



Victorian
Environmental
Assessment
Council

Assessment of the values of the Strathbogie Ranges Immediate Protection Area

Taungurung Country

MARCH 2022



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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Errata

- p iii – page numbers for sections 2.1 and 2.2 changed from '2' to '12'
- p 10, line 4 – replaced 'Millennium Development Goals' with 'Sustainable Development Goals'
- p 48, section 3.5.9, line 2 – changed 'figure 3.11' to 'figure 3.13'
- p 49 – changed caption from 'Figure 3.11' to 'Figure 3.13'
- p 60, line 3 below table – changed 'figure 5.1' to 'figure 2.1'
- p 64, Appendix 1 – deleted caption 'Table A1.1 Terms'
- p 75, Appendix 3, A6 – changed 'record' to 'records' in caption

To improve image quality, the following map was redrafted:

- Figure 1.3

Photo credit: Cover photo (left) courtesy of the Taungurung Land and Waters Council

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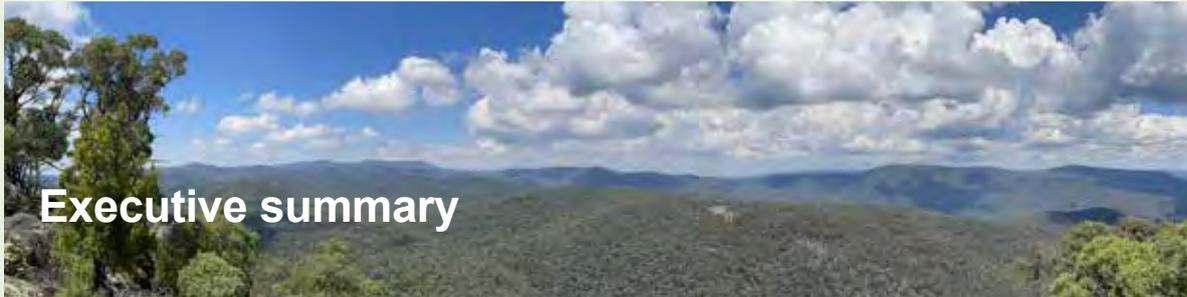
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Acknowledgement of Aboriginal Victorians

The Victorian Environmental Assessment Council pays its respects to Victoria's Aboriginal peoples, Native Title Holders and Traditional Owners and acknowledges their rich cultural and intrinsic connections to Country. Council recognises that the land and sea is of spiritual, cultural, environmental and economic importance to Aboriginal people and values their contribution and interest in management of land and water.

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In November 2021, the Victorian Environmental Assessment Council (VEAC) was requested by the Minister for Energy, Environment and Climate Change, the Hon Lily D'Ambrosio MP, to carry out an assessment of the values of state forests in the areas identified as Immediate Protection Areas (IPAs) in the Strathbogrie Ranges and Mirboo North.

The IPAs were put in place in November 2019 alongside the Victorian Forestry Plan and the announcement by the Victorian government that timber harvesting would end in Victoria's native forests by 2030. Environmental protections that were announced included the immediate protection from commercial timber harvesting of 96,000 hectares of state forest in eastern Victoria. The IPAs are in the Strathbogrie Ranges, Central Highlands, East Gippsland and near Mirboo North.

In 2021 the government announced that VEAC will undertake scientific assessment of the IPAs and community consultation will be undertaken by an Eminent Panel for Community Engagement (EPCE) on the future uses of State forest in eastern Victoria. The assessment of the IPAs will be delivered in two phases with phase 1 covering IPAs in the Strathbogrie Ranges and near Mirboo North.

VEAC is not undertaking community consultation or receiving submissions on this assessment.

The final assessment, including VEAC's assessment of the potential economic implications of proposed land use changes recommended by the EPCE, will be submitted to the Minister by 31 May 2022.

This report provides an assessment of the Strathbogrie Ranges IPA.

Scope of the assessment

The assessment will inform the work of the EPCE in its provision of advice and recommendations to the Minister for Energy, Environment and Climate Change on the future uses of the IPAs and State forest in eastern Victoria.

The purpose of the assessment 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 EPCE and provided to the Council

This report addresses topics (a) to (d) of the terms of reference for the Strathbogrie Ranges IPA 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 both the Mirboo North and Strathbogrie Ranges IPAs in its full report to the Minister by 31 May 2022.

VEAC's approach to the assessment

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

VEAC has also reproduced in this report the direct input of the Taungurung People as the Traditional Owners of the Country that includes the IPA. This is a step towards enabling a dialogue between Traditional Owners and VEAC within a framework that does not exclude either the Indigenous or the 'western' world view using cultural landscapes as a bridging tool.

Strathbogie Ranges Immediate Protection Area

The Strathbogie Ranges IPA is made up of the entire Strathbogie State Forest located about 120 kilometres north east of Melbourne, east of the Hume Highway at Euroa. Several small townships are nearby including Strathbogie, Swanpool and Violet Town. Benalla lies to the north and Mansfield to the south east.

The Strathbogie Ranges is estimated to cover an area of about 240,000 hectares north of the Great Dividing Range situated between the Goulburn River to the west, the Broken River to the east and the Hume Highway to the west and north. Surrounding areas are largely cleared for mixed farming and grazing, softwood plantations and rural residential lifestyle properties.

The IPA is approximately 24,000 hectares of public land, currently classified as state forest, of which 5000 hectares is Special Protection Zone. The Toorour and Glen Creek reference areas, the Lima South education area, and a small inlier of the Tallangalook-Dry Creek historic area are also within the boundary of the IPA.

Areas of public land around the IPA include Reef Hills State Park to the north near Benalla, the Tallangalook-Dry Creek Historic Reserve abutting the IPA to the south, Mount Samaria State Park and Tolmie-Toombullup state forests to the east across the Midland Highway, and the Mount Wombat-Garden Range Nature Reserve to the west.

Nearly 80 per cent of the IPA is within the Highlands - Northern Fall (HNF) bioregion. The remainder, in patches towards the northern and eastern edges of the IPA, is in the Central Victorian Uplands bioregion.

The Taungurung are the recognised Aboriginal rights holders over more than 20,000 square kilometres in central Victoria including the area of the Strathbogie Ranges IPA. The State of Victoria has a Recognition and Settlement Agreement with the Taungurung People. The Taungurung Land and Waters Council (TLaWC) is a Registered Aboriginal Party for the purposes of the *Aboriginal Heritage Act 2006*.

Previous major assessments of public land including the area of the Strathbogie Ranges IPA are:

- North-eastern Area (Benalla-Upper Murray) Review Final Recommendations (LCC, 1986)
- North East Regional Forest Agreement Comprehensive Regional Assessment (Commonwealth of Australia, 1998) and Further Assessment of Matters (State of Victoria and Commonwealth of Australia, 2019).

Summary of values

Values, rights and interests of Traditional Owners

A report from TLaWC providing the results of an assessment of the Strathbogrie Cultural Landscape is reproduced in this report.¹

The Strathbogrie Cultural Landscape is central to Taungurung Country and an area of high cultural significance before and during the colonial period.

Biodiversity and ecological values

- The Strathbogrie Ranges are a distinct outlier to the northwest of the main Dividing Range in northeast Victoria, of similar biodiversity value to comparable areas of the main range. In the context of the rest of the Strathbogries which are mostly cleared, the IPA comprises the largest remaining consolidated area of highest biodiversity value, despite the incursion of pine plantations into the landscape. Within the IPA, the areas of highest biodiversity value are mostly in the northern third.
- The IPA contains the headwaters of Seven Creeks – a waterway of very high strategic biodiversity value.
- It is a key site for the threatened southern greater glider, eastern horseshoe bat, grey rice-flower, tall leafy greenhood, and hairy hop-bush.
- The IPA is known or is likely to make a valuable contribution to the conservation of the threatened brush-tailed phascogale, powerful owl, and Murray spiny crayfish.
- Compared to the rest of the Strathbogries, the forests of the IPA are in generally good condition. This is despite a long history of various uses and some weed invasion particularly in the southwest and along the northern edges. The forests of the tableland, approximately between Mt Barranhet and Mt Strathbogrie, are outstanding in terms of their condition. They have an abundance of large hollow-bearing trees and fallen wood, and minimal evidence of disturbance. They are also likely to be among the forests most resilient to climate change in this part of Victoria.
- Including areas of the IPA into the protected area system in both Central Victorian Uplands bioregion (mostly in the northern third of the IPA) and Highlands - Northern Fall bioregions would contribute to meeting nationally agreed comprehensiveness, adequacy and representativeness (CAR) targets.

Social and economic values

Recreational use of the forest includes activities such as camping, four-wheel driving, horse riding, trail bike riding, bushwalking, birdwatching, hunting and scenic driving. There are several established but low-key visitor sites, including picnic areas and campgrounds, walking tracks and lookouts. Parts of the IPA have rich historical associations with gold mining and timber harvesting.

Current resource uses and other licensed uses of the IPA include two quartz mines, apiculture, domestic firewood collection, grazing licences in the northern area of the IPA, adjacent education camps, and licensed tourism operations.

Summary of threats

Threats and threatening processes include:

- Climate change - hotter days (especially during the summer months) and warmer night temperatures, more days over 35 degrees Celsius and less rainfall annually (especially during spring and winter) but a greater likelihood of summer storms and heavier downpours are all projected for the Hume region
- Invasive plant and animal species (such as blackberry and deer)
- Wildfires and planned burning

¹ A language name for the cultural landscape is currently being considered by the Taungurung.

- Further loss and fragmentation of habitat putting greater pressure on remaining habitat in an already extensively cleared bioregion
- Growing regional community leading to more recreational/human use pressures
- Illegal firewood collection including tree felling
- Soil disturbance and creation of unplanned tracks from illegal off-track vehicle use eg. trail bikes and mountain bikes.

Public land use categories commensurate with the identified values of the Strathbogrie Ranges IPA

An overview of public land categories in Victoria is provided in sections 5.1 and 5.2. This includes an outline of the process for determining the public land use category or categories which best align with the purpose and allowed uses and activities for the Strathbogrie Ranges IPA. A summary of the analysis is provided in sections 5.3 and 5.4.

Council acknowledges that the report provided by Taungurung and reproduced in section 3.1 of this report is proposing a different approach to that arrived at by VEAC through its assessment and summarised below. VEAC supports this discussion continuing through the engagement processes of the EPCE. This will enable a shared understanding to be reached regarding the possible management, planning and governance arrangements for the different public land categories while the landmark reforms to Victoria's public land legislation are further developed and finalised.

Conservation park is considered the most appropriate public land use category commensurate with the values of the central and northern parts of the Strathbogrie Ranges IPA. For the remaining southwestern part of the IPA, **forest park** is considered the most appropriate land use category.

Areas of the IPA in a conservation park would be managed for the protection of their natural and cultural values, while allowing access for a range of recreational activities. Important threatened species habitat, including many large, hollow-bearing trees, would have a high level of protection. Under-represented EVCs, including those in the Central Victorian Uplands bioregion in the northern part of the IPA and in the east near Lake Nillahcootie, would be added to the protected area system.

Forest park in the southwestern part of the IPA would facilitate continued use of the forest for a broad range of activities and could accommodate firewood collection, hunting, mining and recreational prospecting.

There are significant gaps and limitations in the current legislation that pose barriers to enabling Traditional Owners' self-determination and supporting cultural land management, and the current public land legislation reforms provide an opportunity to address these. VEAC supports the future incorporation of Traditional Owners' thinking about cultural landscapes into the categorisation and management of the Strathbogrie Ranges native forests, as well as reforms that enable Traditional Owners to directly manage land.



In November 2021, the Victorian Environmental Assessment Council (VEAC) was requested by the Minister for Energy, Environment and Climate Change, the Hon Lily D'Ambrosio MP, to carry out an assessment of the values of state forests in the areas identified as Immediate Protection Areas (IPAs) in the Strathbogrie Ranges and Mirboo North.

This report provides an assessment of the Strathbogrie Ranges Immediate Protection Area. A full report will be provided to the Minister by 31 May 2022.

VEAC is not undertaking community consultation or receiving submissions on this assessment. See the following sections 1.1 to 1.4 for details of the process for community engagement on the information in this report.

1.1 Background to the assessment

The current assessment of IPAs originated with the Victorian government's announcement in November 2019 that timber harvesting would end in Victoria's native forests by 2030 following a managed 10-year transition to an entirely plantation-based timber supply. The Victorian Forestry Plan (VFP) was developed to assist the industry as it manages its gradual transition away from native forest harvesting.² Under the 30-year plan, a funding package will provide support for workers, businesses and communities.

Alongside this announcement the Victorian government announced environmental protections including the immediate protection from commercial timber harvesting of 96,000 hectares of state forest in Immediate Protection Areas (IPAs). The IPAs support the protection of critical habitat for more than 35 forest-dependent species, including the southern 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 southern greater glider, listed as threatened in 2017, and included an indicative map of the IPAs.³

² https://djpr.vic.gov.au/__data/assets/pdf_file/0012/2042040/13318-VIC-Forestry-Plan_V2_FA_WEB.pdf

³ https://www.environment.vic.gov.au/__data/assets/pdf_file/0019/440371/267-Greater-Glider-2019-Action-Statement.pdf

The IPAs are located in the Strathbogie Ranges, Central Highlands, East Gippsland and near Mirboo North (see figure 1.1).

Figure 1.1 Immediate Protection Areas in eastern Victoria



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.

In August 2021 the Victorian government announced that VEAC will undertake a scientific assessment of environmental, biodiversity and other values in areas identified as Immediate Protection Areas, and that the assessment will be made available to the public and will provide advice on appropriate land tenure for the IPAs. The government also announced that community consultation will be undertaken by an Eminent Panel for Community Engagement (EPCE) on the future uses of State forest in eastern Victoria to be chaired by Karen Cain and including the formal representation of VEAC.⁴

The EPCE was formally established by the Minister for Energy, Environment and Climate Change in January 2022.⁵ Formally recognised Traditional Owner groups relevant to each region will be appointed to the panel during the engagement process for each Immediate Protection Area on their Country.

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.

The membership of the EPCE for phase 1 and more information about the panel is available at <https://www.delwp.vic.gov.au/futureforests/immediate-protection-areas/eminent-panel-for-community-engagement>. The panel will present a report and recommendations to the government on Mirboo North and Strathbogie Ranges in mid-2022. Terms of reference for VEAC's phase 2 assessment of the Central Highlands and East Gippsland are expected in mid 2022 with community engagement by the panel to begin later in 2022.

4 Media release <https://www.lilydambrosio.com.au/media-releases/protecting-victorias-forests-and-threatened-species/>

5 <https://www.premier.vic.gov.au/next-steps-guide-future-our-protected-forests>

VEAC's current assessment covers phase 1 and includes an assessment of the Mirboo North and Strathbogrie Ranges IPAs. The assessment will be presented in individual reports for the two IPAs to facilitate community engagement.

This report addresses the purposes in (a) to (d) of the terms of reference for the Strathbogrie Ranges IPA.

1.2 Terms of reference

On 25 November 2021, the Minister for Energy, Environment and Climate Change requested VEAC to assess the values of state forests in the Immediate Protection Areas in the Strathbogrie Ranges and Mirboo North. See box 1.1 for the terms of reference. The terms of reference were tabled in Parliament and gazetted on 2 December 2021.

Box 1.1 Terms of reference

Pursuant to section 26B of the *Victorian Environmental Assessment Council Act 2001*, the Minister for Energy, Environment and Climate Change hereby requests the Victorian Environmental Assessment Council (the Council) to carry out an assessment of the values of state forests¹ in the Immediate Protection Areas (IPAs) in the Strathbogrie Ranges and Mirboo North² as shown on the accompanying map.

The assessment will inform the work of an Eminent Panel for Community Engagement (EPCE) in its provision of advice and recommendations to the Minister for Energy, Environment and Climate Change on the future uses of the Immediate Protection Areas and 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 EPCE 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 and the economic implications of the proposed recommendations of the EPCE. Public consultation and recommendations are not required.

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

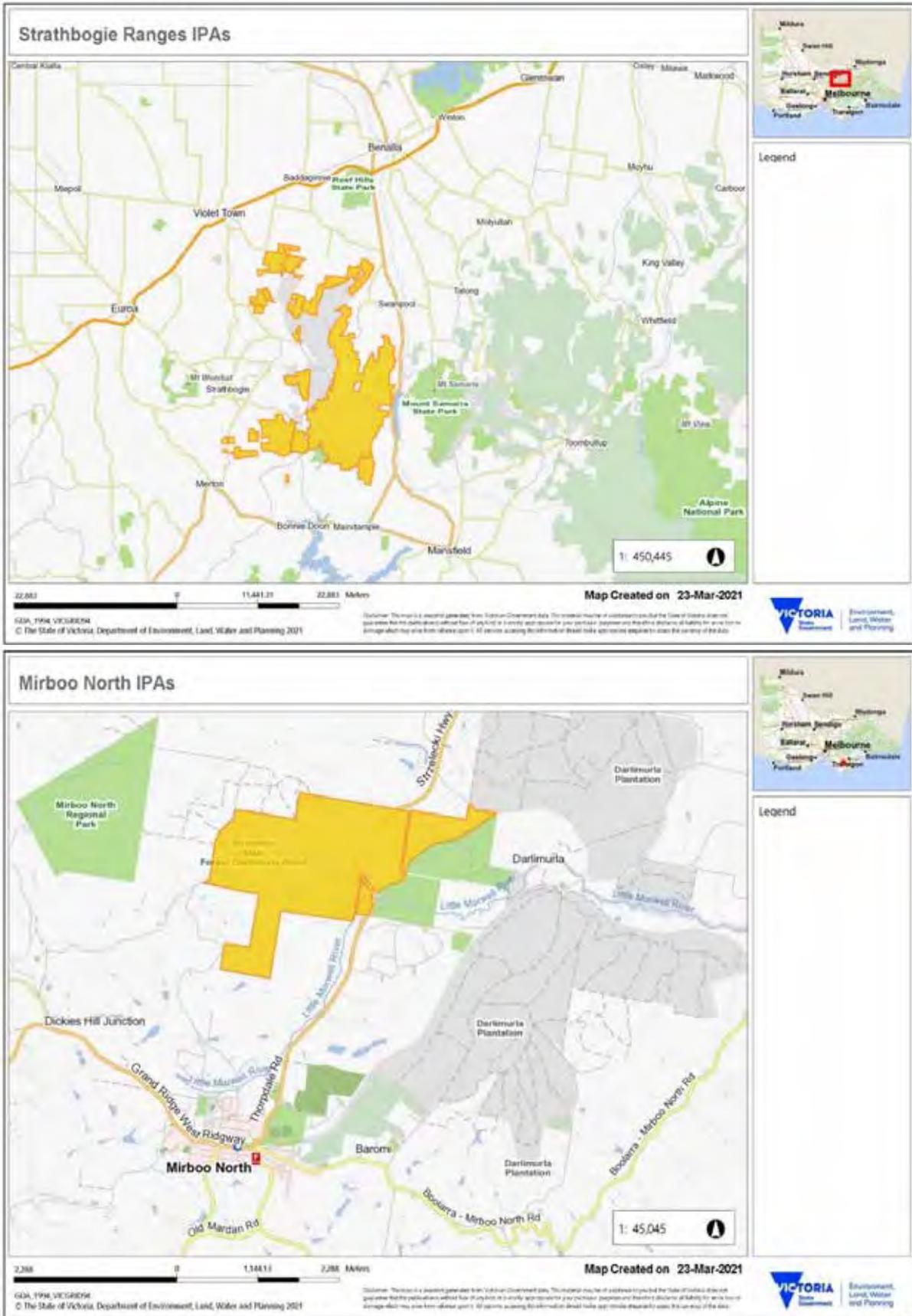
The Council must publish its assessment of the matters specified in paragraphs (a) to (d) above by 31 March 2022* and submit a report on the completed assessment by 31 May 2022.

¹ For the purposes of this assessment, 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 DELWP forest zoning data set (FMZ 100) as at the time of commencement of the assessment.

² 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.

*originally 28 February 2022

Figure 1.2 Map accompanying the terms of reference: Immediate Protection Areas in the Strathbogie Ranges and Mirboo North (orange shading)



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 Energy, Environment and Climate Change. 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 substantially 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 state forest was requested pursuant to section 26B of the VEAC Act.

The current five members appointed to VEAC are Mellissa Wood (Chairperson), Joanne Duncan, Anna Kilborn, Nicola Ward and Nick Wimbush. A brief biography of each 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

The full process to provide advice to government on the future uses of State forest in eastern Victoria involves scientific assessments undertaken by VEAC and community engagement on the assessments to be undertaken by an Eminent Panel for Community Engagement (see sections 1.1 and 1.2). The work will be undertaken in two phases as outlined in section 1.1. The assessment of the Mirboo North and Strathbogie Ranges IPAs is part of phase 1.

