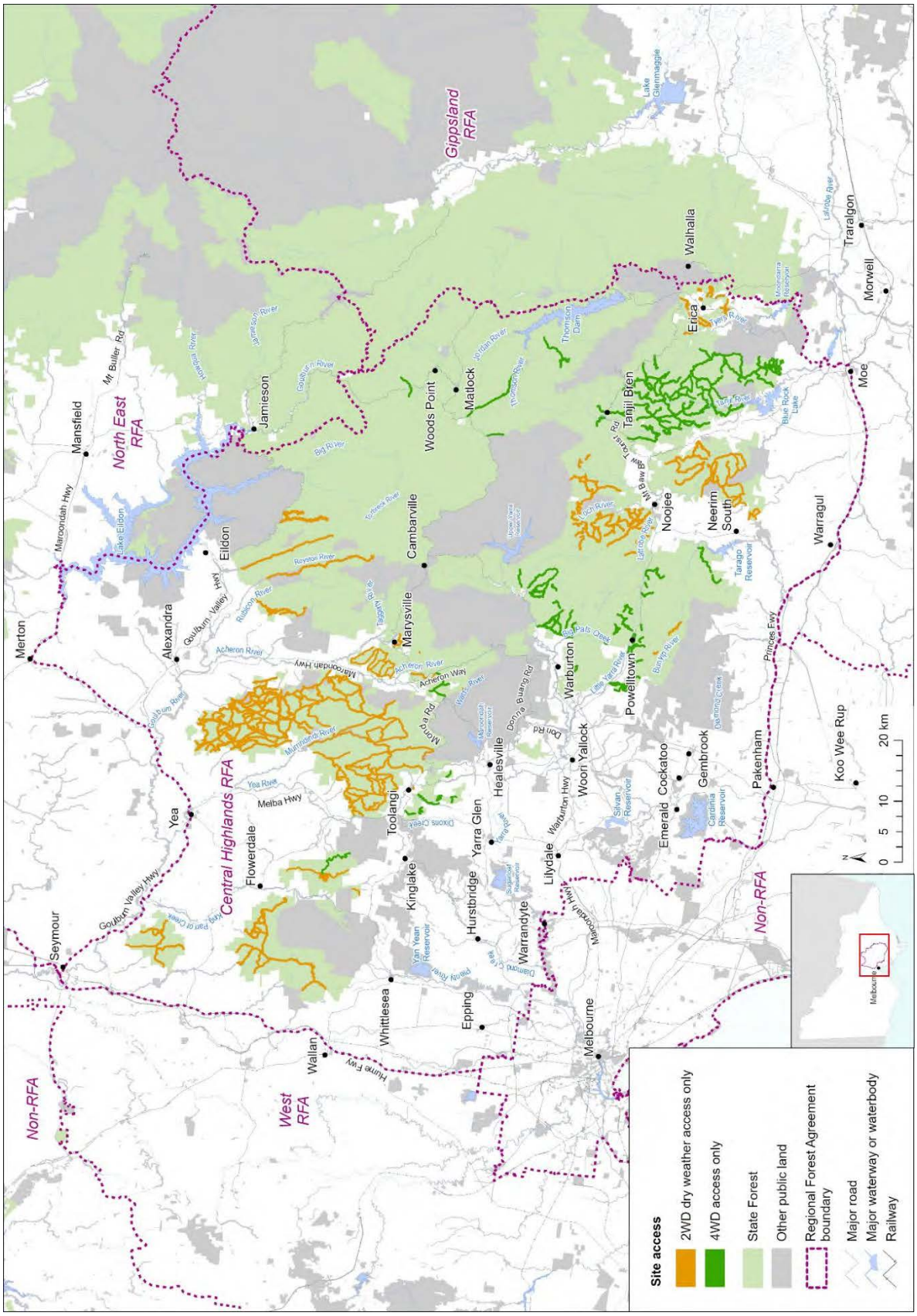
Firewood collection rules apply and are displayed on Forest Fire Management Victoria website. Seasonally updated maps of permitted collection locations are also available from the Forest Fire Management Victoria website, and that for spring 2023 is shown in figure 3.20.

Systematic information is not collected on the volume of domestic firewood harvested, and there are no analyses for trends.

Commercial firewood harvesting

Commercial firewood is firewood that may be harvested from forests by businesses that then sell it on to households and businesses. Historically, commercial firewood has been a by-product of sawlog harvesting in the mountain ash forests of eastern Victoria.

Figure 3.20 Roads and tracks that DEECA may make available for domestic firewood collection in the spring 2023 season



Other minor forest produce – seed collection

Native seed is collected by DEECA, VicForests, the Department of Jobs, Skills, Industry and Regions and some private collectors.

The quantity collected depends on the demand for particular species. Eucalypt species, which make up the majority of collection, do not set the same amount of seed every year, thus the quantity and quality of seed available for collection varies over time.

The largest quantities of seed harvested have been used in state forests for harvesting regeneration and fire recovery operations. Smaller quantities of seed have been harvested for commercial tree growing in nurseries and sale. Royalties are paid for seed collected by those outside state government.

Adequate seed collection is increasingly key to the ability to restore and regenerate ecosystems impacted by frequent and intense fires, e.g. obligate seeding ash forests, and other disturbances.

Apiculture

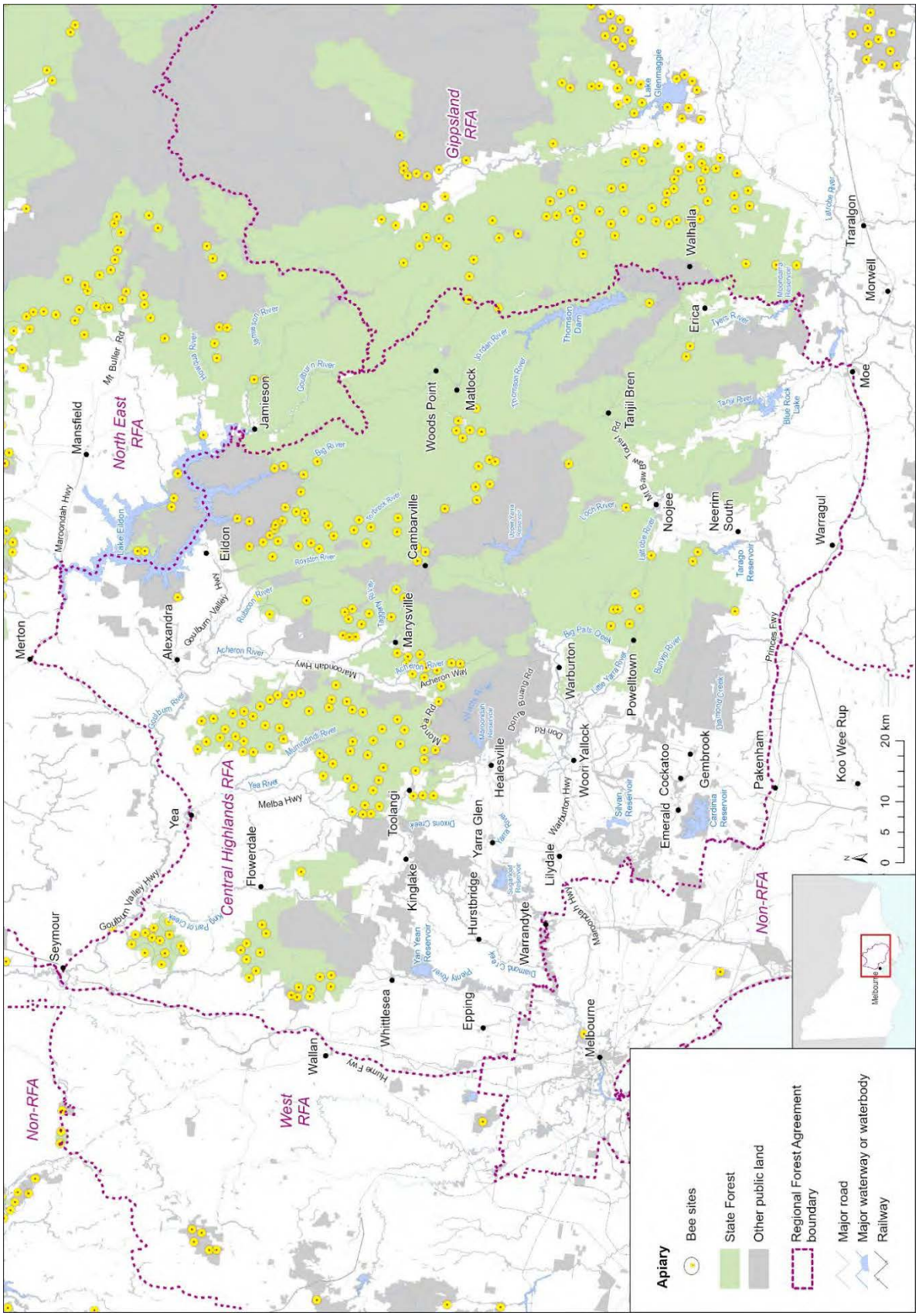
The production of honey and other apiary products is heavily dependent on forest ecosystems for floral resources that sustain bee populations and eucalypts are a common source of nectar and pollen. European honey bees are also very important for pollination of many valuable crops and native forests play an important role in sustaining hives before and after they are deployed for crop pollination.

There are 4,730 licensed apiary sites on public land across Victoria. Most sites are located within state forest, with some in national and other parks, nature and bushland reserves and various other public land use categories. They are excluded from reference areas.

The apiary sites data includes all public land apiary sites even if currently vacant. The majority of these apiary sites have an 800 metre radius buffer or base range, and some have a 1,600 metre radius buffer from other bee sites on public land.

Figure 3.21 shows the locations of the 186 apiary sites on public land in the Central Highlands RFA area. These sites (about 4 per cent of the Victorian total) are mostly located in the forests on the north side of the Great Dividing Range in the Goulburn River basin. A smaller number are located across the cooler and wetter southern slopes of the Great Dividing Range. The areas without bee sites tend to be the higher elevation areas in the east where steep topography makes access difficult.

Figure 3.21 Bee sites within the Central Highlands



Education

Education areas are a subset of the community use reserve public land use category. Although in a separate category to state forest, their proximity can serve as a focus for educational activities to occur in the nearby state forests.

There are three education areas in the Central Highlands RFA area:

- Castella Education Area is adjacent to Toolangi State Forest just north of Toolangi.
- Kinglake West Education Area is located on the King Parrot Creek near Kinglake West, nearby and partly adjacent to the Mount Robertson State Forest.
- Fumina South Education Area is located adjacent to the eastern boundary of the Neerim State Forest, just south of Fumina South.

Licences and leases

Many uses of public land are managed through licences (which provide non-exclusive use over an area) or leases (which grant an exclusive right to occupy a defined area of land).

State forests in the Central Highlands RFA area have licences and leases issued under the *Forests Act 1958* and the *Land Act 1958*.

The types of licences and leases in the Central Highlands state forests, the relevant Act and the number of current licences or leases are listed in the table 3.10 below. Note that some tenures are made up of several spatially separated parts; these are counted as one in this list. These licences and leases are mapped in figure 3.22.

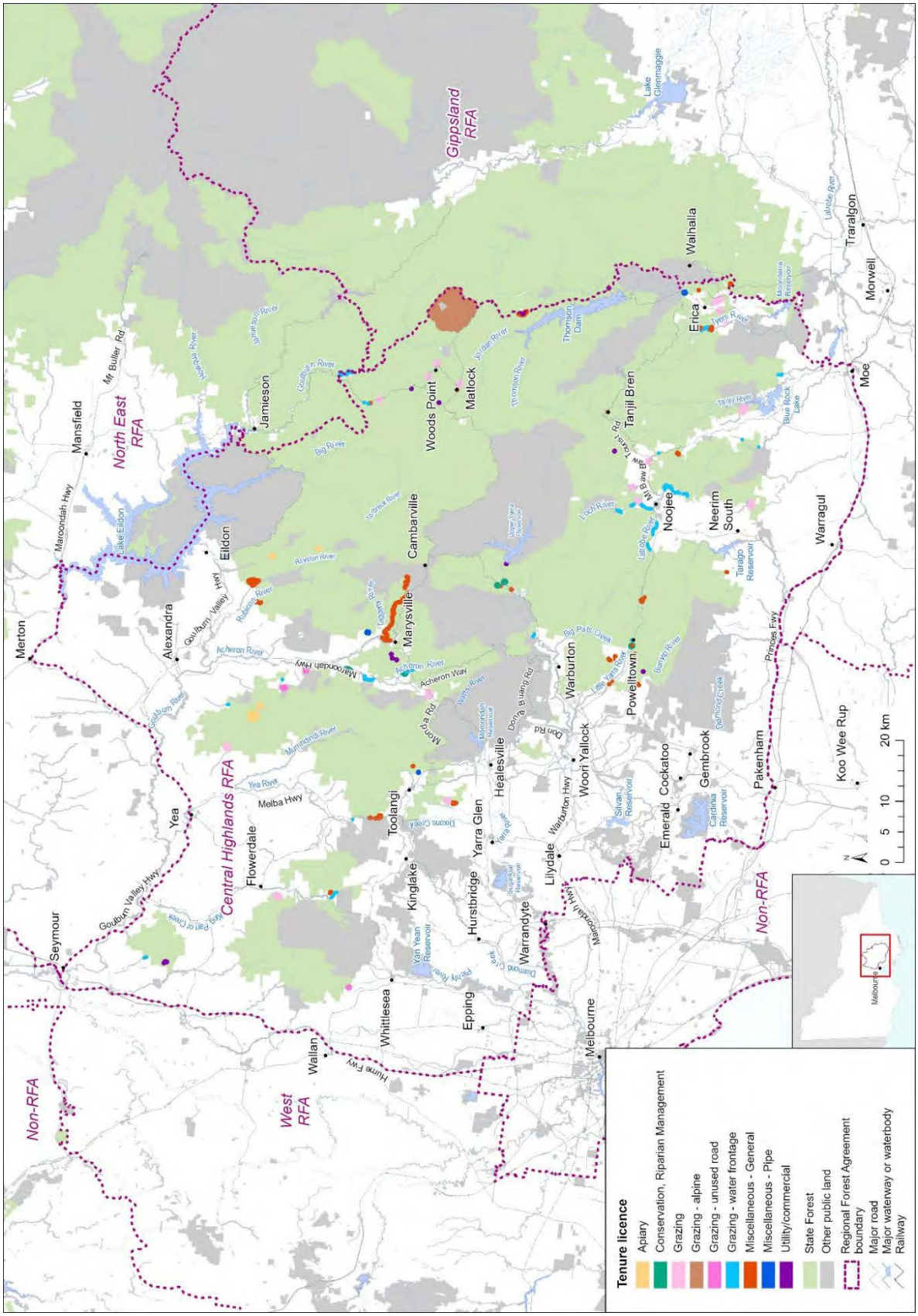
There are 135 tenures over the state forests in the Central Highlands, covering a total area of 4,145 hectares, or about 1 per cent of the state forest area. The largest is a 3,630 hectare alpine grazing licence in the Upper Goulburn State Forest. Around two thirds of the licences and leases are each less than two hectares.

Further background information on these licences and leases is provided in the supplementary material available online.

Table 3.10 Tenures in the Central Highlands state forests

Type of lease / licence tenure	Act Applied	No. of current tenures	Area (ha)
Alpine grazing licence	*Forests Act 1958*	1	3,630.35
Apiary right (bee farm)	*Forests Act 1958*	2	0.06
Apiary right (bee farm)	*Land Act 1958*	2	71.58
Conservation licence – water frontage	*Land Act 1958*	1	0.42
Emergency services use licence	*Land Act 1958*	1	0.02
Grazing licence	*Forests Act 1958*	6	28.91
Grazing licence	*Land Act 1958*	11	26.58
Grazing licence – non prim production	*Forests Act 1958*	1	5.14
Miscellaneous (general) licence	*Forests Act 1958*	20	165.74
Miscellaneous (general) licence	*Land Act 1958*	17	27.66
Miscellaneous (general) licence	Dual status (*Forests Act 1958* & *Land Act 1958*)	1	33.54
Radio/TV/telecom lease	*Forests Act 1958*	7	0.09
Radio/TV/telecom lease	*Land Act 1958*	3	0.07
Radio/TV/telecom site licences	*Forests Act 1958*	5	0.54
Recreation/amusement licence	*Forests Act 1958*	2	8.83
Residence licence	*Forests Act 1958*	1	0.14
Riparian management licence	*Land Act 1958*	6	9.67
Scout and/or guide use licence	*Forests Act 1958*	1	0.01
Unused road licence – primary production	*Land Act 1958*	3	1.34
Water frontage licence – non production	*Land Act 1958*	2	0.52
Water frontage licence – primary production	*Land Act 1958*	42	133.51
Total		**135**	**4,144.72**

Figure 3.22 Licences and leases across the state forests in the Central Highlands RFA area



3.7 Earth resources

Historic mining activity

Across the Central Highlands state forests, historic gold mining activity is concentrated in the east, extending from around the Woods Point area, in a southwest direction to around Walhalla (figure 3.23). Some activity also occurred southeast of Noojee.

Some tin mining around Powelltown occurred in the 1880s. Around Coopers Creek, east of Erica, historical mining for copper and platinum group elements are also known. An old antimony mine existed in the 1880s at the locality of Red Jacket, south east of Matlock.