The provisions of the VEAC Act under which this assessment was requested do not include mandatory consultation requirements or the release of draft reports for public comment. 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 the Strathbogie Ranges IPA 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 both the Mirboo North and Strathbogie Ranges IPAs in its full report to the Minister by 31 May 2022.

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 together with the relevant links to the EPCE processes.

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 (EPCE) 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 assessment of Mirboo North and Strathbogie Ranges IPAs for the matters specified in paragraphs (a) to (d) in terms of reference
	April – May 2022 tbc	EPCE conducts community engagement informed by VEAC's assessment
	May 2022 tbc	EPCE provides proposed land use changes to VEAC
	May 2022 tbc	VEAC assesses the potential economic implications of EPCE's proposed land use changes as specified in (e) in terms of reference
	31 May 2022	VEAC submits full report to Minister addressing (a) to (e) in terms of reference
	Mid 2022	EPCE submits Phase 1 report to the Minister
	7 June 2022 tbc	VEAC report publicly released
Phase 2	Mid-2022 tbc	Terms of reference provided to VEAC for assessment of the values of IPAs in Central Highlands and East Gippsland and future use and management of State forests in eastern Victoria
	tbc	VEAC report due
	tbc	EPCE report due

1.5 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, meetings with land managers and resource managers, and from community groups and forest users where available. Statements of Aboriginal cultural heritage values, rights and interests have been provided to VEAC by the Traditional Owners of the land.

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 DELWP's Arthur Rylah Institute for Environmental Research 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.

Details of information sources are provided in the relevant sections of this report, in appendices in this report and in information on the VEAC website.

1.6 Overview 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

DELWP estimates that Victoria has approximately 8.2 million hectares of forests, including native forest and plantations on public and private land. Approximately 81 per cent of Victoria’s forested land is estimated to be Crown land. In addition, private landholders manage 1.45 million hectares of forest of which around 422,000 hectares are plantations.

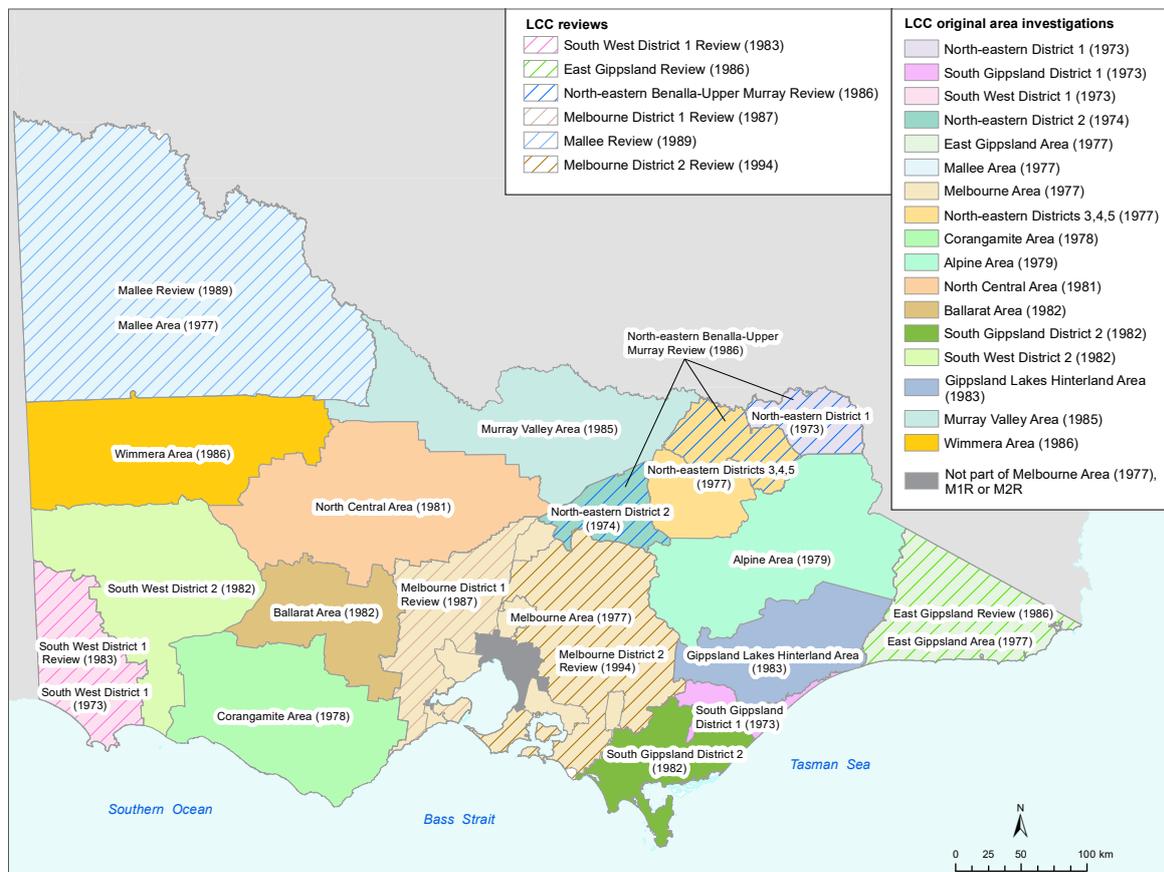
1.7 Past studies

LCC , ECC and VEAC investigations and assessments

For 50 years the role of VEAC and its predecessors, the Land Conservation Council and the Environment Conservation Council, 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.

Figure 1.3 LCC study areas



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

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 1.3.

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 inappropriate uses that are not permitted.

Recommendations for the Strathbogrie Ranges were included in the LCC's North-eastern Area (Benalla-Upper Murray) Review Final Recommendations (1986), and accepted by government, with the area categorised as follows:

- state forest
- softwood production (not included in the IPA)
- Toorour and Glen Creek reference areas
- Lima South education area
- Tallangalook-Dry Creek historic area (not included in the IPA).

VEAC investigations 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.

Regional Forest Agreements

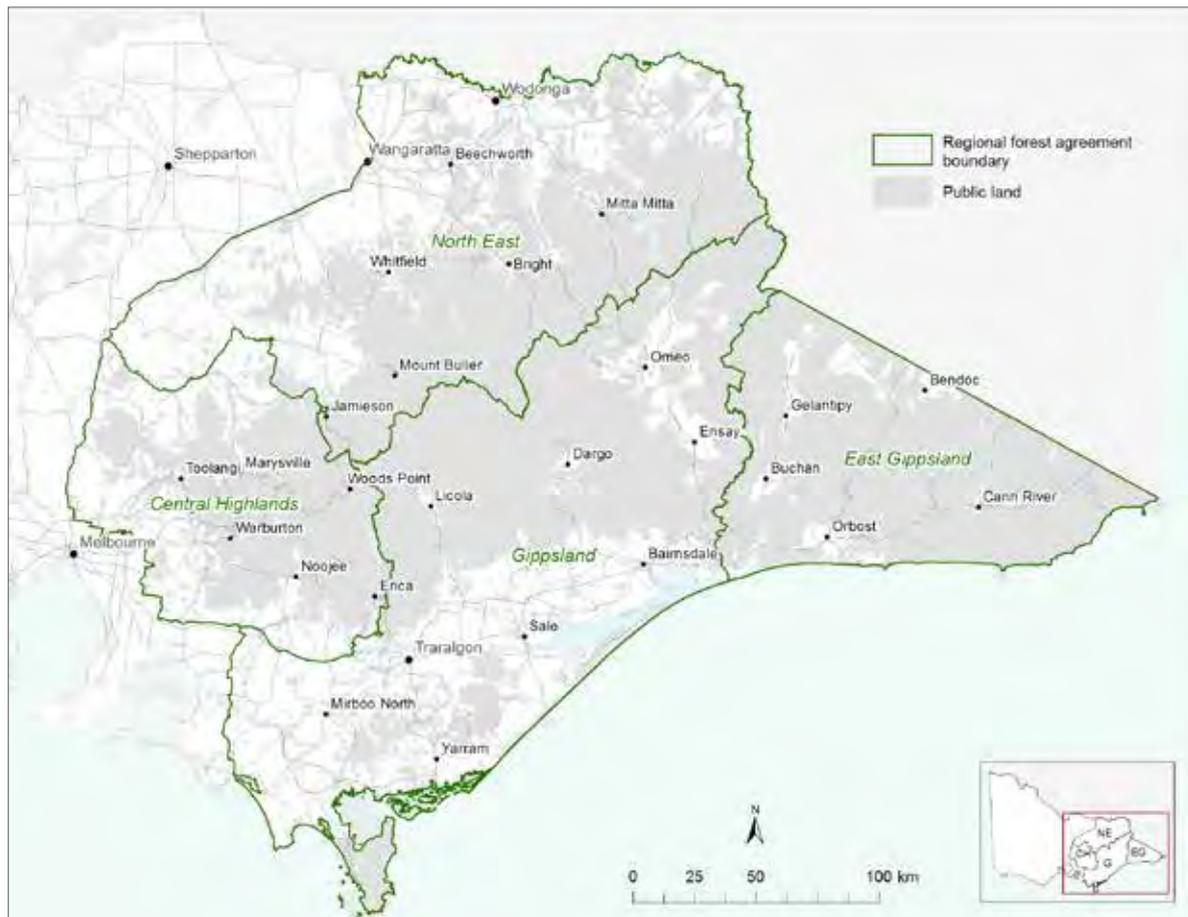
At the national level, the National Forest Policy Statement, first published in 1992, sets out a nationally shared vision for the ecologically sustainable management of Australia's forests.

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 the relevant region. The CRA considered timber production, regional employment, biodiversity conservation, wilderness, water catchment protection, tourism, recreation, and cultural and heritage values.

Victoria's regional forest agreement areas are shown in figure 1.4.

The Strathbogrie Ranges IPA lies within the North East RFA area.

Figure 1.4 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. A consultation summary report for the North East region can be viewed at <https://www.awe.gov.au/sites/default/files/documents/consultation-summary-report-north-east.pdf>

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.

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 is being overseen by an independent Panel and is currently underway. 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.⁸

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

⁸ https://www.delwp.vic.gov.au/_data/assets/pdf_file/0023/542156/Summary_Report_May_2021_-_Accessible_Version_002.pdf

1.8 Victoria's protected area system

Protected areas – national parks, wilderness areas, nature conservation 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 Convention on Biological Diversity 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 Convention on Biological Diversity the Australian and Victorian governments are committed to establishing a representative protected area system. For terrestrial areas, this is largely achieved through the National Reserve System (NRS). The NRS is a formally-recognised, national network of protected areas which cover terrestrial and inland freshwater ecosystems. It is complemented in marine environments by the National Representative System of Marine Protected Areas (NRSMPA). The NRS and the NRSMPA processes incorporate the broad requirement for a comprehensive, adequate and representative protected area system. This is commonly referred to as the 'CAR' system. 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.⁹

While the CAR system for protected areas in Victoria has its origins in forest policy of the 1990s and a CAR system for Victoria's forests is formally part of the RFAs there are significant differences between the two. 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 classified 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 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.

⁹ 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.

1.9 Legislative and 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 2019.¹⁰ This document provides an overview of Victoria's forest management system as at December 2019 and its various components, including legislation, policies, codes, plans and management practices and processes. Since then, key policies and programs recently developed or currently underway and of relevance to forest management or this assessment include:

Victorian Traditional Owner 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.¹¹

Renewing Victoria's public land legislation

The Victorian government is developing proposals to renew Victoria's public land legislation, including the creation of a new Public Land Act.¹²

Wildlife legislation review

An independent Expert Advisory Panel was appointed in 2020 to review the *Wildlife Act 1975*. The review is part of a wider examination of Victoria's legislative framework for protecting and managing biodiversity.¹³

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.¹⁴

Bushfire emergency – biodiversity response and recovery

The Victorian bushfires of 2019-2020 were exceptional in size and impact. Guided by analysis of the fire extent as of 20 April 2020, including impacts to IPAs, DELWP has worked alongside species experts, academics, and land managers to prioritise actions for fire-affected threatened species and habitats.

1.10 Management arrangements and administrative areas

The Strathbogrie Ranges IPA is located within the following administrative areas:

Local Government Areas	DELWP Region	DELWP District	Regional Forest Agreement region	Forest Management Area	Representative Aboriginal body	Catchment Management Authority
Benalla Rural City Mansfield Shire Strathbogrie Shire	Hume	Goulburn	North East	Benalla-Mansfield	Taungurung Land and Waters Council	Goulburn Broken

10 https://www.delwp.vic.gov.au/__data/assets/pdf_file/0027/458640/Forest-Management-System-Overview-2019-1.pdf

11 <https://www.fvtoc.com.au/cultural-landscapes>

12 See <https://engage.vic.gov.au/renewing-victorias-public-land-legislation>

13 See <https://engage.vic.gov.au/independent-review-victorias-wildlife-act-1975>

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



This section provides an overview of the region and landscape within which the Strathbogie Ranges Immediate Protection Area is situated.

2.1 Regional overview

The Strathbogie Ranges Immediate Protection Area (IPA) is located approximately 120 kilometres northeast of Melbourne, near Euroa. The Strathbogie Ranges cover an area of about 240,000 hectares north of the Great Dividing Range situated between the Goulburn River to the west, the Broken River to the east and the Hume Highway to the north. The IPA comprises approximately ten per cent of the Strathbogie Ranges, covering most of the forested area in the east.

The closest township to the west of the IPA, Strathbogie, has a population of approximately 300 people (2016 Census). Most of the Strathbogie Ranges have been cleared for land uses such as mixed farming and grazing, commercial forestry, and rural lifestyle properties. The IPA straddles the Goulburn and Broken river basins.

The Strathbogie Ranges are effectively a promontory of granite extending northwest from the main part of the Great Dividing Range. Over much of the Ranges, the granite forms a relatively flat-topped 'tableland' between about 500 and 900 metres above sea level. This elevation draws rain from prevailing weather systems coming from the west and northeast, with less run off on the gentle topography of the tableland than on more dissected ranges in this part of Victoria.

These conditions proved suitable for settlement initially by pastoralists for sheep grazing. Subsequent improvement of pastures by the introduction of subterranean clover and super-phosphate has enabled cattle grazing to occur in the Strathbogie Ranges. The Strathbogie Ranges have supported a number of land use activities including mining, beef cattle farming and timber harvesting.

2.2 Public land

The area of the IPA originally estimated from data extracted from DELWP's corporate spatial data library was approximately 23,000 hectares. Since then, VEAC has recalculated the area using more accurate public land spatial data to get an updated boundary. The recalculated area for the Strathbogie Ranges IPA is 24,220 hectares. Approximately 5000 hectares of the State forest in the IPA is currently Special Protection Zone.

Areas of public land around the Strathbogie Ranges IPA include Reef Hills State Park to the north near Benalla, the Tallangalook-Dry Creek Historic Reserve abutting the IPA to the south, Mount Samaria State Park and Tolmie-Toombullup state forests to the east across the Midland Highway, and the Mount Wombat-Garden Range Nature Reserve to the west.

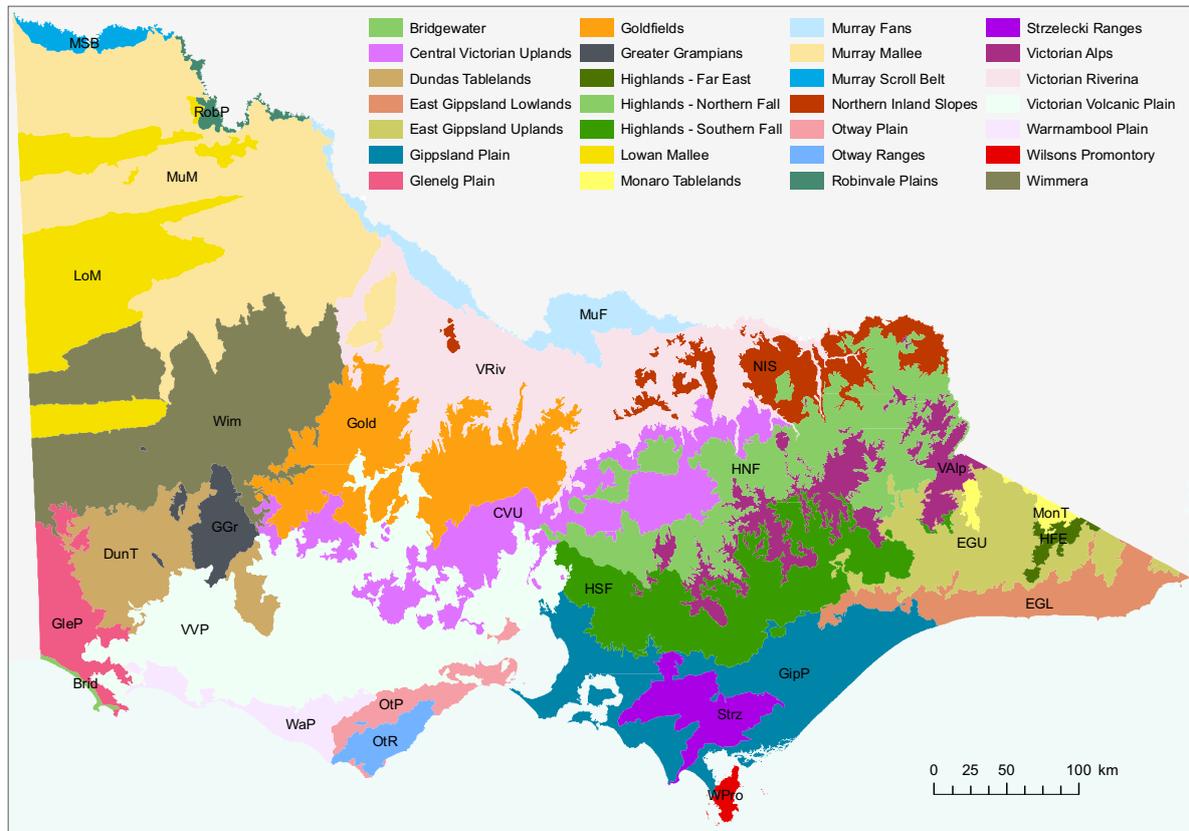
The 2018 Recognition and Settlement Agreement between the Taungurung People and the State of Victoria includes the grants of nine parks and reserves as Aboriginal title, including Mount Samaria State Park and Mount Wombat-Garden Range Nature Reserve.

2.3 Landscape context

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 2.2).

The Strathbogie Ranges IPA is mostly within the Highlands - Northern Fall bioregion, with some smaller areas (in the north and along the eastern and southern edges of the IPA) falling within the Central Victorian Uplands bioregion.

Figure 2.2 Victorian bioregions



The Highlands - Northern Fall bioregion is the northerly aspect of the Great Dividing Range comprising dissected uplands with moderate to steep slopes, high plateaus and alluvial flats along the main valleys. The geology is of Palaeozoic deposits giving rise to predominantly sedimentary and granitic rocks. The brown and red porous earths occur in the upper reaches and yellow and red texture contrast soils graduate down the valleys. The vegetation is a patchwork of Herb-rich Foothill Forest and Shrubby Dry Forest. Major vegetation types of the lower slopes are Montane Dry Woodland. Heathy Dry Forest EVCs occur on the upper slopes and plateau. Grassy Dry Forest and Valley Grassy Forest occur along the river valleys. Average annual rainfall across the bioregion is 700-1400 mm and daily mean temperature across the bioregion is 9-12°C.

The Central Victorian Uplands is characterised by gently undulating terrain with occasional steeper slopes, ridges and peaks. Geology is more varied than most bioregions, comprising Palaeozoic

sediments transformed and intruded by igneous incursions and raised by earth movements. Subsequently, there has been relatively little geological activity other than erosion subduing the topography, exposing the granitic intrusions and associated metamorphics, and forming features such as outwash fans. The upper slopes and ridges support dry forest and woodland ecosystems. The low lying fertile plains are dominated by open eucalypt (e.g. red box, stringybark, broad-leafed peppermint) and *Allocasuarina* forest and woodlands with a diverse ground layer of grasses, herbs and shrubs. A number of regionally important rivers traverse the region, including the Goulburn, Broken, Campaspe and Loddon Rivers. Average annual rainfall across the bioregion is 600-1000 mm and daily mean temperature across the bioregion is 15-21°C.

VEAC's Remnant Native Vegetation Investigation examined remnant native vegetation outside of Victoria's largely-intact landscapes.¹⁵ VEAC's analyses showed that both the Central Victorian Uplands and Highlands - Northern Fall bioregions are moderately cleared. Only 3 per cent of the Central Victorian Uplands bioregion is largely intact, and in the fragmented landscape, only a relatively small proportion is within the protected area system. Heavily cleared areas in the bioregion tend to be around older towns on flatter terrain, such as Alexandra and Mansfield.