Current activity

Mining licences

Within the Central Highlands area there are six current mining licences (figure 3.24). Five of these are gold mines located in the Big River and Upper Goulburn state forests north of Matlock over areas of 1, 5, 108, 211, and 658 hectares. This includes the A1 and Morning Star Gold Mines north of Matlock, which have a combined fold resources of 1,169,000 ounces of gold. The A1 Gold Mine is currently operational and the Morning Star Gold Mine has recently closed. The sixth mining licence, also for gold, is located in the Tanjil State Forest, northeast of Hill End and is about 5 hectares in size.

There are no current retention licences in the Central Highlands state forests.

Mineral exploration licences

Figure 3.24 shows large parts of the Central Highlands state forests under current Exploration Licences or applications for Exploration Licences. All exploration licences are primarily for gold. Some also include exploration for a variety of other minerals including antimony, copper, lead, zinc, bismuth, silver, tin, tungsten, molybdenum, platinum and palladium.

Extractives activity

There are seven current Extractive Industry Work Authorities within Central Highlands state forests totalling 38.71 hectares (figure 3.24). Six of these range from around 2 to 5 hectares in size quarrying for either sedimentary hard rock or hornfels in the Marysville, Black Range, Big River and Erica State forests. A 16.5 hectare Extractive Industry Work Authority for basalt is located in Noojee State forest.

Prospecting licences

There are no prospecting licences in the Central Highlands state forests.

Pipelines

No major oil or gas pipelines pass through the Central Highlands state forests.

Mineral and extractive resources potential

The Geological Survey Victoria (GSV), in DEECA conducted an assessment of the mineral potential of the Central Highlands state forests and included some adjacent forests in the North East and Gippsland RFA areas (refer to the supplementary material available online).

There is significant potential for gold in the state forests in the east of Central Highlands area bolstered by presence of gold mines in the Woods Point – Walhalla Goldfield, including the currently operating A1 Gold Mine and Morning Star Gold Mine, which was operating until recent closure in November 2023.

Figure 3.23 Historic mining areas in and around the Central Highlands RFA area

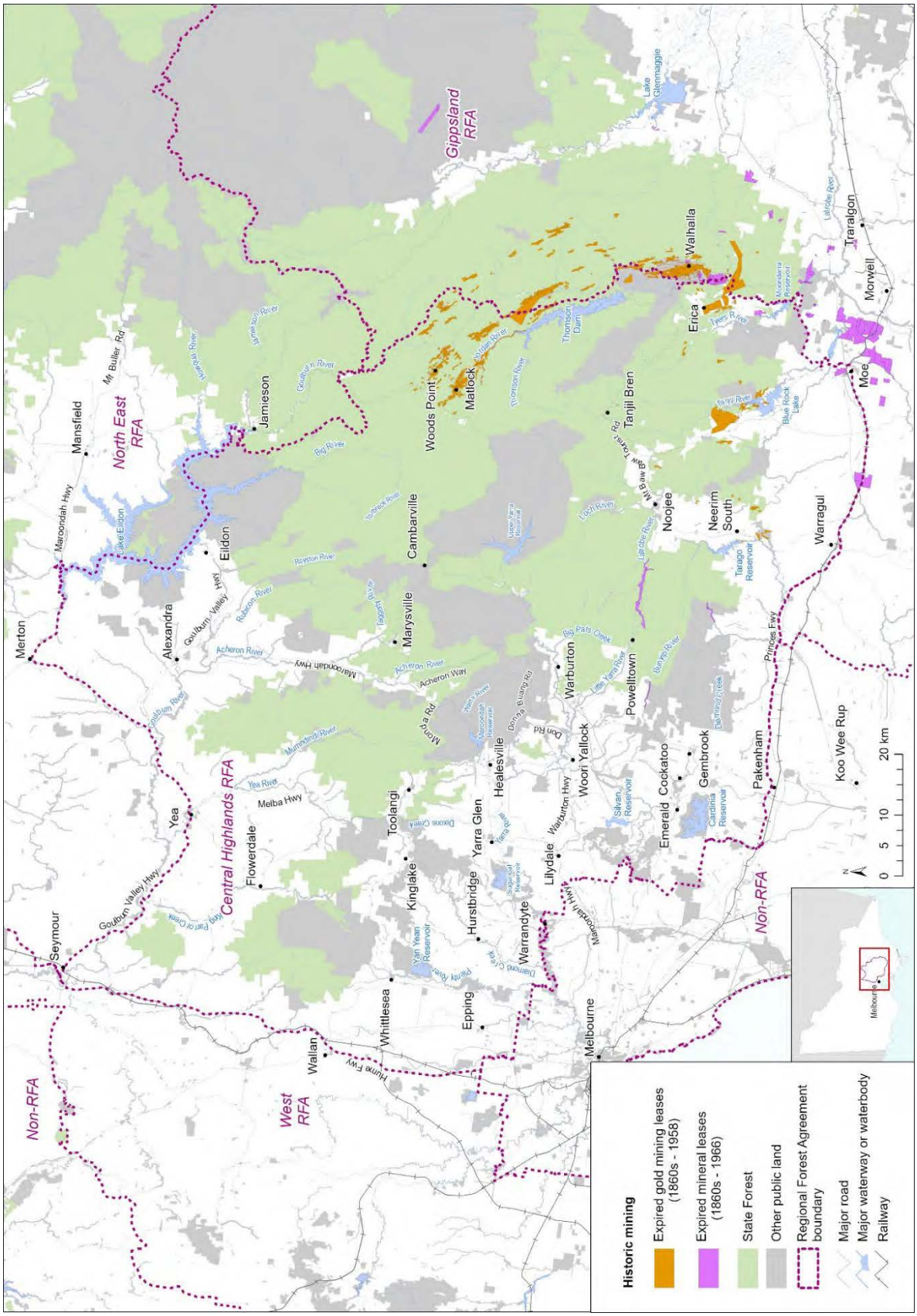
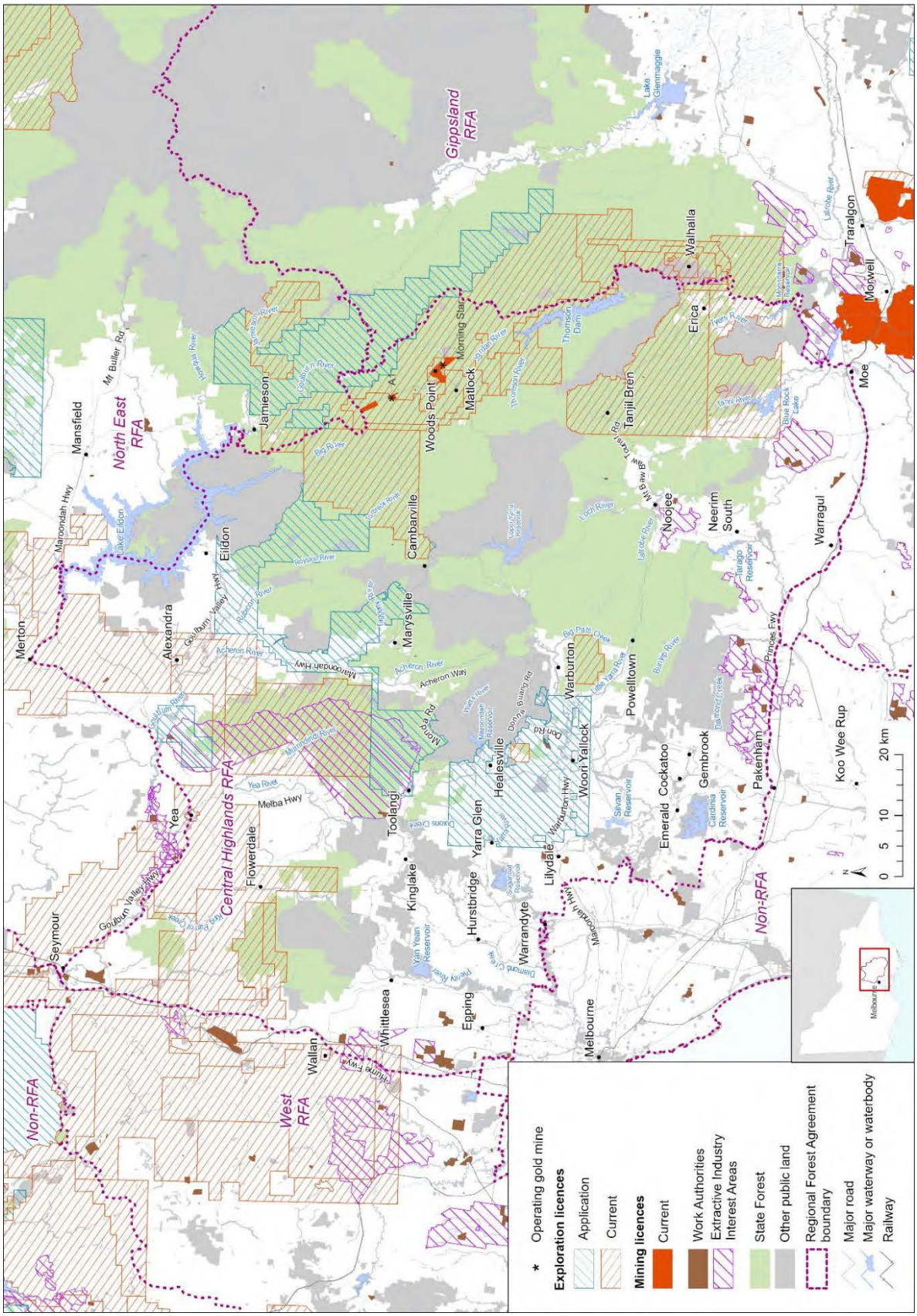


Figure 3.24 Mining and extractive tenements, and EIIAs in the Central Highlands RFA area



Critical minerals are the metals required to build renewable energy infrastructure such as wind turbines, batteries and electric motors and are of increasing economic and strategic value for Australia and Victoria. GSV assessed the potential quantity of critical minerals in-ground based on known prospectivity of geology across state forests. Recent studies have identified the western Tasmanian geology known as the Dundas Trough extending into central Victoria (an area known as the Selwyn Block), and this is raised towards the surface in the Governor Fault Zone. The Dundas Trough contains significant copper-gold deposits and the Selwyn Block has now been shown to contain Tasmanian-style copper-gold mineralisation and the potential for a range of additional minerals.

The estimated combined gold and other metal (including critical minerals) in-ground metal content (in gold equivalent ounces) of each state forest is shown in figure 3.25. The estimated in-ground gold and critical mineral content in the state forests was converted to gold equivalent ounces based on commodity prices in July 2023. The Upper Goulburn State Forest area (located in the east of Central Highlands RFA and over part of the North East and Gippsland RFAs) has the highest potential for gold and critical minerals. Note that this is a broad indication encompassing the whole state forest area; actual mineral deposits may be concentrated in smaller locations within the state forest area.

GSV also assessed the minerals and extractives potential of some state forest areas using a second methodology based on historic mining and mineral occurrences, surface geochemistry and magnetic data. Areas near Erica and east of Warburton in particular, exhibit very high potential for critical minerals (including copper, nickel, tin, tungsten, antimony, zinc, rare earth elements, platinum group elements and cobalt), gold and extractives (including limestone and sedimentary hard rock).

Potential sand, gravel, granite and hornfels source rocks for construction materials are delineated by a large Extractive Industry Interest Area (EIIA) located over part of the Toolangi and Black Range state forests (figure 3.24).

3.8 Diverse values

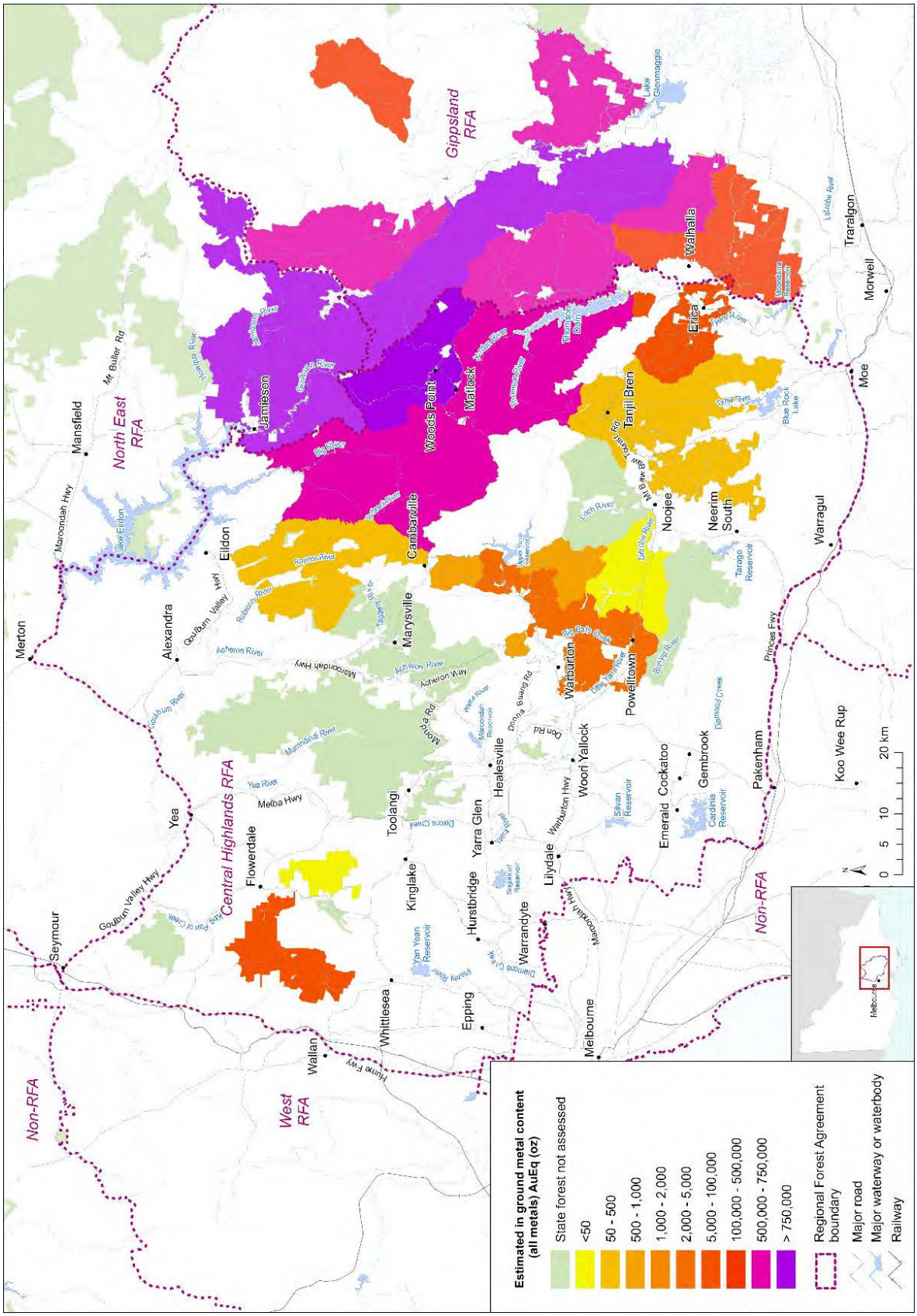
The methodological assessment report on the Diverse Values of Nature and Valuation of Nature https://zenodo.org/records/7410287 prepared by the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) 2022, proposed new ways to describe how different worldviews and knowledge systems influence the ways people interact with and value nature, particularly non-market values.

These values will be assessed further and documented in VEAC's final report in mid-2024.

Some perspectives on these diverse values that the Central Highlands forests hold are:

- cultural values specific to Traditional Owners
- people perceive, experience and interact with nature in many ways including spiritual, and intrinsic values – that nature has a right to exist in itself
- scientific values allowing research to be conducted to further understand how nature interacts and supports life
- old trees represent nature in terms of long time frames, sustainability and resilience opposite to some societal values that emphasise short term, materialistic gains
- from an international perspective, Australia is a wealthy country and has the ability to protect and conserve areas of nature
- good quality of life means being able to access nature, 'live in harmony with nature', 'respecting Mother Earth' and this is valuable.

Figure 3.25 Estimated geological value of the state forests using estimated gold and critical minerals in-ground metal content (in gold equivalent ounces)



Note: GSV clarifies that where state forests are not assessed, this does not represent a lack of potential earth resources, only that there is no data that currently exists that enables assessment based on the described methodology, or that the forests were not part of the assessment.

4. Threats to the values of the Central Highlands state forests

This chapter addresses the topic in (c) of the terms of reference, to identify the current and likely future threats to the values described in chapter 3 of this report, including climate change.

There are several different approaches used to assess threats to biodiversity and to social and economic values which are referenced in this chapter. Some involve qualitative, judgement-based assessment utilising expert opinion, while others are quantitative assessments that include modelling. There has been a significant amount of work undertaken in Victoria on threats to forest biodiversity in eastern Victoria.

Assessment of the threats to social values such as recreation, amenity and community wellbeing are generally qualitative judgement-based assessments. They utilise community opinions as well as expert opinion and the input of Traditional Owners and land managers.