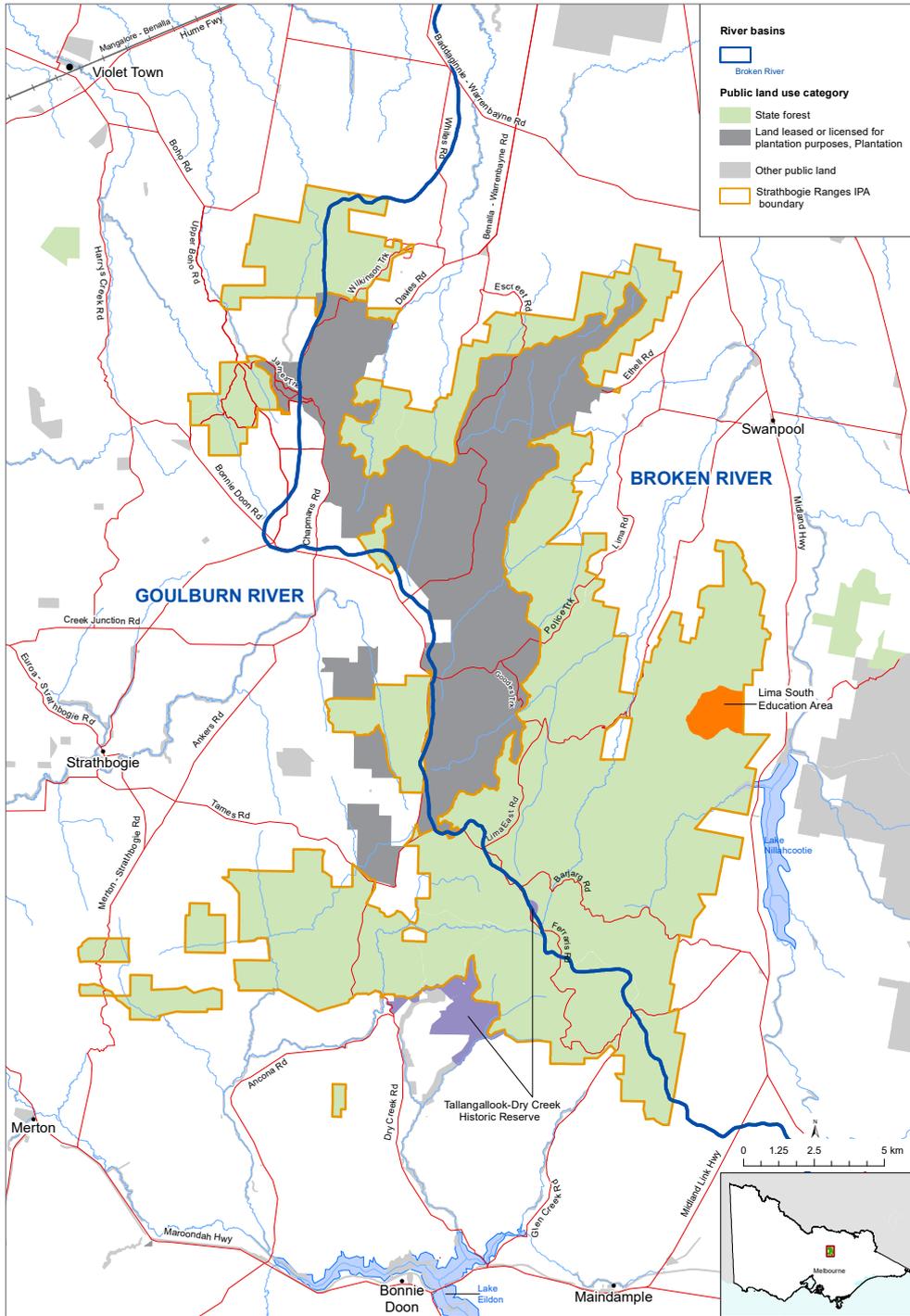
The Highlands - Northern Fall bioregion was found to be one of the moderately cleared bioregions buffered extensively by largely-intact landscapes, such as the boundary adjacent to the Victorian Alps. In the fragmented landscape, most of the remaining native vegetation is on public land with a moderate proportion in conservation reserves. Clearing of vegetation is confined to the bioregion boundaries adjacent to the Central Victorian Uplands and the Northern Inlands Slopes as well as around Omeo. Cleared areas are associated with the flatter slopes and river valleys that are more suitable for agriculture.

The northwestern and southwestern parts of the Strathbogie Ranges IPA form part of the catchment for the Goulburn River while the remainder of the IPA forms part of the Broken River catchment (see figure 2.3). The Broken River is a tributary of the Goulburn River, joining the Goulburn River near Shepparton. Covering 7.1 per cent of the state, the Goulburn River catchment basin is Victoria's largest river basin.¹⁶

15 VEAC (2010) *Remnant Native Vegetation Investigation Discussion Paper*

16 Victorian Environmental Water Holder <https://www.vewh.vic.gov.au/rivers-and-wetlands/northern-region/goulburn-river>

Figure 2.3 River basins in the Strathbogie Ranges IPA





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.

The chapter begins with a discussion of Traditional Owner values, rights and interests in the IPA as provided to VEAC by Taungurung Land and Waters Council (TLaWC).

Recently, Victorian Traditional Owners developed a Cultural Landscapes Strategy for forests and parks with the vision that 'we have the enabling conditions to heal country and culture through the application of our knowledge and practice in the contemporary expression of living bio-cultural landscapes'.¹⁷ The strategy notes that while Traditional Owners take a holistic approach to management of Country, the government takes a values-driven approach to the management of public land.

3.1 Values, rights and interests of Traditional Owners

This section reproduces the TLaWC report to VEAC regarding the Taungurung assessment of the biocultural values of the Immediate Protection Area in the Strathbogie Ranges and provided to VEAC in March 2022. Terms used in this report are explained in appendix 1 along with references.

¹⁷ <https://www.delwp.vic.gov.au/futureforests/what-were-doing/victorian-cultural-landscapes-strategy>

Taungurung report to VEAC regarding the assessment of the biocultural values of an Immediate Protection Area in the

This section provides the results of a rapid biocultural assessment of the Strathbogie Cultural Landscape¹⁸ undertaken by Taungurung Land and Waters Council (TLaWC). Taungurung appreciate the opportunity to walk on country with Taungurung knowledge holders, undertake a review of historic documents, consider a range of values associated within the cultural landscape and provide this submission. This report is a synthesis of different components involved in the rapid assessment of biocultural values. It is structured to address the terms of reference for the assessment of values in the Immediate Protection Area (IPA) in the Strathbogie Ranges. The report acknowledges Taungurung Elders past and present who have fought to maintain their rights and responsibility to care for our Country, Culture and People.



Taungurung knowledge holders walking on Country in the Strathbogie Ranges IPA as part of a rapid biocultural assessment

¹⁸ A language name for the cultural landscape is currently being considered by the Taungurung.

Summary of key points

Strathbogie Ranges IPA is an area of cultural importance to Taungurung people.

Taungurung favour continued management of the Strathbogie Ranges IPA under the three existing Crown Land Acts until the new Public Land Act is passed and the rights it provides Traditional Owners understood.

Interim planning, management and governance arrangements that support Taungurung rights and interests and that are enabled in the Victorian Traditional Owner Cultural Landscapes Strategy are proposed.

Creation of a Forest Park under the *Forest Act 1958* and appointment of TLaWC as a Committee of Management will improve Taungurung rights to govern areas within the Strathbogie Cultural Landscape while navigating planned legislative change.

Persistent threats across the Strathbogie Cultural Landscape continue to challenge land managers. Working together provides different land managers the best opportunity to address threats and maintain and improve values.

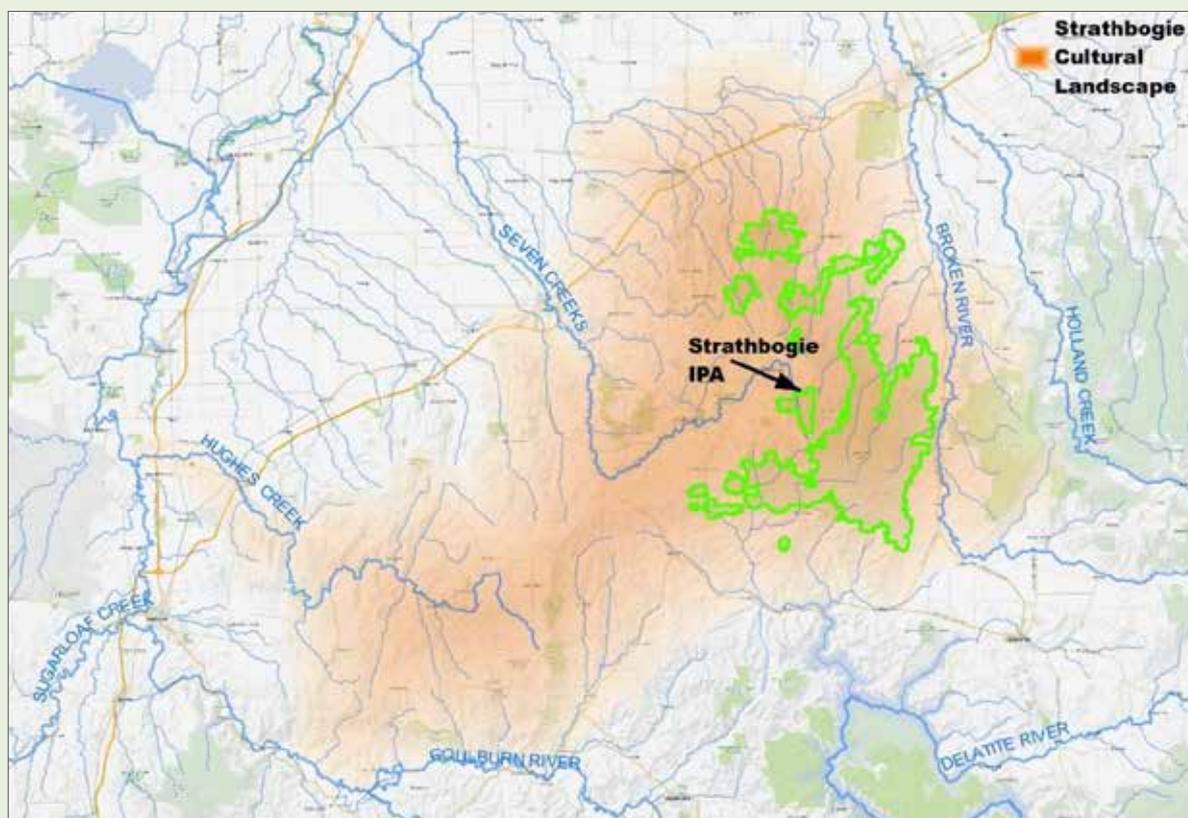
Any recommendations made by VEAC should recognise and improve Taungurung rights.

Context

Strathbogie Cultural Landscape

The Strathbogie Immediate Protection Area is located in the Strathbogie Cultural Landscape. In different contexts and for different purposes, the Strathbogie Ranges have been described in different ways. The rapid biocultural assessment undertaken by TLaWC considered the Strathbogie Cultural Landscape as the general area south of the Hume Freeway between the Seymour and Benalla, Mount Samaria to the East and various streams, catchments and spurs to the south.

Figure 3.1 Strathbogie Cultural Landscape



The Strathbogie Cultural Landscape is central to Taungurung Country and an area of high cultural significance before and during the colonial period. The Strathbogie Cultural Landscape includes the traditional lands of the Yowung-illam-baluk clan - one of the fifteen clans that make up Taungurung. The name 'Yowung-illam-baluk' means 'stone camp people': yowung meaning stone; (w)illam camp; and -baluk people.

Taungurung cultural heritage is a core part of identity and connection to Country. It can be found in tangible and intangible evidence such as the mountains, waterways, art sites and trees that form Country, and their links to creation and other stories about Taungurung way of life, before and after dispossession. Tangible evidence can be found in the Garden Range art complex known to encompass four rock shelters. Two shelters containing art are within the Mount Wombat Garden Range Flora and Fauna Reserve and two are on property owned by TLaWC. Archaeological excavations undertaken at the Garden Range rock art sites indicate people have used the sites since at least the end of the last ice age 11,000 year ago.

The Strathbogie Cultural Landscape has experienced significant change since Europeans established permanent settlements on the Australian continent. Many of the processes creating these changes continue to threaten the Strathbogie Cultural Landscape and its lifeforms today.

Legislation and agreements

Taungurung Land and Waters Council (TLaWC) was registered as the Registered Aboriginal Party (RAP) to represent the interest of the Taungurung people on 16 July 2009. TLaWC protects the cultural heritage of Taungurung people by performing the functions of a RAP under the *Victorian Aboriginal Heritage Act 2006*.

On 26 October 2018 Taungurung executed a suite of settlement agreements under the *Traditional Owner Settlement Act 2010* and related legislation. The settlement includes a Recognition and Settlement Agreement (RSA), which recognises the Taungurung peoples' Traditional Owner rights and provides measures to promote that recognition.

The Strathbogie IPA is within the Taungurung RAP and RSA area.

The Recognition and Settlement Agreement acknowledges:

*Waydjak bunbunarik liwik-nganjin yaraga-ngala dhumbali daada gurnap biik-nganjin
yulendj-nganjin*

We are the descendants of our old people and we have an ongoing responsibility to look after our inheritance, which is our country and our culture.

Nganga-ngala biik-nganjin yaraga-ngala burndap gerr ngarrnga bak wilanja-nganjin

We look after Country because we have an intimate relationship with country like thousands of generations of Taungurung before us.

*Ngala barra gerr-nganjin gilbruk biik-nganjin yarang bak daada gurnap dhumbali biik-dhan
bak wilanja-dhana*

We will continue our relationship with respect for our country and teach the new generations that they have the same inheritance and responsibility to their country as every generation before them has had.

The Recognition and Settlement Agreement progresses Taungurung rights for Governance of Country by granting Aboriginal Title over areas of Parks and Reserves and providing funding for employment and delivering works on Aboriginal Title Land. The Agreement granted Aboriginal Title of nine parks within the Agreement area, to be jointly managed with the State pursuant to the *National Parks Act 1975*. One such Aboriginal Title Park is the Mount Wombat Garden Range, which forms an important part of the cultural landscape containing the Strathbogie Ranges.

The Victorian Government is developing proposals to reform Victoria's public land legislation, including the creation of a new Public Land Act. The replacement of three existing Crown Land Acts (the *Crown Land (Reserves) Act 1978*, *Forests Act 1958* and *Land Act 1958*) with a new Public Land Act will be the biggest change to public land legislative arrangements in multiple generations.

Through the process of reforming Victoria's public land legislation, the Victorian Government is considering ways for Traditional Owners to be appointed public land managers. Consistent with the principle of self-determination, it is not proposed to mandate any single way for Traditional Owners to be public land managers, but provide a range of opportunities. The reformed public land legislation will not incorporate Parks and Reserves managed under the *National Parks Act 1975*. The *National Parks Act 1975* will continue to apply to Parks and Reserves granted Aboriginal Title under the Recognition and Settlement Agreement.

Taungurung favour continued management of the Strathbogie Ranges IPA under the three existing Crown Land Acts until the new Public Land Act is passed and the rights it provides Traditional Owners understood. With the reformed public land legislation predicted to pass into law within 5 years, Taungurung do not want to risk foregoing potential future rights by changing tenure of the Strathbogie Ranges IPA to a land category managed under the *National Parks Act 1975* through this current assessment.

Policies and strategies

The Victorian Traditional Owner Cultural Landscapes Strategy, incorporated into State of Victoria policy in 2021, addresses Traditional Owner Cultural Landscape Management in component 5. This component recognises Cultural Landscape Management will be undertaken by Traditional Owners as land managers. The strategy suggests reformed public land legislation will facilitate this¹⁹.

Other components of the Cultural Landscapes Strategy suggest appointment of Traditional Owner Corporations as Committees of Management over public land. The arrangements for appointment of TLaWC as a Committee of Management over the Strathbogie will be discussed later in this report.

Other policies and strategies relevant to Taungurung rights and interest in the Strathbogie IPA include:

- Taungurung Country Plan 2016
- Victorian Traditional Owner Cultural Fire Strategy 2020
- Victorian Traditional Owner Game Management Strategy 2021
- Victorian Aboriginal Affairs Framework 2018-2023
- Protecting Victoria's Environment - Biodiversity 2037

Values

The Strathbogie Cultural Landscape is central to Taungurung Country and an area of high cultural significance. For thousands of years prior to European settlement Country and all within it was wisely and sustainably managed. Taungurung Ancestors were brilliant conservationists and managers of natural and cultural resources. They were able to use resources while keeping their Country and People healthy and strong. Taungurung People are staunchly committed to caring for Country.

¹⁹ New Fauna legislation in Victoria may also enable provisions in the Cultural Landscapes Strategy, including provisions for culturally valued species management and collaborative governance.

Prior to European settlement Taungurung society was based on an intimate and dynamic relationship with forest ecosystems. Timber, bark and forest plants were primary materials for creating tools, vessels, fire, shelter, medicines, instruments, weapons, craft materials and transport. The forest also provided a range of animals used for food and clothing. Fire was used to encourage fresh growth of plants for animals to graze, to promote edible plant foods, expose edible roots, create pathways, clear sites for dwellings and camps, and keep this vital infrastructure safe from wildfire. The forests also contained places of spiritual significance and areas used for traditional cultural ceremonies.

Taungurung people view Country as a connected whole, afforded the same respect that a family member is given, acknowledging the agency of Country and its many layers of ancestral meaning. Assessing the Strathbogie IPA in isolation of the surrounding landscape is not possible. Separating people, bio-cultural diversity, Aboriginal cultural heritage (tangible and intangible) and social values is impractical. This difficulty is acknowledged through the *Aboriginal Heritage Act 2006* definitions of Aboriginal cultural heritage and cultural heritage significance. Aboriginal cultural heritage means Aboriginal places, objects and ancestral remains. Cultural heritage significance includes archaeological, anthropological, contemporary, historical, scientific, social or spiritual significance and significance in accordance with Aboriginal tradition. People and all elements of Country are connected.



Only a small portion of the Strathbogie Cultural Landscape has been inspected for tangible cultural heritage. Many sites could undergo further assessment.



Only a small portion of the Strathbogie Cultural Landscape has been inspected for tangible cultural heritage. Many sites could undergo further assessment.

Only a small portion of the Strathbogie Cultural Landscape has been inspected for tangible cultural heritage. Field visits undertaken to gather information for this report identified potential cultural heritage sites like rock shelters, scar trees and artefact scatters that will require further investigation. There is the potential for identification of many more cultural heritage sites throughout the Strathbogie Cultural Landscape. Surveys are best undertaken after bushfires or planned burns when vegetation cover has been reduced and ground visibility increased. There are more areas of cultural sensitivity than those outlined in planning layers. For example, cultural sensitivity layers in the Strathbogie Cultural Landscape fail to recognise the value of high peaks with clear views and rocky outcrops. Assessment and recording of intangible cultural heritage across the Strathbogie Cultural Landscape is even less prevalent.

Table 3.1 summarises biocultural values identified in the Strathbogie Ranges through TLaWC's rapid assessment for the purposes of this report. The list has been generalised to detail only traditional practical uses. Cultural and ceremonial values have not been outlined.

The summary demonstrates Taungurung people's extensive knowledge of their environment and the practical use they made of many things. Knowledge and use of the environment were underpinned by cultural practices. Traditional obligations to understand and care for Country continue. Country is the heart of Taungurung identity. The right and responsibility to care for Country, Culture and People are critical to the identity and well-being of Taungurung People now and into the future.



Morr (*Coprosma quadrifida*) grows on sheltered sites in the Strathbogrie Cultural Landscape and provides edible fruit during late summer and autumn.

Taungurung people gain significant social and community benefit through practicing culture in caring for Country. During a field visit to gather information for this report it was highlighted being on Country is good for the soul. All Taungurung people feel it. People feel an extra sense of peace being home on Country. Country heals.