4.1 Previous assessments of threatening processes

In 2017 VEAC was requested to carry out an assessment of the conservation values of state forests in the Central Highlands, North East, Gippsland and East Gippsland regional forest agreement areas. The terms of reference specified that VEAC was to report on the current and likely future threats to the biodiversity and ecological values of the assessment area. This section updates that report.[27]

Some of the most detailed work relating to threats to forest values in the area was carried out more than 20 years ago in the preparation of the comprehensive regional assessment for the original Central Highlands Regional Forest Agreement (RFA) in 1998. An updated assessment of matters listed in the five Victorian RFAs, including current status of the values, has since been jointly prepared in 2019 by the State of Victoria and Commonwealth of Australia to inform the modernisation of Victoria's RFAs. [28]

In addition, action statements prepared for listed species, communities and threatening processes under Victoria's *Flora and Fauna Guarantee Act 1988* (FFG Act) specifically focus on threats and management action to address those threats.

Victoria's biodiversity plan Biodiversity 2037 focuses on the planning and management of:

- actions to treat broad-scale common threats across a landscape that provide the greatest benefit to the greatest number of species and a preventative approach to reduce the risk of species becoming more threatened
- bespoke actions to meet the unique needs of individual species.

At a national level, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the identification and listing of key threatening processes. The Australian government has developed threat abatement plans for most of the key threatening processes registered under the EPBC Act where a threat abatement plan was considered a feasible, effective or efficient way to abate the process.

It should be noted that the listed threatening processes summarised below don't reflect their order of priority, inter-relationship or relative impact.

27 veac.vic.gov.au/investigations-assessments/previous-assessments/investigation/conservation-values-of-state-forests-assessment-report

28 agriculture.gov.au/agriculture-land/forestry/policies/rfa/regions/victoria/centralhighlands

4.1.1 Regional Forest Agreements

In the preparation of the comprehensive regional assessments for the RFAs, the Victorian and Commonwealth governments agreed that the biodiversity assessments should be undertaken at the species and ecosystem levels and should include reviews of the main threats to such biodiversity in the regions. Each of the biodiversity assessments for the four RFAs in eastern Victoria identified threats or disturbances to forest ecosystems, terrestrial flora, terrestrial fauna and aquatic fauna. Threatening processes identified as likely to affect forest ecosystems were summarised and discussed in the assessment reports (dated from 1997 to 1999). At a species level, the assessments generally noted that the decline of species can be largely attributed to the impacts of disturbances, both directly on the species and indirectly on essential components of their habitat. Disturbances which can have negative effects (direct or indirect) on a species were referred to as potentially threatening processes.

Table 4.1 lists the potentially threatening processes identified for the four eastern RFAs, most of which were mentioned in the biodiversity assessments for the Central Highlands RFA.

Table 4.1 Potentially threatening processes identified in Comprehensive Regional Assessments for the four eastern RFAs

Threatening process or disturbance
Clearing of native vegetation/fragmentation
Timber harvesting
Planned burning - fuel reduction
Planned burning - regeneration burning
Planned absence of fire
Unplanned fire (wildfire)
Grazing
Road construction and maintenance
Recreation
Environmental weed invasion
Introduced fauna species/predation/competition
Pest control
Firewood collection
Deliberate collection/harvesting (legal and illegal)
Mining/quarrying
Dams/impoundments/instream barriers
Climate change
Mineshaft collapse
Pathogens/disease/dieback
Loss of genetic diversity/genetic pollution
Drainage of wetland habitat
Waste disposal

4.1.2 Flora and Fauna Guarantee Act listings and action statements

The FFG Act provides for the listing of taxa (genera, species, subspecies, varieties), threatened communities of flora and fauna and potentially threatening processes.

More than 2000 species, communities and threats are currently listed under the Act. This is a substantial increase from the 750 or so in 2017 when VEAC's Conservation Values of State Forests Assessment was prepared. Amendments to the FFG Act in 2019 almost tripled the number of threatened species by establishing a single comprehensive list of threatened flora and fauna species. Previously, Victoria had multiple lists of threatened species – those listed under the FFG Act, and non-statutory lists called the Victorian threatened species advisory lists. To date, about 320 action statements have been developed for threatened species, communities and threatening processes listed under the Act, although there are advanced drafts for others.[29]

In 2021, the Victorian Auditor-General's Office (VAGO) reported on DELWP's acquittal of its responsibilities under the FFG Act and in Biodiversity 2037 to better protect threatened species.[30] VAGO noted that the backlog of action statements had only worsened since a previous audit in 2009 due to the increased number of listed species following amendments to the Act in 2019. Only 20 per cent of listed species are covered by an action statement although many have advanced drafts. VAGO further commented that many of these action statements are more than 10 years old and may no longer reflect a species' status or current and emerging threats to species' persistence.

There are 38 potentially threatening processes listed under the FFG Act as at May 2023 of which 12 have action statements (excluding those relating exclusively to marine and estuarine environments). The following item was added to the potentially threatening processes list in May 2023: Poisoning of native wildlife by anticoagulant rodenticides.

Listed potentially threatening processes relevant to forest ecosystems in eastern Victoria are shown in table 4.2, ranked in two categories with the first being those with potentially high significance for forest biodiversity in the assessment area as assessed by VEAC, and the second being those with potentially moderate significance.

Action statements for forest-dependent threatened species typically contain intended management actions that require the establishment of timber harvesting exclusion zones or modified harvesting procedures.

Of the 35 threatened species used in the focused forest-dependent species analysis presented in VEAC's 2017 assessment of the conservation values of state forests,[31] 12 had approved action statements under the FFG Act. Eleven of the 12 action statements mention timber harvesting as a threat, six mention wildfire and six mention competition from other plants/weeds/pests/predators and so on. The next two most frequently mentioned threats are roading and visitor pressures including over collection.

29 DEECA (2023) Action Statement Priority Preparation List: 2022–2023

30 audit.vic.gov.au/sites/default/files/2021-10/20211013-Protecting-Victoria%27s-Biodivrsity.pdf

31 Chapter 2 in VEAC (2017) Conservation values of State forests assessment report.

Table 4.2 Potentially threatening processes listed under the FFG Act potentially relevant to the assessment area

Potential high significance for forest biodiversity
High frequency fire resulting in disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
Human activity which results in artificially elevated or epidemic levels of Myrtle Wilt within *Nothofagus*-dominated Cool Temperate Rainforest
Infection of amphibians with Chytrid Fungus, resulting in chytridiomycosis
Invasion of native vegetation by Blackberry *Rubus fruticosus* L. *agg.*
Invasion of native vegetation by 'environmental weeds'
Loss of coarse woody debris from Victorian native forests and woodlands
*Loss of hollow-bearing trees from Victorian native forests
Loss of terrestrial climatic habitat caused by anthropogenic emissions of greenhouse gases
*Predation of native wildlife by the cat, *Felis catus*
*Predation of native wildlife by the introduced Red Fox *Vulpes vulpes*
Potential moderate significance for forest biodiversity
*Alteration to the natural flow regimes of rivers and streams
Alteration to the natural temperature regimes of rivers and streams
Collection of native orchids
*Degradation of native riparian vegetation along Victorian rivers and streams
Habitat fragmentation as a threatening process for fauna in Victoria
Inappropriate fire regimes causing disruption to sustainable ecosystem processes and resultant loss of biodiversity
*Increase in sediment input into Victorian rivers and streams due to human activities
*Introduction of live fish into waters outside their natural range within a Victorian river catchment after 1770
Loss of biodiversity in native ant populations and potential ecosystem integrity following invasion by Argentine Ants *Linepithema humile*
Poisoning of native wildlife by anticoagulant rodenticides
*Prevention of passage of aquatic biota as a result of the presence of instream structures
Reduction in biodiversity of native vegetation by Sambar *Cervus unicolor*
Reduction in biodiversity resulting from Noisy Miner *Manorina melanocephala* populations in Victoria
Reduction in biomass and biodiversity of native vegetation through grazing by the Rabbit *Oryctolagus cuniculus*
Soil degradation and reduction of biodiversity through browsing and competition by feral goats *Capra hircus*
*Soil erosion and vegetation damage and disturbance in the alpine regions of Victoria caused by cattle grazing

Potential moderate significance for forest biodiversity
Spread of *Pittosporum undulatum* in areas outside its natural distribution
The spread of *Phytophthora cinnamomi* from infected sites into parks and reserves, including roadsides, under the control of a state or local government authority
Threats to native flora and fauna arising from the use by the feral honeybee *Apis mellifera* of nesting hollows and floral resources
Use of *Phytophthora*-infected gravel in construction of roads, bridges and reservoirs
Wetland loss and degradation as a result of change in water regime, dredging, draining, filling and grazing

Note: an asterisk (*) denotes potentially threatening processes for which there is an approved Action Statement.

4.1.3 Biodiversity 2037

Protecting Victoria's Environment – Biodiversity 2037 (the Biodiversity Plan) was published in 2017 as the new Flora and Fauna Guarantee Strategy for the purposes of the FFG Act.