Table 3.1 Summary of biocultural values in the Strathbogrie Cultural Landscape

Value	Practical traditional use	Current social context
<p><i>Cultural sites –</i> Art sites Artefact scatters Habitation sites Ceremonial sites Conflict sites Culturally modified trees Grinding Grooves Stone/ochre quarrying Totemic species Travel routes Waterholes, rivers and waterways</p>	<p>Archaeological sites are important to the Taungurung community as they provide a link to the past activities like: Ceremonies. Knowledge transfer and teaching. Culturally important species. Manufacture of tools and personal items. Movement across Country.</p>	<p>A significant amount of cultural heritage has been damaged, destroyed, removed or lost. Core to identity and connection to Country. Physical evidence of past cultural activities. Confirms use of an area. Lack of known cultural sites does not equate to lack of cultural value.</p>
<p><i>Landforms –</i> Prominent views Rock outcrops Rock shelters Sites of geological significance</p>	<p>Tools. Shelter. Communication.</p>	<p>Sites of mining activity. Recreation. Telecommunications infrastructure.</p>
<p><i>Water ways –</i> Streams, Rivers Wetlands</p>	<p>Habitation. Water. Washing. Travel.</p>	<p>Natural water flows altered to utilise land and water. Water supply for domestic and agricultural purposes. Recreation.</p>
<p><i>Trees –</i> Eucalypts - Box, Gum, Stringybark Acacia - Silver Wattle, Black Wattle, Blackwood Other - Cherry Ballart, Mistletoe</p>	<p>Wood for tools and implements like spears, spear throwers, boomerangs, bull roarers. Bark for shelter, personal items, string. Climbed to source favoured animals like possums and gliders. Exudates for food. Sap for food, medicine and manufacturing. Fuel. Leaves for medicine, washing and cleaning.</p>	<p>Large, old trees provide habitat for important animal species. Source of wood for variety of uses including timber and firewood. Can be considered hazardous to public safety in some settings. Some species grown in plantation settings for timber. Eucalypts popular source of pollen and nectar for apiculture.</p>
<p><i>Shrubs –</i> Banksia Grevillia Blanket Leaf Dogwood Ti-tree, Burgan Paperbark Bottle Brush Hop Bush Kangaroo Apple Prickly Currant Christmas Bush Bootlace bush</p>	<p>Multitude of uses. Roots, leaves and seeds for food. Medicine. Bark, leaves and stems for fibre. Fire production, fire transport and fuel. Stems and boughs for shelter.</p>	<p>Intrinsic value. Some species commercialised as garden plants. Apiculture. Revival of cultural practice.</p>

<p><i>Ground covers –</i> Native mint Ground ferns Tree fern Scrub Nettle Sedges, Reeds, Rushes Mumong Orchids and Lillies Creepers - Clematis, Hardenbergia Old man weed Grasses Fungi</p>	<p>Multitude of uses. Roots, leaves and seeds for food. Medicine. Leaves, fronds and stems for fibre. Fire production, fire transport and fuel.</p>	<p>Intrinsic value. Some species commercialised as garden plants. Revival of cultural practice.</p>
<p><i>Animals –</i> Mammals - Possums, Gliders, Koala, Kangaroo, Wallaby, Echidna, Bandicoots, Wombat, Dingo, Rakali, Bats Reptiles - Turtles, Lizards, Goanna, Snakes Birds and ducks Fish Frogs Crustaceans - crayfish, yabbies Insects - moths, grubs, lerps, ants Introduced species</p>	<p>Food. Tools. Clothing.</p>	<p>Intrinsic value. Commercial agriculture has favoured some species like Kangaroo. Kangaroos numbers are controlled for agricultural purposes. Browsing effects regeneration of forest and revegetation areas. Fishing and hunting are popular activities. Pest animals. Foxes and cats predate native species. Deer, Rabbits, Pigs browse and disturb vegetation. Dingo considered agricultural pest. Revival of cultural practice.</p>

Notes: This list is a summary that emphasises tangible values associated with seasonal use and should not be considered exhaustive.



The Strathbogrie Ranges provide widespread habitat for Taungurung moiety Bundjil (*Aquila audax*).

Taungurung recognise the values different people identify within the Strathbogie IPA. Taungurung support existing legal activities undertaken in accordance with principles of caring for Country. Taungurung support continued access for a range of activities. Having people visiting areas helps rebuild their connection with the environment. Better connections between people and the environment helps identification of appropriate management actions.

Threats

The Strathbogie Cultural Landscape have experienced significant change since Europeans established permanent settlements on the Australian continent. Even before Taungurung people were removed from their land by settlers, the spread of disease, passage of early explorers, changes in patterns of trade, the arrival of new animals and displacement of people from surrounding areas disrupted traditional practices, amplifying the effects once direct contact occurred between Taungurung people and European settlers.

Taungurung People, like other Aboriginal people throughout Australia, were severely impacted by dispossession and colonisation. The removal of Taungurung people from their traditional lands in the Strathbogie Cultural Landscape from the late 1830s created a significant disruption to the environment and Taungurung way of life. As policies of removal were introduced, such as the *Victorian Aboriginal Protection Act in 1869*, Taungurung People were prevented access to Country, cultural sites and practices, medicines, food, language and eventually their own family members. Since this time a range of activities have eliminated values and created persistent threats to remaining values:

- Clearing native ecosystems for agriculture.
- Conversion of native ecosystems to introduced plantations for timber production.
- Introduction of foreign plants and animals.
- Establishment of pest plants and animals.
- Increased population pressure.
- Capture of water for agricultural use.
- Erection of fences.
- Construction of roads.
- Inappropriate fire regimes.
- Operation of extractive industries, like mining and timber harvesting.

These processes have resulted in direct impacts on values and indirect threats that continue in the Strathbogie Immediate Protection Area. Direct impacts have an immediate effect on a value. Indirect impacts create flow on effects that occur at a later time or in a different place to where the action occurred. Activities creating direct threats can be stopped, but values continue to be diminished by indirect threats. The Strathbogie IPA is a series of fragmented parcels of native vegetation. The dissected nature of the parcels in a modified landscape makes them vulnerable to ongoing indirect threats, even after direct threats have been addressed through legislation, policy and changes to land categories.

Land use change has altered the distribution of plants and animals. In some areas values have been eliminated and other values have increased in abundance. An example of this is the conversion of native vegetation and increase in Kangaroo numbers. Land clearing has removed traditional values and replaced them with introduced agricultural crops. Cleared areas, introduced pasture, creation of water points and reduced hunting pressure have helped increased kangaroo numbers. Kangaroos are no longer considered a fundamental resource and now thought of as an agricultural pest. Traditional perspectives of animals like kangaroo will help members of the public realise their importance.



Conversion of native ecosystems to pasture and plantations of introduced species created significant change to forest structure and function and diminish associated cultural values.

Threats are most apparent where remaining native vegetation borders farmland or plantation and in areas of intensive land use, like mining sites along Tallangalook Creek. Actions to address threats in these areas can be planned and delivered in collaboration with neighbouring land owners. It is important stakeholders through the Strathbogrie Cultural Landscape work together to appreciate values and implement actions to manage threats.

Typical land use categories

The negative impacts of these threats cannot be resolved through management arrangements within the Strathbogrie IPA alone. A community-based approach to managing values in the landscape will provide the best opportunity to maintain existing values, address existing and potential threats and improve areas where values have been removed and eroded. Land use categories that encourage the community to work together help achieve the core Taungurung principle of caring for Country and should be implemented.

The State's plan to reform Victoria's public land legislation, including the creation of a new Public Land Act, will improve Traditional Owner rights to govern public land. The time available before the Public Land Act is passed creates the opportunity to plan and implement interim governance arrangements before establishing perpetual, enduring arrangements.

There are a range of land tenure categories available under existing public land legislation, including:

- Maintenance of existing arrangements.
- Creation of a new National Park or Reserve under the National Parks Act 1975 and implementation of Joint Management arrangements.
- Creation of a Reserve under one of the existing three Crown Land Acts and appointment of governance responsibilities to Taungurung.

Until the new Public Land Act is passed and the rights it provides Traditional Owners understood, Taungurung favour management arrangements of the Strathbogie Ranges IPA that are possible under the three existing Crown Land Acts. Section 50(1) of the *Forest Act 1958* allows the Strathbogie IPA to be set aside and declared a Forest Park. Section 50(3) of the *Forest Act 1958* allows the minister to appoint Taungurung Land and Waters Council as a Committee of Management²⁰ over the land set aside.

These arrangements are favoured by Taungurung in the interim for the following reasons:

- Taungurung are provided rights to govern an area of public land with significant cultural values .
- The Committee of Management would collaborate with other agencies and stakeholders to care for Country.
- The Strathbogie Ranges Immediate Protection Area will have a reserve category applied.
- Retains the ability to use rights afforded under the new Public Land Act.
- An alternative governance model to Joint Management can be tested.

Creation of a Forest Park and appointment of TLWC as a Committee of Management is part of a process of improving Taungurung rights to govern areas within the Strathbogie Cultural Landscape while navigating planned legislative change. Table 3.2 below outlines stages to progress from current arrangements for the Strathbogie Ranges IPA to enduring future arrangements.

Table 3.2 Stages from current to future arrangements

Theme	Phase (timeframe)		
	Now	Interim	Enduring arrangements
Planning	Strathbogie State Forest IPA. Forest Management Plan for the North East.	Forest Park. Cultural Management Plan.	Cultural Reserve. Cultural Reserve Management Plan. Cultural Landscape Overlay. Cultural Landscape Management Plan.
Management	Protections implemented through IPA. Roading, recreation, pest plant and animal control, provision of firewood. Fire management activities.	Continue forest and fire management. Support recreation and tourism opportunities. Consider application of IUCN Category 5 and 6 Protected Areas, for the reserve and landscape, respectively. Initiate Indigenous management practices to heal Country.	Continue to support forest and fire management. Support recreation and tourism opportunities. Consider cultural covenants with support of private landowners. Embed Indigenous management practices to care for Country.
Governance	DELWP	Committee of Management of public land. Development and establishment of Collaborative Governance.	Sole management of public land. Collaborative Governance of Cultural Landscape.
Resourcing	DELWP	Taungurung apply for Indigenous Protected Area funding. DELWP transfer current management resources to Taungurung to support Committee of Management.	Indigenous Protected Area over public land. Taungurung lead employment, planning and management. DELWP maintain resourcing to Taungurung to support collaborative governance and management arrangements over Strathbogie Cultural Reserve. Investigate World Heritage Area status.

²⁰ The CoM needs to be a suitable basis for development as sole management; that is, planning through codesign, governance by the Indigenous Nation and that enables the application of Indigenous knowledge and practice in management. A TLWC CoM may be supported by one or more advisory groups to incorporate key community interests into decision making. This also aligns well with the principles and practice of collaborative governance.

Taungurung principles of caring for Country can be embedded through sole management of public land in the Strathbogie Ranges IPA. TLaWC support existing legal uses of the Strathbogie Ranges IPA and recognise the need to build transparent relationships to be effective land managers. An interim arrangement with TLaWC appointed as a Committee of Management over a Forest Park will allow Taungurung to determine practices applied to address threats and maintain and improve values while continuing opportunities for existing legal uses of the Strathbogie Ranges IPA.

Economic implications

The proposal would result in a transfer of governance and associated funding. The proposed land use categorisation will support existing legal uses within the Strathbogie IPA. Current activities that are consistent with healing and caring for Country like apiculture and firewood collection will continue to provide commercial and community benefit.

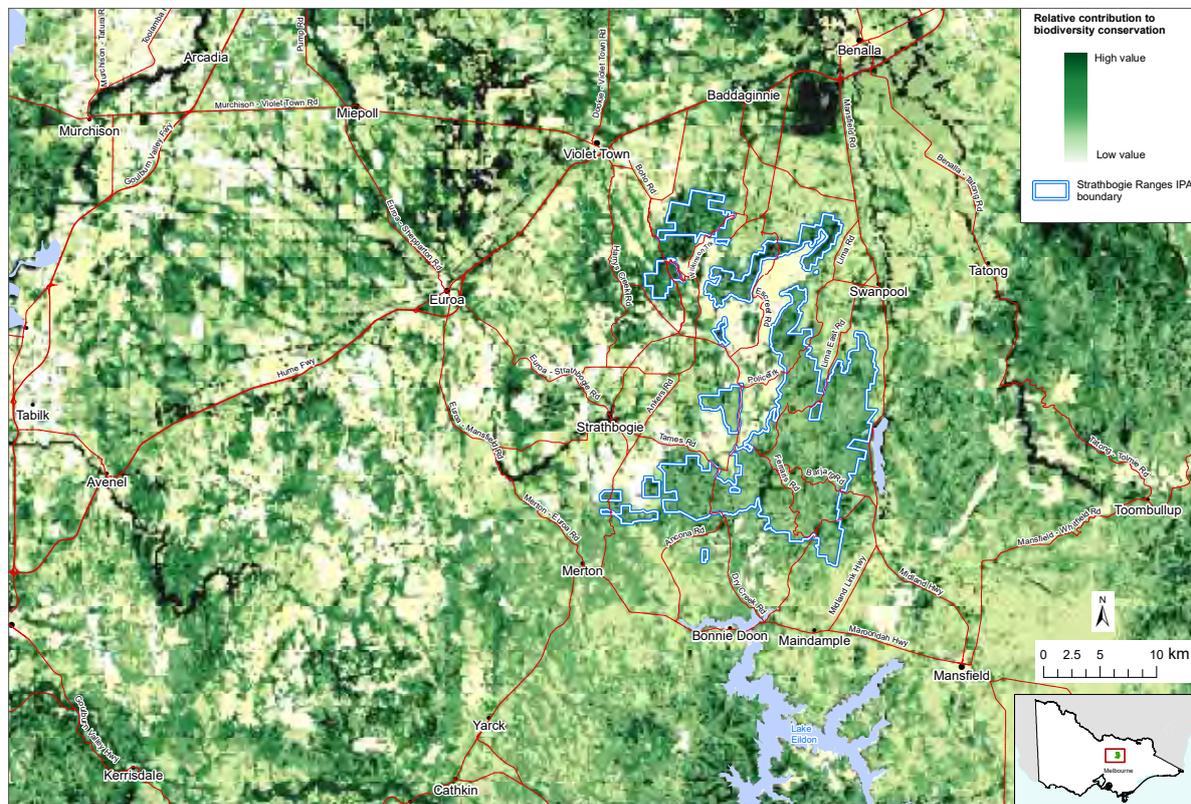
3.2 Biodiversity and ecological values

For biodiversity and ecological values of the Strathbogies Ranges IPA, the standard information sources noted in section 1.5 and detailed in appendix 2 were supplemented with information obtained from the detailed report provided by the local community group Save Our Strathbogies Forest Campaign²¹ and through discussions with members of SOSFC, local naturalists, scientists and DELWP staff based in the region and in Melbourne.

3.2.1 Threatened species

Strategic Biodiversity Values (SBV) is one of DELWP’s NaturePrint decision-support products. It combines information on areas important for threatened flora and fauna, and vegetation types and condition to provide a view of relative biodiversity importance of all parts of the Victorian landscape.²² The map of Strategic Biodiversity Values of the Strathbogies Ranges and the surrounding region (figure 3.2) shows the IPA as an area of typical relative contribution to biodiversity conservation compared to similar forested public land blocks to the south and east. Compared to the rest of the Strathbogies Ranges (southwest to near Trawool), it comprises the largest remaining consolidated area of highest biodiversity value.

Figure 3.2 Strategic Biodiversity Values of the Strathbogies Ranges IPA and surrounding land

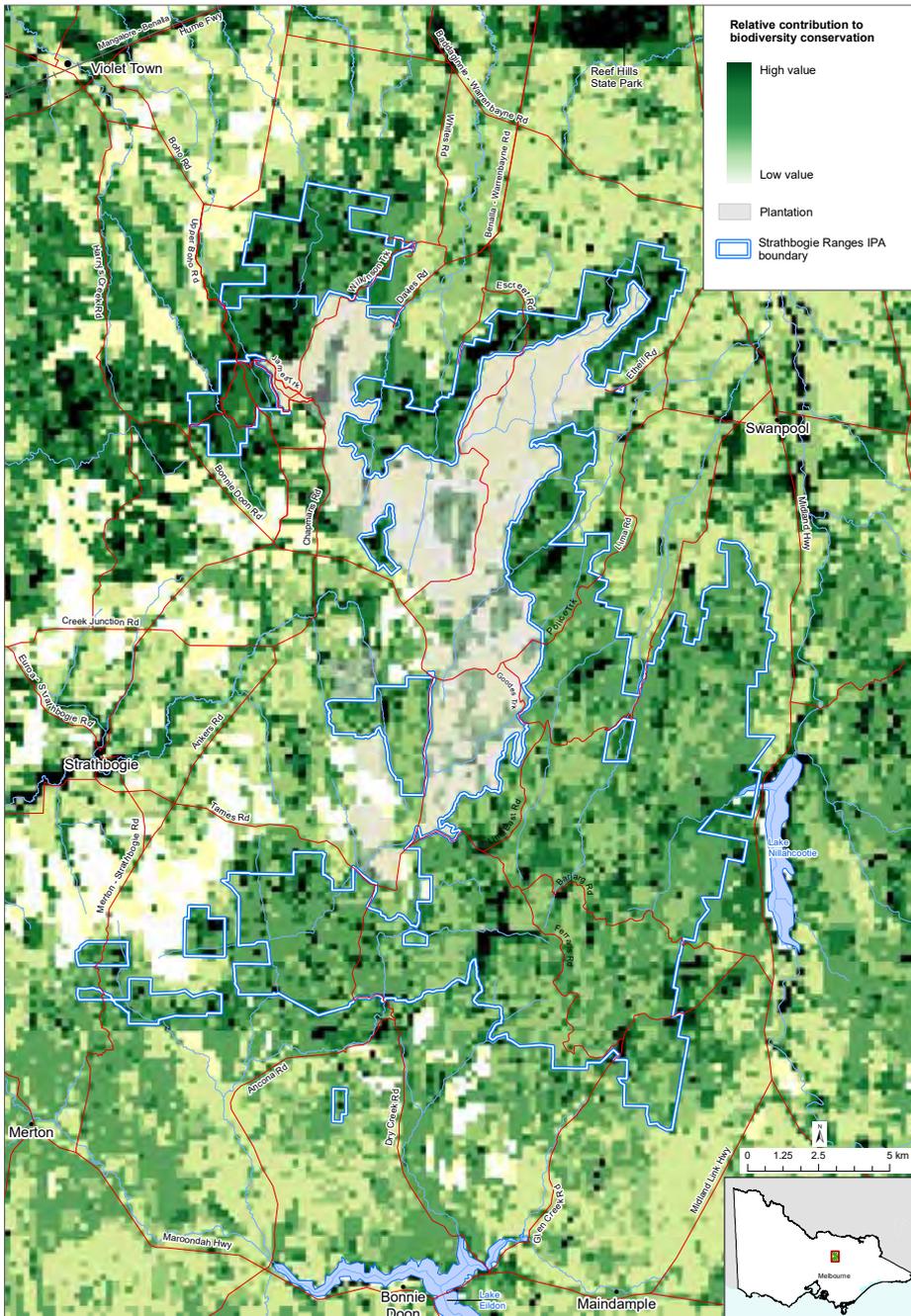


21 Save our Strathbogies Forest Campaign (2018) *Protecting the Strathbogies Forest: A community, biodiversity and policy imperative*. https://strathbogiesustainableforests.files.wordpress.com/2018/09/protectingthestrathbogiesforest_web_2.pdf
 22 https://www.environment.vic.gov.au/_data/assets/pdf_file/0031/82993/3-NaturePrint-Strategic-Biodiversity-Values.pdf

The biodiversity value of the IPA contrasts with (and is probably impacted by) the abutting pine plantations of conspicuous very low relative contribution. It also contrasts with the higher contribution areas on the flatter land to the north and west (e.g. north of Euroa) where more intensive agricultural use has led to a higher proportion of threatened species in the local biota. As a consequence there is a higher relative contribution to biodiversity conservation in parts of those areas where more native vegetation remains.

This pattern is also apparent within the IPA, with the drier more open forests of the northern parts of the IPA generally making the highest relative contribution (figure 3.3). It is also worth noting the high contribution of Seven Creeks – apparent as a dark line running northeast to southwest south of Mount Wombat and through Strathbogrie township. The headwaters of this ecologically important waterway are very largely in the IPA.

Figure 3.3 Strategic Biodiversity Values of the Strathbogrie Ranges IPA



The threatened species on which the Strategic Biodiversity Values analysis is largely based are listed in table 3.3. Eighteen threatened species have been recorded in the IPA and a further 11 threatened species have been recorded within two kilometres of the IPA (and may occur in the IPA).