In its 2021 audit, VAGO noted the move away from single species planning and management. Instead, DEECA's approach is increasingly to manage broad and pervasive threats to species habitats across larger connected geographical areas (landscapes) that provide benefits to multiple species, in balance with cost-effective bespoke actions to protect prioritised single species. This approach is based on scientific evidence that threats which occur across a landscape, such as invasive pests and animals, pose a common risk to many flora and fauna species. Treating extensive, rather than localised smaller areas, is also chosen on the basis that treatments are more likely to maintain intact ecological processes and support more species and larger populations.

A suite of products and tools have been developed by DEECA under the NaturePrint brand to help make effective investment and management decisions to deliver the Biodiversity Plan. The Strategic Management Prospects tool (SMP) has modelled the benefit of management actions to mitigate the threats from a range of invasive species. Adding to this work, VEAC commissioned specialist modelling and spatial analysis expertise for its Conservation Values of State Forests Assessment through ARI. In these assessments the analyses for foxes, deers and weeds were applied to 35 forest-dependent threatened species in the eastern Victorian forests The likelihood and consequences for biodiversity of 'too frequent' planned burning were also modelled. These represent sustained, inter-related threats that are likely accelerated and compounded by climate change. For example, frequent fires can exacerbate the extent and impact of weeds and pests and remove the capacity for a forest to naturally regenerate if trees are not mature enough to set seed.

4.1.4 Environment Protection and Biodiversity Conservation Act (Commonwealth)

As of July 2019, there were 56 EPBC Act listed fauna and flora species known or likely to occur within the Central Highlands RFA region. Since the commencement of the EPBC Act in 1999, 22 additional species known or likely to occur in the Central Highlands region have been listed as threatened under this legislation.

There are 14 threatening processes listed under the EPBC Act potentially affecting threatened species in Victorian RFA regions.[32] The Australian government has developed threat abatement plans for most of the key threatening processes registered under the EPBC Act where a threat abatement plan was considered a feasible, effective or efficient way to abate the process.

32 environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl

Table 4.3 EPBC Act listed key threatening processes potentially affecting threatened species in the Central Highlands RFA area

Potential high significance for forest biodiversity
Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners
Competition and land degradation by rabbits
Competition and land degradation by unmanaged goats
Dieback caused by the root-rot fungus *Phytophthora cinnamomi*
Fire regimes that cause declines in biodiversity
Infection of amphibians with chytrid fungus resulting in chytridiomycosis
Land clearance (excludes silvicultural operations in native forests)
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases
Novel biota and their impact on biodiversity
Predation by European red fox
Predation by feral cats
Predation, habitat degradation, competition and disease transmission by feral pigs
Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species

4.2 Climate change

The most notable change since the original comprehensive regional assessments more than 20 years ago is the increased understanding of accelerating climate change and its potential effects on biodiversity. Climate change is a risk accelerator, having uncertain but likely compounding and interacting impacts on other threating processes. Climate change can have gradual impacts, e.g. through warming, as well as will exacerbate and alter the nature of other threats, as well as driving more frequent and severe extreme events like fire, floods, and drought. Several substantial international and national reviews have documented the nature of the threats to biodiversity and continue to be updated, e.g. Steffan *et al* 2009 in Australia.[33]

While climate impacts will vary locally, Victoria's natural environments are already experiencing early impacts of a changing climate and these impacts are expected to increase through this century.[34] Victoria's climate has changed in recent decades, becoming warmer and drier. 2023 is Australia's hottest year on record. These changes are expected to continue in the future.[35]

Across Australia, climate change will increasingly affect terrestrial biodiversity and ecosystems through both gradual and sudden changes in response to the average climate (e.g. increased temperatures, decreased rainfall, changes to seasonality), and extreme events (increased hot days, fire, increased frequency and severity of cyclones, heat waves, intensified wet seasons). The

33 Steffen W, Burbidge AA, Hughes L, Kitching R, Lindenmayer D, Musgrave W, Stafford Smith M, Werner PA (2009) Australia's biodiversity and climate change: A strategic assessment of the vulnerability of Australia's biodiversity to climate change, Report to the Natural Resource Management Ministerial Council commissioned by the Australian Government. CSIRO Publishing

34 Victoria's Natural Environment Climate Change Adaptation Action Plan 2022-26

35 environment.vic.gov.au/natural-environment-adaptation-action-plan

effects of climate change on terrestrial biodiversity is having cultural, social, and economic impacts including loss of ecosystem services such as clean water, pollinators and amenity.[36]

For example, more frequent, and more intense fire across the Central Highlands forests will impact the water quality and water yield from the Melbourne Water catchments. Moreover, increasing fire frequency where fires occur before the regenerating plant has time to set seed (such as mountain ash and alpine ash which cannot survive a significant fire), may mean the extinction of that species in the area. Multiple threats due to climate change can impact the Central Highlands forests over a relatively short period of time; for example, an increase of severity and frequency of wildfires, reduction of rainfall, increasing in storm events (wind) and increase in temperature may combine to have unknown and unpredictable impact on species or the whole ecosystem. Trees that are under stress from these conditions may also be more susceptible to disease such as myrtle wilt. Another uncertainty is the acceleration of the degree in which change is occurring. The degree and extent to which these multiple and accelerating changes will have on the Central Highlands forests are unknown, but require significant efforts to monitor, build resilience and fund restoration, and should be considered in public land use categorisation to ensure adequate areas of key EVCs are protected.

At a national level, evaluating the synergistic impacts on terrestrial biodiversity of multiple drivers such as climate change, extreme events, land cover change, fire, invasive species, water availability and changing disease dynamics on ecosystems is becoming increasingly important. Synergistic impacts are particularly challenging in ecology and conservation, and require significant further multidisciplinary research that includes both biophysical and socio-political factors and sophisticated analytical approaches that integrate the variable contributions of stressors and their socioecological interactions.[37]

4.3 Forestry

Forestry in the Central Highlands forests will be a legacy use from January 2024 when native timber harvesting will cease. As such, and in spite of having had significant impacts (disturbance) on these forests (see tables 4.2 and 4.3), it can no longer be viewed as an ongoing threat. The focus for the future should be on restoration, protection and building resilience to the current and future threats outlined in this chapter.

4.4 Inappropriate fire regimes

In its discussion of managing threats to ecosystems the Biodiversity Plan states that, depending on their frequency and type, fires, including planned burning, can have significant positive or negative effects on biodiversity. Negative impacts on biodiversity can occur when fires are too frequent, intensive or extensive for recovery of the original ecosystem, such as ash forests, to occur. Climate change is driving more frequent and intense fires. Other factors such as increased population also increase fire frequency.

‘Fire regimes that cause declines in biodiversity’ is listed as a key threatening process under the EPBC Act (see table 4.3). It includes the full range of fire-related ecological processes that directly or indirectly cause persistent declines in the distribution, abundance, genetic diversity or function of species or ecological communities.[38]

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36 nccarf.edu.au/wp-content/uploads/2019/04/Impacts-on-Terrestrial-Biodiversity.pdf

37 Williams S. E., Falconi L., Lowe A., Bowman D., Garnett S., Kitching R., Moritz C., Christmas M., Boulter S. & Isaac, J. (2017) National Climate Change Adaptation Research Plan Terrestrial biodiversity: Update 2017. National Climate Change Adaptation Research Facility, Gold Coast.

38 DAWE (2022) Fire regimes that cause declines in biodiversity as a key threatening process, Department of Agriculture, Water and the Environment, Canberra.

In temperate Australia, the region's predominant eucalypt forests have been burned repeatedly by extensive wildfires since 2003. A 2015 review concluded that historical and recent evidence indicates that recurrent wildfires threaten the persistence of the 'fire sensitive' obligate seeder eucalypt forests, which can facilitate a shift to non-forest states if successive fires occur within the trees' primary juvenile period (1–20 years). The review also highlighted potential for structural and state changes in the 'fire tolerant' resprouter forests, particularly if recurrent severe wildfires kill seedlings and increase tree mortality.[39]

The Advice to the Federal Minister for the Environment from the Threatened Species Scientific Committee on the key threatening process also refers to prescribed or planned burning which may also affect biodiversity in the Central Highlands forests. One example given was Leadbeater's possum which preferentially occupy hollows in standing dead trees, many of which originate from fire-caused mortality, but which undergo accelerated rates of collapse when burnt in high or low severity fires. In other forest environments treated with low-severity prescribed burns, hollow-bearing trees declined by up to 26 per cent.

The extent, nature and relative benefit of planned burning, slashing or fire breaks to reduce or contain fire, versus the impact of such works on biodiversity remains contested and requires further research in the context of a warming climate.