Table 3.3 Threatened species recorded in and within two kilometres of the IPA

Species names	Conservation status in Victoria	No. of records	
		in IPA	within 2 km
Southern greater glider <i>Petauroides volans</i>	vulnerable	~300	8
Eastern horseshoe bat <i>Rhinolophus megaphyllus</i>	endangered	20	
Powerful owl <i>Ninox strenua</i>	vulnerable	26	6
Grey rice-flower <i>Pimelea treyvaudii</i>	endangered	12	2
Brush-tailed phascogale <i>Phascogale tapoatafa</i>	vulnerable	8	11
Tall leafy greenhood <i>Pterostylis cucullata</i> subsp. <i>sylvicola</i>	endangered	7	
Murray spiny crayfish <i>Euastacus armatus</i>	threatened	3	2
Little eagle <i>Hieraetus morphnoides</i>	vulnerable	3	
Hairy hop-bush <i>Dodonaea boroniifolia</i>	endangered	3	1
Square-tailed kite <i>Lophoictinia isura</i>	vulnerable	3	
Glandular early nancy <i>Wurmbea biglandulosa</i> subsp. <i>biglandulosa</i>	endangered	2	6
Euroa guinea-flower <i>Hibbertia humifusa</i> subsp. <i>erigens</i>	critically endangered	1	4
Wine-lipped spider-orchid <i>Caladenia oenochila</i>	critically endangered	1	
Cupped bush-pea <i>Pultenaea vrolandii</i>	endangered	1	1
Austral moonwort <i>Botrychium australe</i>	critically endangered	1	
Highland bush-pea <i>Pultenaea williamsonii</i>	endangered	1	
Tiny daisy <i>Brachyscome ptychocarpa</i>	endangered	1	
Large-leaf cinnamon-wattle <i>Acacia leprosa</i> var. <i>uninervis</i>	endangered	1	
Macquarie perch <i>Macquaria australasica</i>	endangered		40
Lima stringybark <i>Eucalyptus alligatrix</i> subsp. <i>limaensis</i>	critically endangered		30
Southern pygmy perch <i>Nannoperca australis</i> (Murray-Darling)	vulnerable		3
Late-flower flax-lily <i>Dianella tarda</i>	critically endangered		1
Mountain Swainson-pea <i>Swainsona recta</i>	critically endangered		1
Cottony cassinia <i>Cassinia ozothamnoides</i>	endangered		1
Bear's-ear <i>Cymbonotus lawsonianus</i>	endangered		1
Fir clubmoss <i>Huperzia australiana</i>	endangered		1
Eastern bitter-cress <i>Cardamine microthrix</i>	endangered		1
Broom scale-rush <i>Lepyrodia anarthria</i>	endangered		1
Bent-leaf wattle <i>Acacia flexifolia</i>	endangered		1

Details of the occurrence of these species in and near the IPA and the importance of the IPA for their conservation are provided in appendix 3. In summary, the IPA is likely to be of high or very high importance for 11 of these species. Some species of particular note include:

- Southern greater glider. The IPA supports some of the highest recorded densities of greater glider in Victoria, where the species appears not to have declined as it has over much of its range in the last 20 years.
- Eastern horseshoe bat. The IPA is an important site for this species in Victoria, being one of around a dozen places between Wallan and Mallacoota with clusters of records.
- Brush-tailed phascogale. The carnivorous marsupial has disappeared from large areas of its former range in Victoria and, where it still occurs, is at low densities. In the Strathbogie Ranges, phascogales mostly occur near the edges of the IPA and in adjacent roadsides, especially in the northern parts of the IPA. It may be that the IPA is providing a source population for a wider area.
- Grey rice-flower. The IPA supports substantial population at one of 15 locations in Victoria, along the inland foothills of the Dividing Range between the IPA and Corryong.
- Tall leafy greenhood. The IPA supports a substantial population at one of only seven recorded sites in Victoria.
- Euroa guinea-flower. Although most of the 14 known populations are on roadsides around Euroa and Longwood, the largest known population is in the IPA near Warrenbayne.

3.2.2 Ecosystems

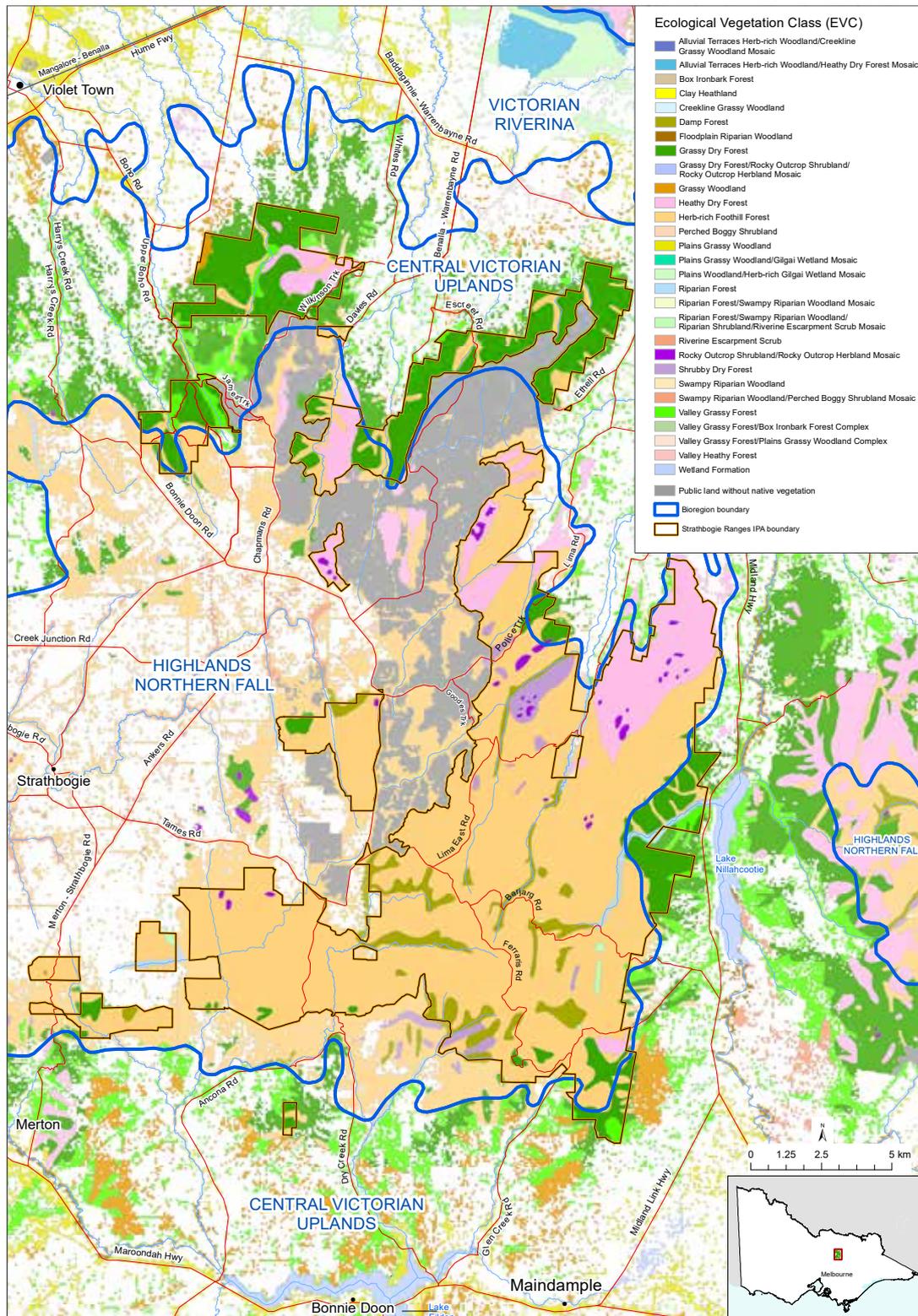
A key component of conservation planning for public land is the need to provide for a protected area system – comprising national and state parks, conservation parks, nature reserves and bushland reserves – which addresses the national and state targets for comprehensiveness, adequacy and representativeness (see section 1.8). 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.²³

Figure 3.4 shows the current extent of Ecological Vegetation Classes (EVCs) in the Strathbogie Ranges IPA. Table 3.4 presents the extent in hectares of each EVC as well as information relating to the conservation status and protected area shortfall of each EVC.

As shown in figure 3.4, nearly 80 per cent of the IPA is within the Highlands - Northern Fall (HNF) bioregion. The remainder is in the Central Victorian Uplands bioregion – in patches towards the northern and eastern edges of the IPA. The protected areas are Toorour and Glen Creek reference areas (416 and 461 hectares).

²³ For further information, see <https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks>

Figure 3.4 Bioregions and current extent of Ecological Vegetation Classes in the Strathbogie Ranges IPA



As part of its Statewide Assessment of Public Land (2017) VEAC assessed Victoria’s terrestrial protected area system against the nationally agreed criteria, and this approach has been applied to the IPA to identify those EVCs which currently do not meet the targets and the extent of their shortfalls. The shortfall 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 relevant study area is the same as that for the same bioregional EVC across the entire extent of the bioregion in Victoria. The rationale is that ecosystem (EVC) representation should be generally spread across the distribution of that ecosystem in each bioregion. Shortfalls of 100 per cent mean that all public land areas where they occur should be in protected areas if this can be reconciled with other public land uses and if there are no issues relating to the management viability of small areas.

The following analysis is based on the numerical JANIS targets combined with the threat status and remaining extent of EVCs.

The largest protected area shortfalls are in the Central Victorian Uplands bioregion – mostly in the northern part of the IPA but also in patches on the eastern edge near Lake Nillahcootie and in the southeast corner. The pertinent EVCs are:

- Grassy Dry Forest is the second most widespread bioregional EVC in the IPA. About 48 per cent of the current extent of the EVC (1724 hectares) would be needed as protected area additions to meeting nationally agreed targets
- Herb-rich Foothill Forest is the dominant EVC in the Highlands - Northern Fall part of the IPA but its occurrence in the generally drier Central Victorian Uplands is mostly restricted to valley floors and sheltered lower slopes
- While Valley Grassy Forest occupies only 268 hectares in the Central Victorian Uplands, all of this area would be included in a CAR protected area system; it occurs in spots within the patches of this bioregion on the northern and eastern flanks of the IPA.

Within the Highlands - Northern Fall bioregion there are two EVCs with relatively substantial shortfall areas:

- Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic occurs in small patches on many hilltops and, although its total extent is modest (138.5 hectares), because it is rare in the bioregion all of this extent is part of the protected area shortfall
- Conversely, Herb-rich Foothill Forest is by far the most widespread EVC in the IPA to the extent that even though the applicable shortfall per cent is very low (1.4 per cent), the shortfall area is nearly 200 hectares.

Table 3.4 Ecological Vegetation Classes (EVCs) in the Strathbogrie Ranges IPA

EVC name and bioregion*	Conservation status	Current extent (ha)		Shortfall %	Shortfall area (ha)
		Protected area	Other public land		
Grassy Dry Forest CVU	depleted	72.7	3,588.2	48.0	1,723.8
Herb-rich Foothill Forest CVU	depleted	25.5	679.8	57.1	388.5
Valley Grassy Forest CVU	vulnerable	16.5	268.2	100.0	268.2
Herb-rich Foothill Forest HNF	least concern	427.8	14,189.3	1.4	194.4
Rocky Outcrop Shrubland/Rocky Outcrop Hermland Mosaic HNF	rare	14.1	138.5	100.0	138.5
Grassy Dry Forest HNF	least concern	105.9	481.7	8.5	41.1
Grassy Woodland CVU	endangered	0.0	35.7	100.0	35.7
Riparian Forest CVU	vulnerable	0.0	47.5	32.8	15.6
Riparian Forest HNF	least concern	0.0	102.3	8.2	8.4
Swampy Riparian Woodland HNF	vulnerable	0.0	34.7	21.2	7.4
Valley Grassy Forest HNF	vulnerable	0.3	7.2	75.4	5.4
Riparian Forest/Swampy Riparian Woodland/Riparian Shrubland/Riverine Escarpment Scrub Mosaic HNF	depleted	0.0	46.4	8.7	4.1
Swampy Riparian Woodland CVU	endangered	0.0	0.1	100.0	0.1
Heathy Dry Forest HNF	least concern	3.9	2,147.2	0.0	0.0
Damp Forest HNF	least concern	9.3	1,031.5	0.0	0.0
Heathy Dry Forest CVU	least concern	0.0	279.1	0.0	0.0
Shrubby Dry Forest HNF	least concern	198.5	178.0	0.0	0.0
Rocky Outcrop Shrubland/Rocky Outcrop Hermland Mosaic CVU	least concern	0.0	3.9	0.0	0.0

* CVU Central Victorian Uplands, HNF Highlands - Northern Fall

The area required to meet protected area representation criteria (i.e. remove the shortfall) is about 12 per cent of the total IPA extent; the comparable figure for those parts of the IPA in the Central Victorian Uplands bioregion is 48 per cent. However, even before considering other factors such as threatened species, there are at least two reasons to expect CAR protected areas for the IPA to be larger than 12 per cent IPA-wide figure:

- Especially in the Central Victorian Uplands bioregion, 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 strategic assessment, it is not possible to properly evaluate the condition or quality of the patches of under-represented EVCs in the IPA compared to patches of these EVCs elsewhere in the bioregion that might also be potential protected area additions. In the first instance, though, the forest in the IPA is in generally good condition, relatively unburnt and in relatively large, consolidated patches – measures that frequently diminish the comparative suitability of candidate protected areas. In fact, as noted in the next section, some parts of the IPA appear to support unusually valuable examples of their forest type.

3.2.3 Forest condition

Site condition mapping shows high site condition vegetation in the central part of the IPA extending patchily to the northern boundary, but only intermediate site condition in the southwest part of the IPA.²⁴ From field inspections of the site and in the context of VEAC's experience across Victoria, the following observations support and add detail to this interpretation of site condition:

- A striking aspect of native vegetation condition in the IPA is the outstanding quality of the forests of the tableland – a broad area extending roughly from Mt Barranhet to Mt Strathbogrie (see figure 2.1.). Although these forests are Herb-rich Foothill Forest EVC, their condition is such that they look quite different to other examples of this EVC – and not just examples from tens of kilometres away but including those in the IPA a few kilometres to the east. These forests are outstanding in terms of their age, abundance of large hollow-bearing trees and fallen wood, understorey diversity and intactness, and minimal evidence of disturbance. Herb-rich Foothill Forest in the Highlands - Northern Fall bioregion has by far the largest current extent of any bioregional EVC in Victoria – 521,000 hectares compared to 307,000 hectares for the second-most extensive EVC. However, over the vast majority of its range this EVC occurs patchily in foothills (below 1000 metres elevation) with relatively steep topography compared to the flatter tableland section of the IPA. At around 1000 metres altitude, the tableland combines water-holding topography and rain-attracting altitude which probably at least partly explains the quality of the forest. These conditions promote forest growth and probably defend against drought and fire (see below regarding the paucity of wildfire in the IPA). On this basis, these forests are also likely to be among the most resilient to climate change in this part of Victoria.
- In many places the northern edge of the IPA shows evidence of a history of domestic stock grazing, in addition to the approximately 300 hectares currently licensed for grazing. Evidence includes old fences, and – more relevant for forest condition – partial to almost complete clearing of trees, erosion on slopes and along drainage lines, churning and siltation in moister parts of the landscape, and a variety of weeds.
- Much of the IPA has relatively low levels of weed invasion, with three notable exceptions:
 - In the southwest part of the main forest block (approximately west from the Tallangalook-Dry Creek Historic Reserve), by far the dominant ground-cover plant is sweet vernal grass (*Anthoxanthum odoratum*). Another weed, cat's ear (*Hypochaeris radicata*), is probably second in abundance. To the untrained eye, the forest looks like a natural grassy forest with yellow 'wildflowers' (cat's ear) but the weeds are thriving at the expense of native ground-covers (especially herbs) in this area which is relatively dry and open for Herb-rich Foothill Forest.
 - Blackberries occur in large, high, dense thickets along many gullies, mostly south of Barjarg Rd and typically affecting Damp Forest EVC. Infestation is often severe in the gullies where it occurs and can be absent in seemingly comparable gullies nearby; often different disturbance histories explain such anomalies.
 - As mentioned above, along the northern edges of the IPA there are sizeable areas with varying level of weediness indicative of a history of domestic stock grazing such as pasture grasses, rows and woodlots of pines, and patches of blackberries and sweet briar.
- Feral pig, goat, sambar and fallow deer have been recorded in the IPA. Fallow deer records are mostly in the northern part of the IPA, goats in the southern part and pigs and sambar records are across the IPA but concentrated on the tableland between Mt Barranhet and Mt Strathbogrie. On the limited information available, abundance of and damage done by these species in the IPA is similar to that in comparable forests in the region but local residents report Sambar numbers increasing.

24 VEAC (2013) *Remnant Native Vegetation Discussion Paper*

- Figure 3.7 shows a remarkable absence of wildfire in the IPA: in the southwest corner (including some outlying blocks) about 1000 hectares of the IPA was burnt in 1990, and about 150 hectares was burnt in 2015. This paucity is probably part of the reason so much of the forest is in such good condition.
- Levels of recreational use and related disturbances seem lower than many comparable state forests: low levels of use for horse-riding and mountain bike riding, higher (but still moderate) levels of four wheel driving and trial bike riding, with relatively few unplanned illegal 'single' (one tyre width) tracks. However, even this relatively low level of off-road vehicle activity can lead to high levels of damage e.g. near Rocky Ned Falls and White Gum Gully.

3.3 Geological and geomorphological values

Most of the Strathbogie Ranges IPA is on Strathbogie Granite and on the related Violet Town Volcanics that blankets the northern margin of the granite. Significant parts of the IPA extend south into Melbourne Zone metasediments that lie in the Strathbogie Granite contact aureole and beyond, including into the area of the Tallangalook Goldfield. The IPA covers significant northern parts of the 'Glen Creek Inlier' of older Selwyn Block rocks, which include Cambrian age calc-alkaline Volcanics.

Multiple old mines are mapped across the southern half of the Strathbogie Ranges IPA, with a cluster of around ten old mine shafts near the current Crystal King mine. This group of shafts of the Crystal King quartz mine forms the only site in Victoria where systematic mining for piezo-electric quartz crystals (for such uses as radio transmitters) was carried out.

The Geological Society of Australia's list of Geologically Significant Features includes the Tallangalook Crystal King Mine as regionally significant. Further assessments in this area are currently underway.

3.4 Water and catchments

The Strathbogie Ranges IPA straddles the Goulburn and Broken river basins and forms part of the catchment area for four designated catchment areas. Also see sections 2.3 and 3.5.5.

3.5 Cultural heritage, social and economic values

3.5.1 Non-Aboriginal cultural heritage

While there are no recorded historic sites in the IPA on the Victorian Heritage Register or the Victorian Heritage Inventory, the IPA is rich in history associated with the mining of gold, particularly alluvial mining and early Chinese settlement. Gold was first found at Hells Hole Creek in 1851, soon after gold had been discovered in Victoria for the first time near Clunes in 1850.

The main goldfields sites are on the southern edge of the IPA mostly in the adjacent Tallangalook-Dry Creek Historic Reserve. There are three recorded historic sites on the Victorian Heritage Inventory located adjacent to the Strathbogie Ranges IPA in the Tallangalook-Dry Creek Historic Reserve. The three sites are Cocker's Sluice Hole, Clear Creek Alluvial Workings and Tallangalook Creek Alluvial Workings.

The Strathbogie forests have also been a source of millable timbers since the late 1800s. Several mills were established within the forest to supply the demand for timber for mining, construction and railway building.

3.5.2 Timber harvesting

Since the creation of the Immediate Protection Areas by the Victorian government in 2019, there has been no timber harvesting in the Strathbogie Ranges IPA.

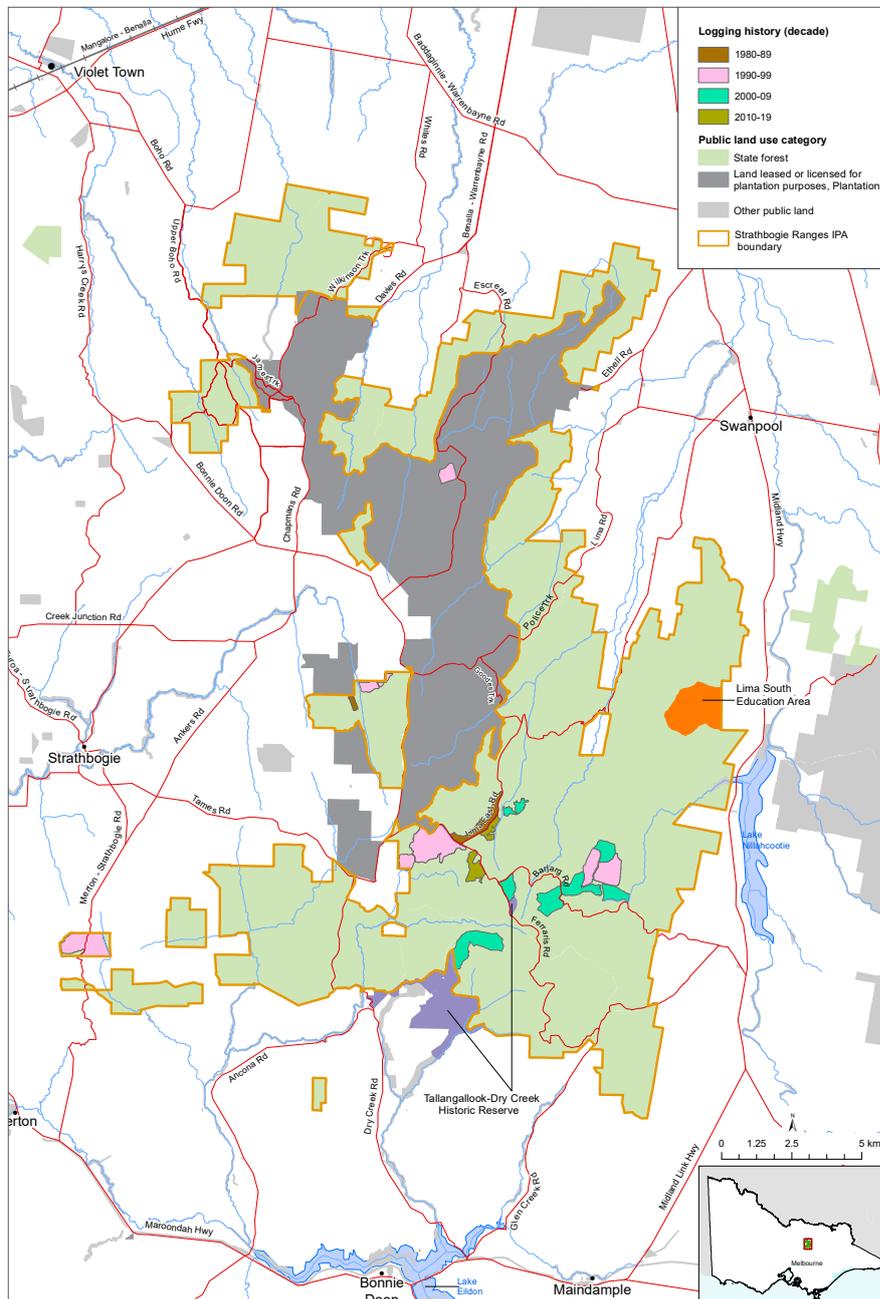
Logging history

As shown in figure 3.5, logging in the Strathbogie Ranges IPA since the late 1980s has largely taken place in the central forests on either side of Barjarg Road and on the southern part of the elevated areas of Lightning Ridge. While it is very likely that there would have been logging in the IPA prior to those shown on the map, comprehensive records were not kept prior to the 1990s.