In its discussion of managing threats to ecosystems the Biodiversity Plan states that, depending on their frequency and type, fires, including planned burning, can have significant positive or negative effects on biodiversity. Negative impacts on biodiversity can occur when fires are too frequent, intensive or extensive for recovery to occur. The threat of 'too frequent fire' will be exacerbated by climate change.

For the mountain ash forests of the Central Highland the main drivers of decline in trees 120 years or older (defined ecologically as old growth) are recurrent wildfire, widespread clearcutting, and a logging-fire interaction in which cut and then regenerated forests become more flammable and are at significantly elevated risk of burning at high (stand replacing) severity. Climate change is also a driver of decline in both through elevating the mortality of large old living trees and underpinning an increase in the frequency of high severity wildfire. [40]

4.5 Increasing population and human use

Increasing population is likely to lead to increased use of the state forests and other public land in the Central Highlands. If not carefully managed, increased use potentially threatens social and cultural values through competition or conflict between uses or may threaten environmental values through factors such as increased access or facilities and infrastructure development, spreading of weeds, disease and pests, and increased ignition of fires.

4.5.1 Population projections

Victoria, and specifically Melbourne, has experienced rapid population growth in recent decades. The closure of international borders during the emergency phase of the COVID-19 pandemic put a temporary stop to international immigration and drove changes in internal migration patterns.[41] However the reopening of the Australian border places Melbourne and Victoria back on the trajectory of significant growth, particularly in the outer suburbs of Melbourne that are close to the

39 Fairman Thomas A., Nitschke Craig R., Bennett Lauren T. (2016) Too much, too soon? A review of the effects of increasing wildfire frequency on tree mortality and regeneration in temperate eucalypt forests. International Journal of Wildland Fire **25**, 831-848.

40 Lindenmayer, D and Bowd, E (2022) Critical ecological roles, structural attributes and conservation of old growth forest: Lessons from a case study of Australian mountain ash forests. Frontiers in Forests and Global Change 5.

41 See the Australian Bureau of Statistics analysis of the impact of COVID-19 on Australia's population and components of growth in the year 2020 at abs.gov.au/articles/population-change-2020

Central Highlands. Changes in housing with smaller lots and more apartments with limited private open space are likely to be an ongoing driver of increased visitation by people who live in Melbourne to the forests of the Central Highlands.

At the 2021 Census, Victoria's population was 6.5 million up from 5.9 million in 2016. In 2021, almost four out of five people in Victoria lived in the capital city area of Greater Melbourne (4.9 million).[42]

Victoria in Future is the official state government projection of population and households. Projections are based on trends and assumptions for births, life expectancy, migration, and living arrangements across all of Victoria.[43] Victoria in Future 2023 (VIF2023) covers the period 2023 to 2051 for Victoria and the major regions. VIF2023 shows Victoria remains the fastest-growing state in the country with the population expected to reach 10.3 million by 2051.

4.5.2 Population pressures on public land

As well as increasing housing densities, dwelling change and infill development in metropolitan Melbourne, large subdivisions and estates in greenfield areas are being developed to meet increasing housing demand. The proximity of these subdivisions and estates to the Central Highlands is expected to result in increases to the number of people using the forests, parks and reserves in the wider region. If net movement of people from Melbourne to regional locations, such as those near the Central Highlands, is sustained, it would also be expected to increase use of the state forests in the future. Some information on increased levels and altered patterns of domestic tourism related to the COVID-19 travel restrictions is known, and anecdotally there are reports of increased visitation to parks, forests and other public land and open spaces close to where people live.

Victoria’s growing, urbanised and multicultural population is likely to have increased and changing demands on use of public lands, which may increase threats (see table 4.2). For example, there may be greater demands for easily accessed scenic, picnicking and passive recreational settings and opportunities. Conversely, more intensive active uses like mountain biking may continue to grow in popularity. Consideration will need to be given to maximising options for diverse, future uses of public land which can serve the recreational and wellbeing needs of Victorians as well as provide tourism business opportunities for local communities and protect the forests .

42 abs.gov.au/statistics/people/people-and-communities/snapshot-australia/2021

43 planning.vic.gov.au/guides-and-resources/data-and-insights/victoria-in-future

5. Public land use categories commensurate with the values of the Central Highlands state forests

This chapter is an interim response to the topic in (d) of the terms of reference: to identify the typical land use categories commensurate with the values of the Central Highlands state forests outlined in chapter 3. n

The approach for this assessment is outlined in section 5.2 and includes all state forests in the Central Highlands, including the Immediate Protection Areas (IPAs) put in place in November 2019 (see section 1.1).

A broad approach is required at this stage of the assessment due to the ecological complexity, the high levels of visitation and other social and economic values of the area. The final land use categories should incorporate the findings of biocultural assessments from the four Traditional Owner groups in the area, the results of the community engagement process being conducted by the Eminent Panel for Community Engagement (EPCE) and more detailed consideration of local areas and potential boundaries.

5.1 Overview of public land categories

Most modern states hold some land in government ownership (public land) and most Australian and international jurisdictions have developed systems of public land classification. For the purposes of VEAC's work, public land classification is the assignment of public land to specific purposes and uses, and the naming of the resulting public land categories.

Significant work is currently underway by the government to review and reform its public land legislation to better reflect Victorian needs and values. This followed government acceptance of VEAC's recommendation in its Statewide Assessment of Public Land (2017) that Victoria's public land legislation be rewritten. VEAC also recommended that a rationalised and consolidated system of public land use categories be adopted with 15 (reduced from 18) primary terrestrial categories and four marine categories, and that these revised public land categories and their purposes (or objectives) be aligned with the various Acts reserving land.[44] The government accepted this recommendation in principle, noting that there may need to be minor refinements to some categories and purposes, and further targeted consultation.

VEAC also recommended explicitly stating that one of the central purposes of public land (all categories) is to protect the rights and interests of Traditional Owners, native title holders and Aboriginal Victorians, and their cultural values. A consultation paper was released by the Victorian government in 2021 seeking comment on proposals to renew Victoria's public land legislation, including the creation of a new Public Land Act and amending and modernising the *National Parks Act 1975* to work alongside the Public Land Act.[45] The Public Land Act will replace the *Land Act 1958*, the *Crown Land (Reserves) Act 1978* and the *Forests Act 1958*.

During this period, the Victorian government committed to advancing Aboriginal self-determination for Traditional Owners and other Aboriginal Victorians, including in relation to land, water, and cultural heritage rights. The reform of Victoria's public land legislation is an opportunity to enable Traditional Owners' self-determination by reframing the legislation and addressing key gaps and limitations in Victoria's public land legislation that currently limit this. For example, the *Victorian Traditional Owner Cultural Landscapes Strategy* prepared by Traditional Owner Corporations and Traditional Owner knowledge holders proposes that public land legislation provide for cultural reserve and cultural landscape categories that enable collaborative management to guide decisions and practices for land and water management across the state.[46]

44 veac.vic.gov.au/investigations-assessments/previous-investigations/investigation/statewide-assessment-of-public-land

45 engage.vic.gov.au/renewing-victorias-public-land-legislation

46 Victorian Traditional Owner Cultural Landscapes Strategy, https://fvtoc.com.au/sections/landscapes/

5.2 Analysing and identifying typical land use categories

In making recommendations for public land use, VEAC generally considers the following:

- specific directions of government, if any, and legislative requirements
- pattern and significance of values including natural values, Aboriginal and non-Aboriginal cultural values, resource uses and other economic activities, licensed uses, recreational and other social values
- size of area and boundaries of area including shape (e.g. linear, fragmented) that may affect management viability
- regional and local context including adjacent or nearby areas of public land, including their values and uses
- the environmental, social and economic implications of implementing land use changes including consideration of community views
- ease of public understanding e.g. avoiding unnecessary complexity in allowed uses or boundaries.

VEAC also adopts the principle where possible of avoiding foreclosure of future options for environmental protection and, increasingly, the need for resilience and adaptation in the face of climate change.

Following collection and analysis of the best available information and consultation with stakeholders, VEAC maps the public land use category or categories which have the best alignment of purpose and allowed uses and activities with identified values for the areas under assessment.

In previous investigations, VEAC formally seeks public comment on the draft recommendations before finalising recommendations to government. VEAC has not been requested to conduct public consultation or receive submissions on this report. For this assessment of the Central Highlands state forests, the EPCE has been appointed to undertake community engagement using this interim VEAC assessment and to provide final advice to government on future public land use.

Information is available for many of the values of the Central Highlands state forests as outlined in chapter 3. It is expected that prior to VEAC's full report to the Minister to be submitted in July 2024, the Traditional Owner groups in the Central Highlands region will provide information on biocultural values. In addition, there will be significant additional perspectives and information to be incorporated into the final assessment following the EPCE's engagement process including:

- additional information on levels and patterns of visitation and recreational use, and
- socio-economic implications and the views of key stakeholders about existing and potential future values.