The most recent coupes to be logged in the IPA include Parlours Creek (in 2016-17) and Barjarg Flat (2017-18), with both coupes logged using the silvicultural system of single tree selection.

The current timber release plan includes two coupes within the IPA (both in previously logged areas, Barjarg Flat coupe and Ferraris coupe) that are scheduled for stand management.

Figure 3.5 Recorded logging history in the Strathbogie Ranges IPA



Forest management zones

The current forest management zoning for the Strathbogie Ranges IPA is shown in figure 3.6. About 80 per cent of the IPA is General Management Zone. The remainder is almost entirely Special Protection Zone with some very small areas of Special Management Zone in specific areas to protect certain flora. The Special Protection Zones are mostly located in the central section of the IPA around the Too-rour and Lima plantations between Strathbogie and Swanpool. There is also a large area of Special Protection Zone (562 hectares) in the northwest corner of the IPA near Boho and several Special Protection Zones in the southern part of the IPA near Barjarg, Tallangalook and Strathbogie South ranging in size from less than a hectare to 947 hectares.

Figure 3.6 Forest management zones in the Strathbogie Ranges IPA

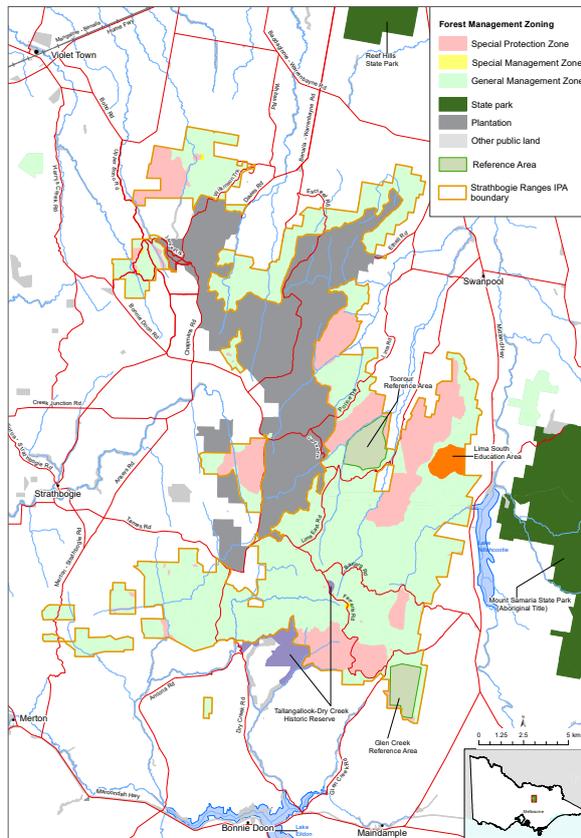
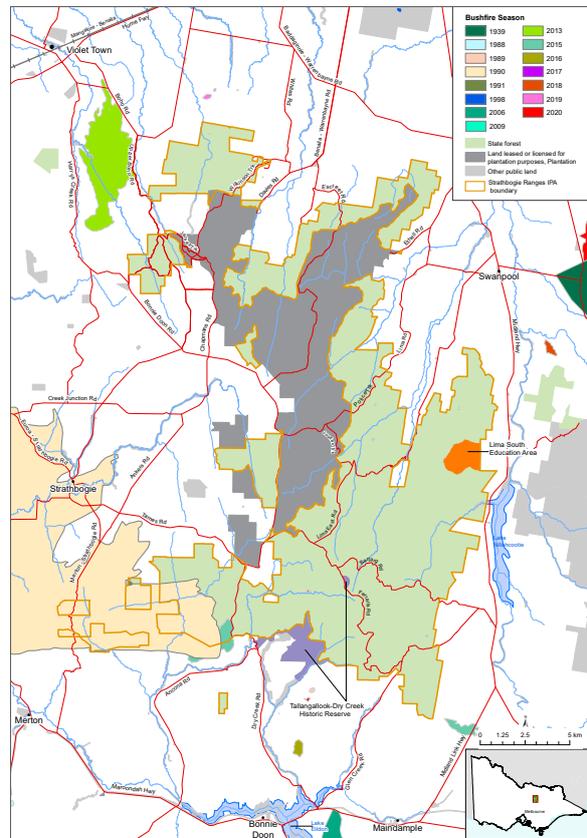


Figure 3.7 Wildfire history in and surrounding the Strathbogie Ranges IPA



Wildfire history

The Strathbogie Ranges remains mostly unburned by wildfires in recent decades, with only small areas in the southwest corner of the IPA affected by wildfire in 1990, 1991 and 2015. Several other small areas across the IPA (with a maximum size of about 2 hectares) were affected by wildfires in 2015, 2016 and 2020 (see figure 3.7).

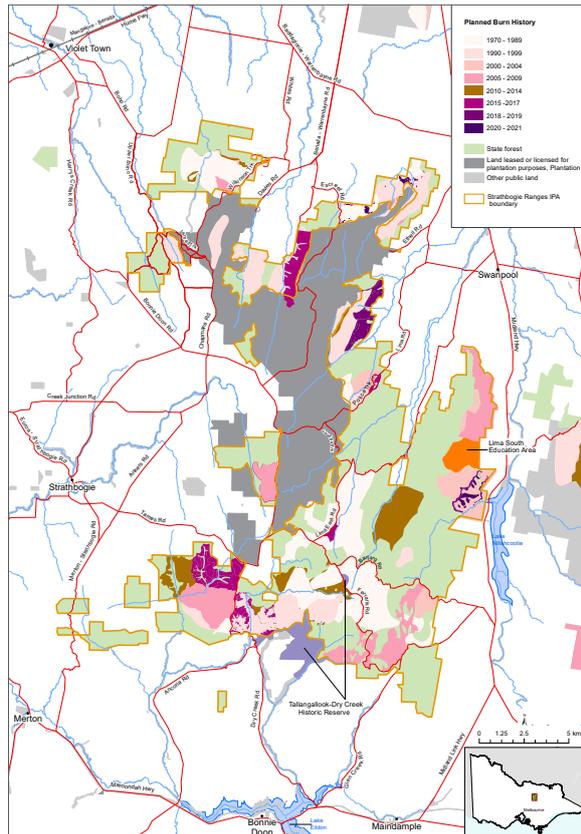
Planned burn history

Since the 1970s, planned burns have been carried out over much of the Strathbogie Ranges IPA. Most of the southern third of the IPA as well as areas adjacent to plantations in the northern half have been burnt as part of planned burning (see figure 3.8).

Areas where planned burns have not been carried out include east of Lightning Ridge Track (around Sandy Creek), west of the Lima South Education Area and around Charnwood, and near the Rocky Ned walking track and lookout and waterfall.

Other areas that have not been burnt in planned burns include the Lima South Education Area, Toorour Reference Area, Glen Creek Reference Area and the southwest corner of the IPA that was affected by wildfire.

Figure 3.8 Planned burn history in the Strathbogrie Ranges IPA



Domestic firewood

Information provided by land managers shows that since 2017, the number of firewood collection areas made available each season (spring and autumn) in the Strathbogrie Ranges IPA has varied between five and ten areas and many of these areas have been carried over multiple years. The areas are reasonably evenly distributed across the IPA and where possible, have been located opportunistically to take advantage of 'salvage' wood (such as allowing collection in areas prior to a planned burn, or fallen timber associated with weather events and forest management activities). In previous years, VicForests timber harvesting coupes would have also been made available for the public collecting logging debris post-harvest.

While there are no data available to quantify the volumes of timber collected since 2011 and the cessation of the permit system, land managers report increasing pressure on the forests of the Strathbogrie Ranges because of declining supply west of the Hume Highway and accessibility issues in many of the forests to its east.

Under recent changes, firewood collection from designated areas in state forests within parts of Central Victoria are restricted to residents of specific local government areas.²⁵ While these restrictions do not apply to the forests within the Strathbogrie Ranges IPA (which is located just outside of the mapped area for which the restrictions apply), residents from Strathbogrie Shire are permitted to collect firewood from the restricted areas.

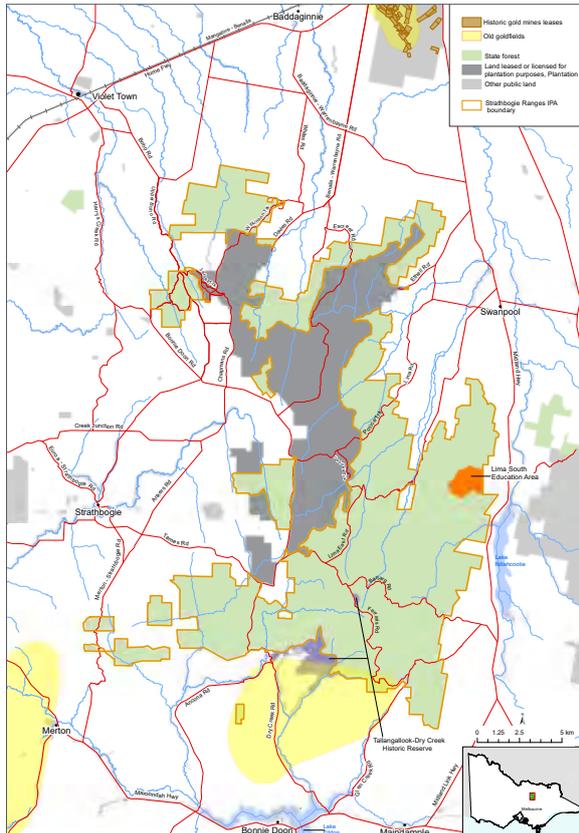
25 <https://www.ffm.vic.gov.au/media-releases/new-rules-for-central-victorian-firewood-collection-areas>

3.5.3 Earth resources

Mining activity

Historical gold mining activity in the Strathbogrie Ranges is limited with historic mining leases occurring north of the IPA in Reef Hills State Park and mapped goldfields covering the Tallangalook-Dry Creek Historic Reserve and a small area at the south of the IPA (figure 3.9)

Figure 3.9 Historic gold mining areas



Note: The historic gold mine leases layer (obtained from the Victorian Spatial Data Library) displays expired gold mining leases from the 1860s to 1958. The goldfields layer displays spatial information compiled by the Geological Survey of Victoria in 1993 and supplied to VEAC by the Department of Primary Industries in 2012.

As shown in figure 3.10, there are two mining licences within the Strathbogrie Ranges IPA. One is located south of Goldsworthys campground near the corner of Dry Creek Road and Ruocks Road and is for crystals and gypsum. The other mining licence (the Crystal King mine) is located off Barjarg Road south of the Ferraris timber harvesting coupe and is for crystals. Both licences cover small areas of 5 and 1 hectares respectively.

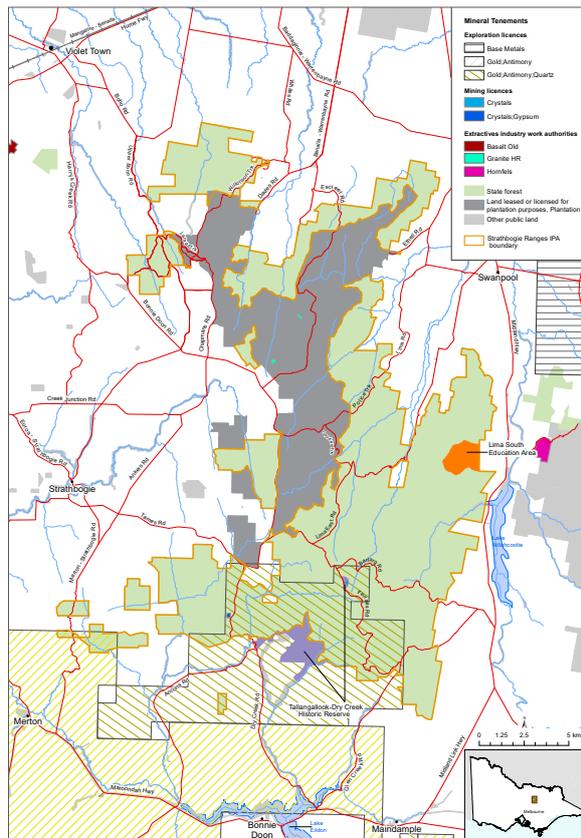
There are two current exploration licences covering parts of the southern end of the IPA near Merton (for gold and antimony) and near the Tallangalook-Dry Creek Historic Reserve (for gold, antimony and quartz). One exploration licence application covering the eastern edge of the IPA was recently lodged but has since been withdrawn.

There are no prospecting licences or work authorities within the IPA.

There are two current work authorities (for granite) that are outside of the IPA but in the adjacent plantation land near Boho South. These allow the authority holder (Hancock Victorian Plantations Pty Limited) to extract stone resources in the work authority area.

There are no mapped extractive industry interest areas located within or nearby to the Strathbogrie Ranges IPA.

Figure 3.10 Earth resources tenements within and surrounding the Strathbogies Ranges IPA



Mineral resource potential

A review of the mineral resource potential of the Strathbogies IPA by the Geological Survey of Victoria (GSV) in the Department of Jobs, Precincts and Regions found that prospectivity in the Strathbogies Ranges IPA is focused mostly on the potential for minerals in the southern parts of the IPA.

The southern parts of the Strathbogies Granite contain a variety of proven mineral and stone resources, including industrial feldspar resources, gemstone-quality quartz in pegmatite dykes, and cassiterite (Tin) mineralisation.

The review found that there is potential for mineral deposits (such as gold) to be found in the rocks adjacent to the Strathbogies Ranges granite and for mineral deposits (such as lithium, tantalum and tin) to be found in the Strathbogies Ranges granite.

High geological prospectivity for gold, and proven gold production, are the reasons the southern parts of the IPA lies under active Mineral Exploration licences for orogenic gold.

The GSV found that the area is not considered prospective for extractives, but that it is located near to a substantially sized quarry at Lima South, which provides high quality aggregates and road bases in the north-east area right through to Bendigo.

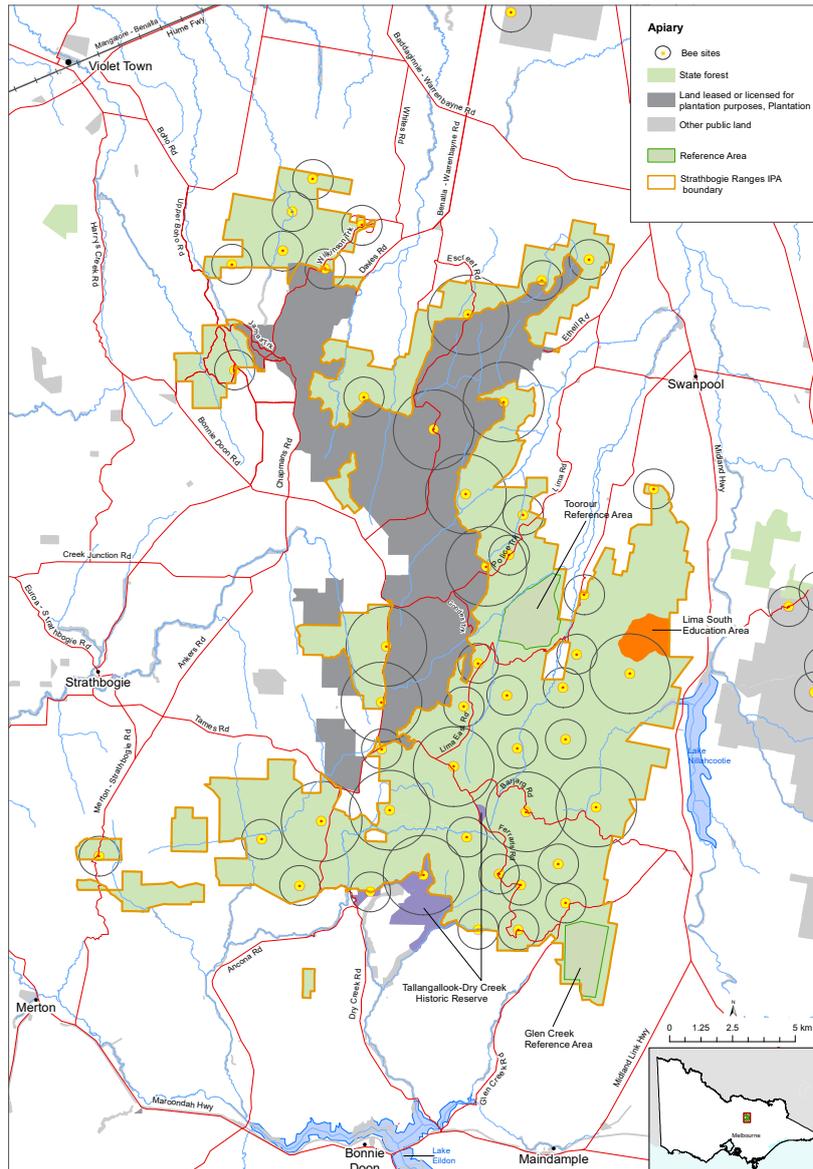
3.5.4 Apiculture

There are 44 bee sites in the Strathbogies Ranges IPA of either 1600 metres or 3200 metres diameter. An additional six bee sites are located just outside of the IPA but have base ranges that overlap with the IPA. Approximately 60 per cent of the IPA is covered by these base ranges and sites are reasonably evenly distributed with some clustering of sites around some of the main access tracks in the southern part of the IPA such as Barjarg Road and Ferraris Road. The areas without bee sites

include the reference areas and areas that are steep and difficult to access. Figure 3.11 shows the location of the bee sites in and around the IPA.

Apiculture utilises public land for both production of honey and to rest bees before undertaking pollination of private agricultural crops, particularly almond orchards near Robinvale. For this reason, public land close to Robinvale, or within a day’s drive of the almond orchards, is typically densely covered by bee sites so bees can be rested nearby to the crops. The Strathbogrie Ranges are approximately five hours drive from Robinvale making the IPA a potential resting area for bees on the way to pollinating agricultural crops.

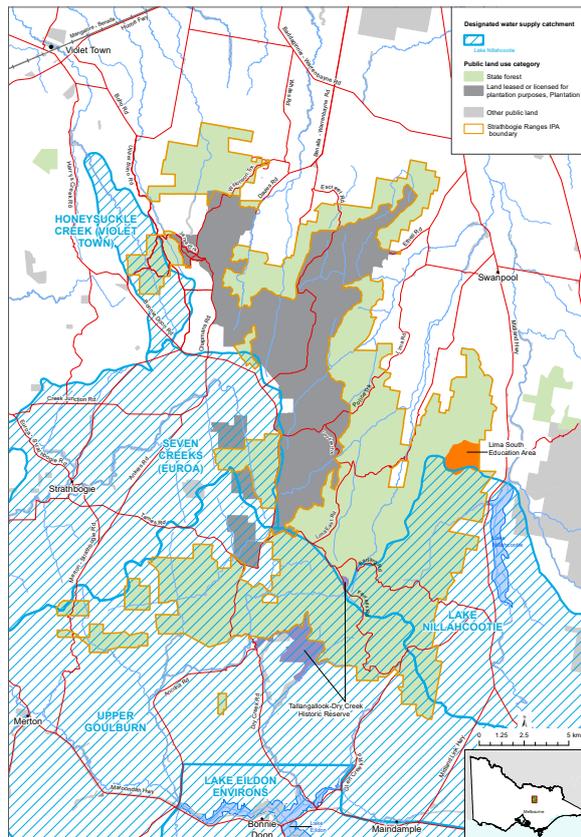
Figure 3.11 Bee sites within and surrounding the Strathbogrie Ranges IPA



3.5.5 Water production and supply

The southern and western areas of the Strathbogrie Ranges IPA are covered by parts of four designated water supply catchment areas for Violet Town (Honeysuckle Creek), Euroa (Seven Creeks), the Upper Goulburn and Lake Nillahcootie (see figure 3.12).