5.3 Proposed land use categories for the Central Highlands state forests

For this Central Highlands assessment, VEAC has compiled and analysed information on the values of state forests to categorise broad tracts of state forest according to environmental and ecological values, some social and economic resource values, and the types and patterns of land use.

In making these proposals, the following broad principles drive decision making.

1. Where an area has high environmental values and few conflicting current and potential uses, a protected area category such as national park is commensurate with the environmental values and is unlikely to compromise uses.
2. Areas with high environmental values and high values for uses that would conflict with protected area status such as minerals extraction and hunting require more information, often at a finer spatial scale, and intensive stakeholder consultation before determining public land use categories.
3. Public land use categories for areas with lesser environmental values and fewer conflicting uses will depend on finer spatial detail on landscape characteristics and the types and level of uses. Further information from community engagement will be required to obtain this detail.
4. For areas with lesser environmental values and high values for uses that would conflict with protected area status, a category such as regional park or forest park is commensurate with the values.

Management considerations such as those outlined in section 5.2 were also considered where possible in the mapping of proposed land use categories.

Several activities have the same conditions across all public land use categories likely to be under consideration, for example:

- native timber harvesting in Victoria's state forests will be prohibited in all public land use categories after 1 January 2024
- apiculture is allowed in all public land use categories
- the rules for four-wheel driving and trail bike riding are the same across public land use categories.

Four existing public land use categories were identified as potentially broadly commensurate with the identified environmental, cultural heritage, social and economic values and uses of the Central Highlands state forests: national park, conservation park, forest park and regional park.
A description of the characteristics and purpose of each of these categories is included in table 5.1 together with comments that may influence their suitability. An additional consideration is the need to protect the rights and interests of Traditional Owners and native title holders and their cultural values, which existing public land use categories do not address. However, as noted, the current reforms to public land legislation and Victoria's commitment to Aboriginal self-determination may lead to different models for public land categories such as national parks, including how they are managed.

Table 5.1 Assessment of typical public land use categories

Public land category	Characteristics and purposes	Comments
National park	Extensive area or areas often with national significance with outstanding natural values and diverse land types contributing to representativeness of parks and reserves in the state. **Purposes** • Protect the natural environment including biodiversity • Protect and maintain natural, cultural, or historic places or features, and natural landscapes • Provide opportunities for informal recreation associated with the enjoyment of nature, or education, where consistent with the purposes above.	• national parks are generally larger and more intact • consistent with the outstanding biological and ecological values of the Central Highlands and improves protected area representation of under-represented EVCs (e.g. Cool Temperate Rainforest) and threatened species habitat • some recreational activities are not usually allowed in national parks (e.g. walking and camping with dogs, horse riding) • exempt Crown land for the purposes of mineral resources legislation i.e. generally not available for new exploration or mining (compared with restricted Crown land for other protected areas)
Conservation park	Land often linear in shape (e.g. coastal park) with natural features, flora and fauna of landscape or conservation significance **Purposes** • Protect the natural environment including biodiversity • Protect and maintain natural, cultural, or historic features and natural landscapes • Provide opportunities for informal recreation associated with the enjoyment of nature, and education, where consistent with the purposes above.	• can accommodate a low level of recreational activities more restricted in national parks (e.g. horse riding, dogs)
Forest park	Area of native forest providing opportunities for recreation and minor extraction of some natural resource products **Purposes** • Provide opportunities for recreation and education • Protect the natural environment including biodiversity • Supply water and protect catchments and streams. • Protect and maintain natural, cultural, or historic features and scenic landscapes • Provide for a range of forest uses including the supply of forest products, but excluding sawlogs and pulpwood.	• accommodates wide range of recreational uses • accommodates some firewood collection, hunting, mining and prospecting • category often applied to less heavily visited areas compared with regional park • not categorised as a protected area

Public land category	Characteristics and purposes	Comments
Regional park	Extensive areas of natural or semi-natural land close to population centres or major tourist routes or easily accessible areas **Purposes** • Provide opportunities for informal recreation for large numbers of people associated with the enjoyment of natural or seminatural surroundings or semi-natural open space • Protect and maintain natural or semi-natural features and scenic landscapes • Protect the natural environment including biodiversity to the extent consistent with the above.	• accommodates range of recreational uses (excluding hunting, firewood collection) • category usually applied to areas with higher visitation • not categorised as a protected area

5.4 Conclusion

There are six broad tracts of state forest, each with a combination of environmental values and potentially conflicting uses that fits broadly into one of the four quadrants of the graphic presented in figure 5.1 below. These are mapped as units 1 to 6 in figure 5.2. Further work from Traditional Owner groups and the EPCE will be needed to incorporate social and cultural values into this framework to produce final recommendations to government.

Figure 5.1 Matrix illustrating levels of environmental values and uses potentially conflicting with protected area designation

		Environmental values →	
		low	**high**
Conflicting uses ↓	**low**	• points towards several options for public land use categories - requires more information and/or finer spatial detail **Unit 5**	• points toward greater environmental protection in a protected area such as a national park **Units 1,3 and 4**
	high	• points toward a public land use category that is not necessarily a protected area such as forest park or regional park **Unit 2**	• requires more information through community engagement, finer spatial detail and/or novel or customised solutions **Unit 6**

As described in section 5.1 the existing reform of Victoria's public land legislation is likely to further Traditional Owners' self-determination by creating categories of public land use enabling Traditional Owner cultural practices and providing opportunities for direct management by Traditional Owners of public land including land under the National Parks Act.

A large protected area such as a national park is commensurate with the outstanding natural values of units 1, 3 and 4 depicted and would link the existing Yarra Ranges, Kinglake, Lake Eildon and Baw Baw national parks and the Bunyip, Cathedral Range and Moondarra state parks. There are relatively few uses that would conflict with the national park designation, although this is an area

that the EPCE should explore further with the community during its engagement period. This area encompasses the full range of major forest types and landscapes of the Central Highlands public lands from the sandier soils and lowland forests of the south – with their affinities to East Gippsland – to the drier forests of the north, almost to the Goulburn River near Molesworth. In between there are subalpine plateaus and peaks and the famous wet montane ash forests and rainforests that characterise the region.

Unit 6 is also a sizeable area of outstanding natural values commensurate with a national park designation and provides an additional opportunity to link to the Yarra Ranges National Park to the west. More detailed consideration is required however due to the potentially high value for uses that would conflict with protected area status such as mineral extraction. It is an area VEAC suggests the EPCE explore further during its engagement period. This area covers the upper Thomson Catchment with its crucial importance for water supply. Generally remote, south-facing slopes and ridges drain montane and lower wet and damp forests, as well as heathy dry and herb-rich foothill forests, to riparian forests along waterways.

Unit 2 in the northeast of the Central Highlands assessment area has moderate natural values and, while it could provide an opportunity to link the Yarra Ranges and Lake Eildon national parks, the area has a high level of uses not generally compatible with national park status such as hunting, and high values for incompatible uses such as minerals extraction. A public land category such as forest park or regional park would be commensurate with the values and allow for these uses. With generally north-facing slopes and ridges, this area is like a drier version of unit 6 but with more dry woodland amongst the montane damp forests and more shrubby dry forest amongst the herb-rich foothill forests of the lower slopes. The catchments of the Big and upper Goulburn rivers supply relatively reliable water to Lake Eildon.

For Unit 5 in the west of the area north of the Kinglake National Park, there are several public land categories commensurate with the broadly lower natural values and lower level and variety of uses that would conflict with protected area designations. More detailed information, including information from community engagement, is required for this unit. While there are damp forests at higher elevations such as on Mount Disappointment, drier forests – with affinities to places further north such as the Strathbogie Ranges – are more characteristic of this area: in particular, herb-rich foothill and grassy dry forests.

Precise boundaries are not depicted. While some will be clear due to the boundary with adjacent land such as existing national parks or obvious topographical or geographic features such as rivers or roads, others will need more information including information from stakeholders provided during the EPCE's consultation and from land managers. VEAC will continue to collaborate with land managers and with the EPCE during its engagement period from early 2024 to further define these boundaries where possible in its final report in July 2024.

After tens of thousands of years of being cared for by Traditional Owners, the forests have been significantly impacted since colonisation by activities like logging and land clearing. They now face they accelerating, uncertain impacts of climate change, with fire frequency and intensity likely to be critical to shaping future ecosystems and values. For all public land categories, sufficient management resources are required for active and adaptive management to restore and maintain values and build resilient healthy forests.

VEAC is confident that this interim assessment provides strong guidance for the EPCE as it undertakes its community engagement program on the future of the Central Highlands forests.

Figure 5.2 Suggested land use groupings commensurate with the values of the Central Highlands state forests