Figure 3.12 Designated water supply catchment areas overlapping the Strathbogie Ranges IPA



As shown in figure 2.3 in chapter 2, the northwestern and southwestern parts of the IPA form part of the catchment for the Goulburn River while the remainder of the IPA is part of the Broken River catchment. Lake Nillahcootie is managed by Goulburn-Murray Water and is the main storage on the Broken River. Water is harvested from the river to support stock and domestic supply as well as irrigated agriculture. Almost all of Lake Nillahcootie is on the eastern side of the Midland Highway and outside of the IPA. However, the Midland Highway passes over a small arm of the lake, which is partly located within the IPA.

3.5.6 Recreational uses

Campgrounds and recreation sites

There are three formal campsites in the Strathbogie Ranges IPA (Ruoaks, Goldsworthys and James Reserve). Ruoaks and Goldsworthys are both small campgrounds with basic amenities such as fire pits/ wood barbeques and picnic tables. James Reserve is a larger camping area and provides drop toilets in addition to fire pits/wood barbeques and picnic tables. James Reserve also has horse yards to facilitate a lunch or overnight stop while horse riding in the forest. All three campsites are located near to roads with easy access to James Reserve and reasonable access to Ruoaks and Goldsworthys (tracks could be challenging in wetter seasons).

There is evidence that numerous other clearings throughout the forest are utilised for camping, such as a clearing near Gum Drop and White Gum Gully where there is evidence of campfires. As part of the Victoria's Great Outdoors initiative, two new campsites are being established near Rocky Ned falls and a short walking trail will lead from the campsites to the waterfall.

Day visitor areas include Lima East and Tallangalook Road picnic areas and Hells Hole. Hells Hole is located on the southern boundary of the IPA immediately adjacent to the Tallangalook-Dry Creek Historic Reserve and has picnic tables and information signs about the area's gold mining history.

There are two major walking tracks within the IPA: Lima Falls walking track and Rocky Ned walking track. The Lima Falls walking track is a short (1.2 kilometres return) walk along the White Gum Gully Creek to a small, pretty waterfall.

The Rocky Ned walking track is a short (1.7 kilometres return), pleasant walk through open woodland up to a granite rocky outcrop (with safety railing installed some years ago). At almost 700 metres elevation, the lookout provides expansive views to the east stretching all the way to Victoria's high country and views southeast across the Strathbogie forest towards Lightning Ridge and Mount Strathbogie.

Large granite boulders are a feature of the Strathbogie Ranges. At Wild Dog Rocks, a short walk from the picnic area leads to a rocky outcrop and nice scenic views. A short, steep walk from the Lima East picnic area leads to impressive granite boulders and another opportunity for landscape views. Various mountains in the Strathbogie Ranges IPA including Mount Strathbogie and Golden Mountain also offer excellent views across the region.

Activities

Heatmaps from the fitness-tracking app Strava for the IPA²⁶ indicate relatively low use. The heatmaps suggest that, for walking/running/hiking, the highest usage occurs around the northeast lobe of the IPA between Warrenbayne and Lima (particularly around Mount Buggaree and Hoskin Hill), as well as Rocky Ned walking track and lookout, Lima Falls walking track, Sandy Creek Falls and Wild Dog Rocks.

For cycling, the Strava heatmap suggests most usage is concentrated around some of the major access roads such as Lima East Road, Police Track, Tames Road and Barjarg Road. Similarly, usage appears higher in the southeast of the IPA near a visitor accommodation provider with facilities for large groups and an extensive track network on their property.

Land managers report that trail bike riding and four-wheel driving are popular recreational uses in the Strathbogie Ranges IPA. Key areas include Lightning Ridge for four-wheel driving and a windy track near Sandy Creek for trail bike riding. Land managers also suggested there have been increases in hunting in the IPA, especially in the north around Umbrella Hill.

There is evidence of horse riding and mountain bike riding in the IPA. A suggested cycle tour (for road and gravel bikes) passes through the IPA along Bonnie Doon Road and visits nearby towns such as Ruffy, Euroa, Strathbogie and Violet Town. The 134-kilometre Great Victorian Rail Trail, one of Australia's longest continuous rail trails, goes from Tallarook to Mansfield and passes through Bonnie Doon and Merton, both located just south of the Strathbogie Ranges IPA.

Land managers report an increase in visitation of the Strathbogie forest during the Coronavirus (Covid-19) pandemic. Anecdotal evidence suggests that many of these visitors were new to visiting the forest and often had not camped before. Across Victoria, increased visitation has necessitated an increase in management and maintenance of facilities on public land.

The forests in the IPA are used occasionally for large organised recreational events such as charity motorcycle rides, car rallies and four-wheel driving tours.

There is little information on or evidence of recreational prospecting or fossicking in the IPA. Anecdotally parts of the IPA are of casual interest to gem collectors and gold panning may be an occasional use, particularly near the boundary of or in the adjacent historic area.

3.5.7 Tourism

The forests of the Strathbogie Ranges are popular with local residents and many of the recreational uses described above also attract visitors from further afield. The Strathbogie Ranges IPA is well positioned close to the Hume Freeway and is around two hours from Melbourne and between 1-2 hours drive from surrounding regional centres such as Shepparton, Wangaratta, Bendigo and Wodonga.

²⁶ Strava heatmaps shows 'heat' made by aggregated, public activities over the last year.

Wineries as well as cafes and restaurants in surrounding areas attract visitors. Nearby Lake Eildon and the Great Victorian Rail Trail are popular and encourage visitors to the area.

In recent years, as part of their Tracks and Trails Strategy, the Shire of Strathbogie which covers the western edges of the IPA has mapped many tracks and trails in their region and developed an online mapping tool (available via their website) to promote their use and attract visitors. While only some of the IPA is within the Shire of Strathbogie, they have included the whole Strathbogie forest in their mapping. As well as the Lima Falls and Rocky Ned tracks, mapped walks within the IPA include:

- Umbrella Hill Walk, Boho
- Cleos Track, Creek Junction
- North Creek Walk, Strathbogie Forest
- Whites Rock Walk, Creek Junction
- Golden Mountain Walk, Strathbogie Forest

There are eight licensed tour operators operating within the Strathbogie State Forest. The licences are for various activities including outdoor education, four-wheel driving, trail bike riding and bushwalking.

3.5.8 Education

The Strathbogie Ranges IPA contains one education area (approximately 275 hectares, the Lima South Education Area. It is located on the eastern side of the IPA, near Lake Nillahcootie. See section 1.7 for information about the relevant government-accepted LCC recommendation.

Land managers advise that the education area is used by one outdoor education provider.

There are several outdoor education providers based nearby to the IPA, including Auscamp's Charnwood Outdoor Centre which is located on private land that is fully surrounded by the IPA. According to land managers, Auscamp is the main outdoor education camp that is using the Strathbogie Ranges IPA.

3.5.9 Licensed uses and leases of Crown land

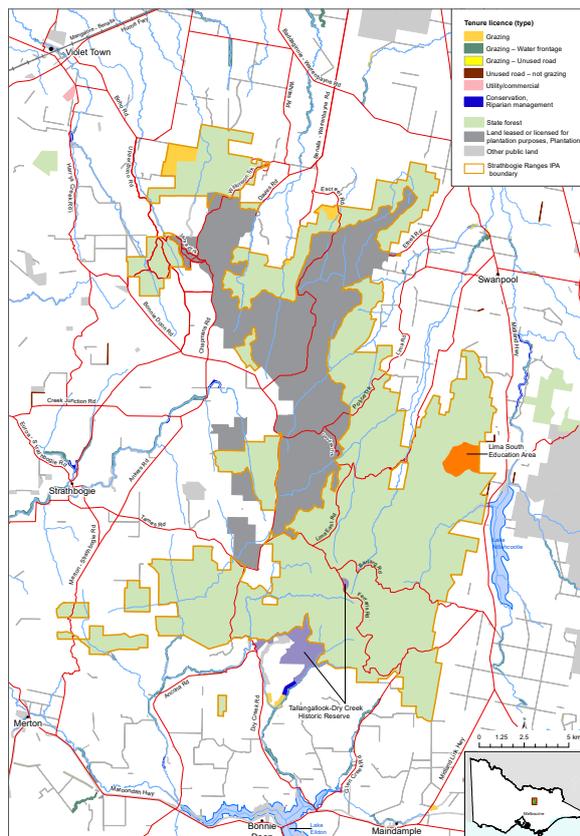
Unused road licences

There are eight unused road licences that fall either entirely (two licences) or partly (six licences) within the Strathbogie Ranges IPA (see figure 3.13).

The two unused road licences that are entirely within the IPA are located on the eastern side near Lake Nillahcootie. Both licences are small with one covering a total area of half a hectare (0.57 hectares) and the other less than a quarter of a hectare (0.16 hectares).

For the six unused road licences that are partly within the IPA, only small amounts of each licence are in the IPA.

There are 17 unused road licences that abut the IPA but do not have any of the licence area in the IPA.

Figure 3.13 Crown land licences within and surrounding the Strathbogies Ranges IPA

Grazing licences

There are five current grazing licences in the Strathbogies IPA covering 270 hectares in total. All five grazing licences are in the northern half of the IPA with the largest licence located in the northwest corner just east of Boho and covering 199 hectares. Three licences are located near Warrenbayne and cover areas of 5, 5 and 60 hectares each. The smallest licence (1.5 hectares) is located on the west side of Lima East Road just before entering the Strathbogies State Forest.

Water frontage licences

There are no water frontage licences within the IPA. At the southern end of the IPA, there is one water frontage licence that abuts the IPA along North Creek and several other licences are located nearby along Hayfield Creek, Brankeet Creek, Tallangalook Creek and Glen Creek (see figure 3.11).

Utilities and other occupations

There is a telecommunications licence over a small area (0.1 hectares) northwest of Mount Strathbogies. The licence is held by Goulburn Valley Region Water Corporation and the site includes a tower and a tank.

Plantation land

There is a small area of plantation land within the Strathbogies Ranges IPA covering 16 hectares in the north of the IPA near Boho. This land appears to be native forest consistent with the state forest to its north.

There are large areas of plantation land that are not part of the IPA but are positioned between the various areas of native forest in the northern half of the IPA. This plantation land surrounding the IPA is former Victorian Plantations Corporation (VPC) land licensed to HVP Plantations with the right to operate a plantation business on that land in perpetuity.



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.

The report from Taungurung Land and Waters Council assessing the biocultural values of the Strathbogrie Ranges IPA, reproduced in section 3.1, addresses some of the threats to values and to Traditional Owner values, rights and interests.

There are several different approaches used to assess threats to biodiversity. 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 land managers. The Mirboo North IPA is very small and threats to social values need to be considered in the context of the surrounding areas of forested public land.

4.1 Previous and current work

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 Gippsland Regional Forest Agreement (RFA) in 1999.²⁸ 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.²⁹

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.

²⁷ See <https://www.veac.vic.gov.au/investigations-assessments/previous-assessments/investigation/conservation-values-of-state-forests-assessment-report>

²⁸ See https://www.awe.gov.au/sites/default/files/sitecollectiondocuments/rfa/regions/vic-gippsland/regional-assessment/vic_gippscra.pdf

²⁹ See *Assessment of matters pertaining to the modernisation of Victoria's Regional Forest Agreements 2019* at https://www.awe.gov.au/sites/default/files/documents/qid78487_att_a_-_further_assessment_of_matters_report_2019.pdf

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.

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 Gippsland RFA.

Table 4.1 Potentially threatening processes identified in comprehensive regional assessments for the North East RFA.

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 325 action statements have been developed for threatened species, communities and threatening processes listed under the Act, although there are advanced drafts for others.

In 2021, the Victorian Auditor-General's Office (VAGO) reported on how well DELWP is acquitting its responsibilities under the FFG Act and in Biodiversity 2037 to better protect threatened species.³⁰

VAGO noted that the backlog of action statements has only worsened since a previous audit in 2009 due to the increased number of listed species following FFG Act amendments in 2019. Only 20 per cent of listed species, excluding communities and potentially threatening processes, 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 37 potentially threatening processes listed under the FFG Act of which 12 have action statements (excluding those relating exclusively to marine and estuarine environments). There have been no additions to the list of potentially threatening processes since December 2016.

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 relatively high significance for forest biodiversity in the assessment area 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.

30 <https://www.audit.vic.gov.au/sites/default/files/2021-10/20211013-Protecting-Victoria%27s-Biodiversity.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 (current as of December 2016)

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 <i>Nothofagus</i> -dominated Cool Temperate Rainforest
Infection of amphibians with Chytrid Fungus, resulting in chytridiomycosis
Invasion of native vegetation by Blackberry <i>Rubus fruticosus</i> 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, <i>Felis catus</i>
*Predation of native wildlife by the introduced Red Fox <i>Vulpes vulpes</i>
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 (<i>Linepithema humile</i>)
*Prevention of passage of aquatic biota as a result of the presence of instream structures
Reduction in biodiversity of native vegetation by Sambar (<i>Cervus unicolor</i>)
Reduction in biodiversity resulting from Noisy Miner (<i>Manorina melanocephala</i>) populations in Victoria
Reduction in biomass and biodiversity of native vegetation through grazing by the Rabbit <i>Oryctolagus cuniculus</i>
Soil degradation and reduction of biodiversity through browsing and competition by feral goats (<i>Capra hircus</i>)
*Soil erosion and vegetation damage and disturbance in the alpine regions of Victoria caused by cattle grazing
Spread of <i>Pittosporum undulatum</i> in areas outside its natural distribution
The spread of <i>Phytophthora cinnamomi</i> 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 <i>Apis mellifera</i> of nesting hollows and floral resources
Use of <i>Phytophthora</i> -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, the Victorian Auditor-General's Office (VAGO) noted the move away from single-species planning and management. Instead, DELWP'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 DELWP 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 the Arthur Rylah Institute. 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.

4.1.4 Environment Protection and Biodiversity Conservation Act (Cwlth)

As of July 2019, there were 56 EPBC Act listed fauna and flora species known or likely to occur within the Gippsland RFA region. Since the commencement of the EPBC Act in 1999, 22 additional species known or likely to occur in the North East RFA 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. 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. Of these 11 are potentially relevant to the Strathbogrie Ranges IPA.

Table 4 3 EPBC Act listed key threatening processes potentially affecting threatened species in the Strathbogrie Ranges IPA³²

Potential high significance for forest biodiversity
Competition and land degradation by rabbits
Dieback caused by the root-rot fungus (<i>Phytophthora cinnamomi</i>)
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

32 <http://www.environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl>

4.2 Climate change

The most notable change since the original comprehensive regional assessments more than 20 years ago is the increased attention given to climate change and its potential effects on biodiversity. It is recognised that climate change is likely to exacerbate and alter the nature of other threats, as well as increase the frequency and severity of 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

Victoria's Natural Environment Climate Change Adaptation Action Plan 2022-26 released earlier this year notes that Victoria's natural environments are already experiencing early impacts of a changing climate and these impacts are expected to increase through this century. Victoria's climate has changed in recent decades, becoming warmer and drier. These changes are expected to continue in the future.³⁴

Across Australia, climate change will 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 effects of climate change on terrestrial biodiversity will have cultural, social, and economic impacts including loss of ecosystem services such as clean water, pollinators and amenity.³⁵

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 will require multidisciplinary research that includes both biophysical and socio-political issues and sophisticated analytical approaches that integrate the variable contributions of stressors and their socioecological interactions.³⁶

4.3 Pressures from increasing population and human use

4.3.1 Population projections

Victoria's population was 6.5 million at 30 June 2018. It is the second largest state in Australia by population, but has been growing by more than any other state or territory and at the highest rate of up to 2.5 per cent per annum. Victoria has grown by a million people since 2011 and is expected to add another million by 2026.

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.³⁷

The COVID-19 pandemic has disrupted these projections, and new projections are not yet available. The most recent report in 2019 predates the COVID-19 pandemic.³⁸ It projected that the population of Victoria is expected to grow from 6.5 million people in 2018 to 11.2 million in 2056. Greater Melbourne is projected to grow by approximately 4.0 million people, increasing from 5.0 million in 2018 to 9.0 million in 2056.

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 See <https://www.environment.vic.gov.au/natural-environment-adaptation-action-plan>

35 <https://nccarf.edu.au/wp-content/uploads/2019/04/Impacts-on-Terrestrial-Biodiversity.pdf>

36 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,.

37 See <https://www.planning.vic.gov.au/land-use-and-population-research/victoria-in-future>

38 https://www.planning.vic.gov.au/__data/assets/pdf_file/0032/332996/Victoria_in_Future_2019.pdf

The Australian Bureau of Statistics has analysed the impact of COVID-19 on Australia's population and components of growth in the year 2020.³⁹ COVID-19 had a dramatic impact on Australia's population in 2020. International travel and overseas migration slowed to a trickle, interstate migration patterns were disrupted, while births and deaths continued with relatively little change. Changes in overseas and interstate migration due to COVID-19 disruptions meant that the ACT, Queensland and Victoria all had net overseas migration losses in the 2020 calendar year. While the total number of interstate movements was comparable to previous years, interstate migration patterns changed markedly in 2020. In the last decade, more people moved to, rather than from Victoria. In 2020 however, Victoria had a net loss of people to other states and territories.

There is some information available on the intrastate movements of people between capital cities and regional locations, although experts opinions are mixed on whether the impact that COVID-19 is having on migration between regional areas and capital cities will be sustained.⁴⁰ The first release of new ABS data - the provisional regional internal migration estimates - confirmed that COVID-19 is affecting people's decisions about where to live. The data also confirmed that there has been a net shift in favour of regional areas. Melbourne had a net outflow of residents in the year to September 2020, that was 25 times larger than the outflow observed the previous year.

4.3.2 Impacts on the use of 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 northern Melbourne subdivisions and estates to the Strathbogrie Ranges 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 Strathbogrie Ranges, is sustained, it would also be expected to increase use of the IPA in the future.

The impacts of COVID-19 travel restrictions on the levels and patterns of use of public land are not yet fully known. However there is some information on increased levels and altered patterns of domestic tourism, and anecdotally there are reports of increased visitation to parks, forests and other public land and open spaces close to where people live.

39 <https://www.abs.gov.au/articles/population-change-2020>

40 Centre for Population (2020) Migration between cities and regions A quick guide to COVID-19 impacts. Commonwealth of Australia. <https://population.gov.au/sites/population.gov.au/files/2021-09/the-impacts-of-covid-on-migration-between-cities-and-regions.pdf>



05 Public land use categories commensurate with the values of the Strathbogrie Ranges IPA

This chapter addresses the topic in (d) of the terms of reference: to identify the typical land use categories commensurate with the identified values in chapter 3.

Council acknowledges that the report provided by Taungurung and reproduced in section 3.1 of this report is proposing a different approach to that arrived at by VEAC through its assessment and described below. VEAC supports this discussion continuing through the processes of the Eminent Panel for Community Engagement. This will enable a shared understanding to be reached regarding the possible management, planning and governance arrangements for the different public land categories while the landmark reforms to public land legislation are finalised.

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.

In VEAC's Statewide Assessment of Public Land (2017) it was recommended that a rationalised and consolidated system of public land use categories be adopted of 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.⁴¹ VEAC also recommended explicitly stating that one of the 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.

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.

The government accepted VEAC's recommendation to rewrite Victoria's public land legislation. A consultation paper was released for public comment 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 to work alongside the Public Land Act.⁴² The Public Land Act will replace the Land Act, the Crown Land (Reserves) Act and the Forests Act.

The consultation paper re-instated 'forest park' and 'metropolitan park' categories which VEAC had consolidated into 'regional park'. A 'forest park' category is a sensible response to the changed State forest landscape across Victoria after the phasing out of timber harvesting in all native forests on public land by 2030.

The Victorian government has committed to enabling 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.

⁴¹ <https://www.veac.vic.gov.au/investigations-assessments/previous-investigations/investigation/statewide-assessment-of-public-land>

⁴² <https://engage.vic.gov.au/renewing-victorias-public-land-legislation>

5.2 Identifying typical land use categories

Much of the work of VEAC has involved recommendations for public land use. This involves considering the following matters:

- 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 uses
- 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
- ease of public understanding e.g. avoiding unnecessary complexity in allowed uses or boundaries.

In addition to these considerations VEAC adopts the principle where possible of avoiding foreclosure of future options for environmental protection.

Following assessment and analysis of available information and any commissioned research, VEAC maps the public land use category or categories which have the best alignment of purpose and allowed uses and activities for the areas under investigation or assessment.

Usually at this point in investigations, VEAC and its predecessors would prepare draft recommendations and formally seek public comment on them before finalising recommendations to government.

For the Immediate Protection Areas in the state forests in eastern Victoria, including the Strathbogrie Ranges IPA, the EPCE will undertake consultation on the VEAC assessments and provide final advice to government.

5.3 Strathbogrie Ranges IPA

The patterns of uses and values in the Strathbogrie Ranges IPA are complex. This is mostly a function of its size (24,200 hectares), and its varied landscape features (the tableland, waterways, rocky outcrops), level of access and surrounding land use, including plantations (see figure 2.1).

Of the 19+ public land use categories referred to in section 5.1, some are clearly unsuitable for the Strathbogrie Ranges IPA. These include categories such as utilities and government services reserve, alpine resort, plantation, and the marine and coastal categories.

Of the potentially suitable categories, State forest was also excluded from further consideration as its purpose in part is to provide for harvesting of hardwood timber and other forest products. This purpose is inconsistent with the announcement in 2019 that the Victorian government is immediately protecting more than 96,000 hectares of high conservation forest.

Several activities would be managed in the same way across all the public land use categories under consideration as follows:

- timber harvesting for sawlogs and pulpwood is not permitted
- apiculture is allowed
- the rules for four wheel driving and trail bike riding are the same across parks, forests and other public land.

Six public land use categories were identified as potentially commensurate with the identified values of the Strathbogrie Ranges IPA: national park, conservation park, forest park, regional park, nature reserve and bushland reserve. A description of the characteristics and purpose of each of these categories is included in table 5.1 together with a summary of VEAC's assessment of their suitability.

The purposes of each category should be read together with an over-arching purpose to protect the rights and interests of Traditional Owners and native title holders and their cultural values.

Table 5.1 Assessment of typical public land use categories

Public land category	Characteristics and purposes ⁴³	Assessment summary
National park	<p>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</p> <p>Purposes</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • addresses threats from timber harvesting in accordance with government decisions • central part (approximately 15,000 hectares) of IPA has outstanding natural values • national parks are generally larger and more intact • some reduced scope for recreational activities not usually allowed in national parks (e.g. walking, camping with dogs, horse riding) • exempt Crown land for the purposes of mineral resources legislation ie generally not available for new exploration or mining (compared with restricted Crown land for other protected areas)
Conservation park	<p>Land often linear in shape (e.g. coastal park) with natural features, flora and fauna of landscape or conservation significance</p> <p>Purposes</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • addresses threats from timber harvesting in accordance with government decisions • consistent with biological and ecological values and improves protected area representation of under-represented EVCs, of particular importance in the Central Victorian Uplands bioregion in the north of the IPA and in the east near Lake Nillahcootie • can accommodate a low level of recreational activities more restricted in national parks (eg. horse riding, dogs)
Forest park	<p>Area of native forest providing opportunities for recreation and minor extraction of some natural resource products</p> <p>Purposes</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • addresses threats from timber harvesting in accordance with government decisions • 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 • does not improve protected area representation of under-represented EVCs (not categorised as a protected area)
Regional park	<p>Extensive areas of natural or semi-natural land close to population centres or major tourist routes or easily accessible areas</p> <p>Purposes</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • addresses threats from timber harvesting in accordance with government decisions • accommodates range of recreational uses (excluding hunting, firewood collection) • category usually applied to areas with higher visitation • does not improve protected area representation of under-represented EVCs (not categorised as a protected area)

43 From DELWP 2021 *Realising the value of Victoria’s public land: renewing Victoria’s public land legislation*

<p>Nature reserve</p>	<p>An area of land or wetland of particular importance for its significant flora, fauna, natural habitat, geology, or geomorphology</p> <p>Purposes</p> <ul style="list-style-type: none"> • Protect the natural environment, including significant species, communities and habitats of native flora and fauna. • Protect and maintain natural, cultural, or geomorphic features and natural landscapes. • Provide for low-levels of informal recreation associated with the enjoyment of nature, and education, where strictly consistent with the purposes above. 	<ul style="list-style-type: none"> • addresses threats from timber harvesting in accordance with government decisions • improves protected area representation of under-represented EVCs, of particular importance in the Central Victorian Uplands bioregion in the north of the IPA and in the east near Lake Nillahcootie • level and nature of recreational use inconsistent with strict management of nature reserves for conservation • condition of the native vegetation in some locations in the north of the IPA is poor (weedy, partly cleared or eroded) which is inconsistent with the characteristics and purposes of the category
<p>Bushland reserve</p>	<p>An area of land containing important elements of the natural environment or landscape that are of habitat or scenic significance</p> <p>Purposes</p> <ul style="list-style-type: none"> • Protect and restore the natural environment, including significant species, communities and habitats of native flora and fauna, remnant vegetation and areas with value as habitat linkages • Protect and maintain natural or cultural features and natural landscapes • Provide opportunities for informal recreation associated with the enjoyment of nature, or education, where consistent with the purposes above • Provide for sustainable, controlled, low-intensity use of natural resources where consistent with the purposes above 	<ul style="list-style-type: none"> • addresses threats from timber harvesting in accordance with government decisions • improves protected area representation of under-represented EVCs • size is larger than usual fragmented patches or linear areas of the category • characteristics and purposes of the category do not fully align with the values of the area

Other public land within the boundary of the IPA includes two reference areas, an education area, and a small inlier (estimated at 15 hectares) of the Tallangalook-Dry Creek Historic Reserve at the site of the Crystal King mine (see figure 2.1). Table 5.2 briefly describes and discusses these areas.

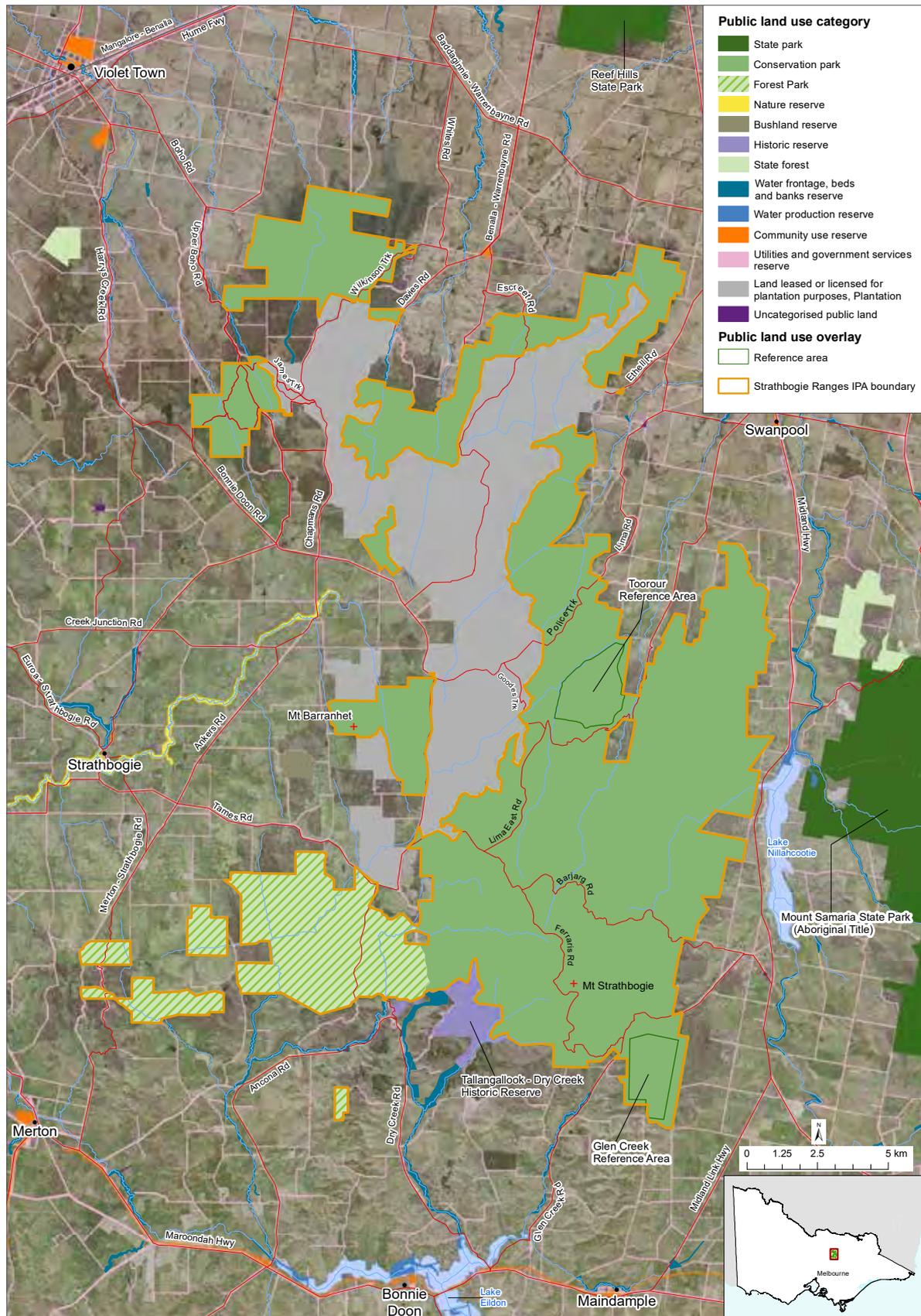
Table 5.2 Other public land within the boundary of the Strathbogie Ranges IPA

Other public land	Characteristics and purpose	Discussion
<p>Reference area (Public land use overlay)</p>	<p>Relatively small areas of public land containing viable samples of one or more land types that are relatively undisturbed.</p> <p>Purposes</p> <ul style="list-style-type: none"> • For natural processes to be allowed to continue undisturbed in perpetuity and areas to remain in their natural state as far as possible • Maintain natural systems as a scientific reference to enable comparative study of modified and unmodified lands 	<ul style="list-style-type: none"> • should be retained • manage an appropriate width of the surrounding public land as a buffer (width of buffer depends on the activity on the adjacent land) in accordance with government-approved LCC recommendations
<p>Historic reserve</p>	<p>An area of land containing important relics or historical associations ranging from large areas with several historic themes to small reserves with one theme</p> <p>Purposes</p> <ul style="list-style-type: none"> • Protect and maintain historic or cultural places, features, or objects. • Provide opportunities for recreation and education associated with appreciation of the history of the place, feature, or object. • Provide for sustainable, low-intensity use of natural resources where not incompatible with the purposes above. 	<ul style="list-style-type: none"> • small inlier (15 hectares) near the existing Crystal King mine of the larger historic area to the south of the IPA • values can be managed within broader land use categories
<p>Education area</p>	<p>Public land use category no longer used.</p>	<ul style="list-style-type: none"> • use for education is compatible with the existing state forest and the four 'park' land use categories in table 5.1

5.4 Conclusion

Conservation park is considered the most appropriate public land use category commensurate with the values of the central and northern parts of the Strathbogie Ranges IPA. For the remaining southwestern part of the IPA, forest park is considered the most appropriate land use category (see figure 5.1).

Figure 5.1 Suggested land use category commensurate with the values of the Strathbogie Ranges IPA



As a conservation park, these parts of the IPA would be managed for the protection of their natural and cultural values, while allowing access for a range of recreational activities. Under-represented EVCs, including those in the Central Victorian Uplands bioregion in the northern part of the IPA and in the east near Lake Nillahcootie, would be added to the protected area system. Important threatened species habitat, including many large, hollow-bearing trees would be protected from any timber harvesting.

Forest park in the southwestern part of the IPA would facilitate continued use of the forest for a broad range of activities and could more readily accommodate firewood collection, hunting, mining and recreational prospecting than regional park. Regional parks typically exclude activities such as hunting that are incompatible with large numbers of visitors.

There are significant gaps and limitations in the current legislation that pose barriers to enabling Traditional Owners' self-determination and supporting cultural land management, and the current public land legislation reforms provide an opportunity to address these. VEAC supports the future incorporation of Traditional Owners' thinking about cultural landscapes into the categorisation and management of the Strathbogie Ranges native forests, as well as reforms that enable Traditional Owners to directly manage land.



Terms used and references in the Taungurung report to VEAC regarding the assessment of the biocultural values of an Immediate Protection Area in the Strathbogie Ranges

Cultural Landscape	Cultural landscapes reflect the management and modification of Country over many thousands of generations. Cultural landscapes are both material and symbolic and include Traditional Owner societies' unique worldview, ontology, history, institutions, practices and the networks of relationships between human and non-human animals, plants, ancestors, song lines, physical structures, trade routes and other significant cultural connections to Country ¹
Country	Country includes all of the sentient and non-sentient parts of the world and the interactions between them, according to Aboriginal lore. Indigenous lore and life originates in and is governed by Country. Country must be respected. In a western conservation context, this is more aligned to a systems and resilience approach to thinking and to an active, adaptive management approach to practice ² .
Joint management	Hand back of Aboriginal Title under Traditional Owner Settlement Act Agreement. A Traditional Owner Land Management Board is established by the Minister, with Traditional Owner majority, including as chair. Rights conveyed for the TOLMB to prepare a Joint Management Plan. Parks Victoria is the Land Manager.
Collaborative governance	Arrangements in which ultimate decision-making authority resides with a collaborative body exercising devolved power – where power and responsibility are shared between government and local stakeholders ³ . Successful governance arrangements include: multiple, nested Indigenous and other institutions; common pool resource management principles ⁴ that are embedded; and with accountability mechanisms that are monitored to provide learning and adjustment in the application of principles in practice.
Collaborative management	Collaborative management (also referred to as co-management, or joint, participatory or multi-stakeholder management) as a partnership in which government agencies, local communities and resource users, non-governmental organizations and other stakeholders negotiate, as appropriate to each context, the authority and responsibility for the management of a specific area or set of resources ⁵ .
Cooperative agreements	A bundle of rights over designated Parks from Native Title Determinations. Native Title holder has an advisory role on a committee.
Sole management	Indigenous Nation's leadership in the planning, management and governance of public land. Planning through codesign, governance by the Indigenous Nation and management that enables the application of Indigenous knowledge and practice.
IUCN Category VI	Indigenous knowledge and practice led. Asset managed to cultural objectives, with ecological, social and economic co-benefits. TOs as land manager. Governance by Indigenous Nation.
IUCN Category V	Indigenous knowledge and practice led. Landscape managed to cultural objectives, with ecological, social and economic co-benefits. TOs as land manager. Shared (collaborative) governance.

1 Victorian Traditional Owner Cultural Landscapes Strategy.

2 Victorian Traditional Owner Cultural Landscapes Strategy.

3 Dodson, G. (2014), "Co-Governance and Local Empowerment? Conservation Partnership Frameworks and Marine Protection at Mimiwhangata, New Zealand" in *Society & Natural Resources* (2014) Volume 7, Issue 25, available at www.tandfonline.com

4 Ostrom, Elenor. *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge Univ. Press, New York, 1990).

5 World Conservation Council Recommendation 42. Collaborative Management for Conservation.

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The occurrence of and threats to threatened species in the Strathbogrie Ranges IPA and the importance of the IPA to their conservation

Species name	Occurrence in and importance of the IPA	Threats
Southern greater glider	Very high: The IPA supports some of the highest recorded densities of greater glider in Victoria, where the species appears not to have declined as it has over much of its range in the last 20 years. Most records are on the tableland between Mt Barranhet and Mt Strathbogrie, with few in the southwest part of the IPA and none in the northern parts closest to Warrenbayne. Maps of records and the habitat distribution model provided in appendix 3.	<ul style="list-style-type: none"> • Loss of hollow-bearing trees; bushfire; planned burning; drought; timber harvesting and hyper-predation. • Potentially more extreme droughts and heat stress as a result of climate change.
Eastern horseshoe bat	High: IPA is an important site for this species in Victoria, being one of around a dozen places (between Wallan and Mallacoota) with clusters of records – potentially indicating important roost or breeding sites.	<ul style="list-style-type: none"> • Disturbance of roosting sites in caves and mine shafts, especially when bats are hibernating or breeding. • Loss or degradation of habitat, particularly that leading to less humid or colder foraging or roosting areas, including potentially as a result of climate change.
Powerful owl	High-moderate: Powerful owls occur at low densities in most forest types in Victoria; the high number of records and abundance of prey species suggest the IPA supports more territories than average for an area of its size. There are over 30 records in or near the IPA covering most of the forest but especially between Mt Barranhet and Mt Strathbogrie. Two of these are confirmed breeding records (from near the southwest corner and Wilkinsons Tk in the north) but there are likely to be several breeding pairs distributed across the IPA. Map of records in and near the IPA provided in appendix 3.	<ul style="list-style-type: none"> • Reduction in large hollow-bearing trees for nesting and of forest cover generally. • Simplification and densification of open heterogenous forest structure suitable for foraging. • Reduced abundance of prey (forest mammals and birds) from habitat degradation by loss of larger or hollow-bearing trees or too frequent/intense fires.
Grey rice-flower	Very high: IPA supports substantial population at one of 15 locations in Victoria, along the inland foothills of the Dividing Range between the IPA and Corryong. Maps of records and the habitat distribution model provided in appendix 3.	<ul style="list-style-type: none"> • Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Brush-tailed phascogale	High: Although widespread in dry forests across central west, central and northeast Victoria, this species occurs at low densities and has disappeared from large areas of its former range (nearly all of Gippsland, for example), demonstrating the importance of sustaining populations across its remaining range. In the IPA, phascogales mostly occur near the edges, especially north from Too Rour. There are many records in the nearby roadsides, often as road kills and it may be that the IPA is providing a source population for a wider area. Maps of records and the habitat distribution model provided in appendix 3.	<ul style="list-style-type: none"> • Reduction in large hollow-bearing trees for nesting and of forest cover generally. • Simplification and densification of open heterogenous forest structure suitable for foraging. • Predation by foxes and cats • Reduced abundance of prey (mostly arboreal invertebrates) from habitat degradation through loss of larger trees, fallen timber or leaf litter as a result of firewood collection, timber harvesting, weed invasion or too frequent/intense fires.

Species name	Occurrence in and importance of the IPA	Threats
Tall leafy greenhood	Very high: IPA supports substantial population at one of only seven recorded sites in Victoria – near Eildon, Benambra and on the southern side of the Dividing Range.	<ul style="list-style-type: none"> • Poorly known but most likely potential threats are: • Disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil by: invasive herbivores and omnivores; vehicle and machinery traffic and churning; firewood collection; or too frequent/intense fires. • Weed invasion. • Grazing.
Murray spiny crayfish	High-moderate: Probably occur in many waterways in or near the IPA, even though they have been recorded in only four of them (Baddaginnie, Lima East, Brankeet and Hayfields Creeks). Have been recorded in most tributaries of the Murray east of the Hume Highway from the headwaters (up to 700 metres elevation) downstream but much less so where catchments have been extensively cleared such as inland of the Hume Highway and in the Strathbogrie Ranges southwest of Merton.	<ul style="list-style-type: none"> • Within the IPA: overfishing; predation by introduced fish, foxes, cats and pigs; sedimentation of waterways (from, for example, vehicular churn of authorised and other tracks, timber harvesting); and disease spread through (unauthorised) translocations. • Additionally, beyond the IPA but potentially with ramifications for populations there: agrichemicals; water regulation and weirs; water pollution; bank erosion; loss of riparian and in-stream vegetation and habitat such as rocks and logs.
Little eagle	Low: Occurs at low density across Australia where individuals range widely; no breeding or concentration of records or high-quality habitat in or near IPA – favours drier, more open and less mountainous forests than most of those in the IPA.	<ul style="list-style-type: none"> • Reduction of tree cover generally.
Hairy hop-bush	High: There are three records at two locations in the central part of the IPA – one of around 20 such populations scattered along the northern side of the Dividing Range and at a few places in Gippsland. Maps of records and the habitat distribution model provided in appendix 3.	<ul style="list-style-type: none"> • Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Glandular early nancy	High: There are two records at one site in the central part of the IPA and six records at two sites near the IPA. This population is one of around 15 scattered along the inland slopes and foothills of the Dividing Range between the IPA and Corryong.	<ul style="list-style-type: none"> • Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Square-tailed kite	Low: Occurs at low density in wooded landscapes around Australia where individuals range widely; no breeding or concentration of records or high-quality habitat in or near IPA – favours slightly drier, more open and less mountainous forests than most of those in the IPA.	<ul style="list-style-type: none"> • Reduction in large trees for nesting and of forest cover generally. • Reduced abundance of prey (forest birds, mammals and large invertebrates) from habitat degradation by invasive species; too frequent/intense fires; loss of larger or hollow-bearing trees, ground vegetation or fallen wood; or surface soil disturbance.
Euroa guinea-flower	Very high: Although most of the 14 known populations are on roadsides around Euroa and Longwood, the largest known population is in the IPA near Warrenbayne.	<ul style="list-style-type: none"> • Although further research is required, firewood collection and habitat fragmentation from walking tracks are known threats at the IPA site. • Potential threats include the grazing of stock and infection by the pathogen Cinnamon Fungus.
Wine-lipped spider-orchid	Moderate: Mostly known from the foothills immediately east of Melbourne, but in patches from the Grampians to as far east as Yarram. The record in the IPA of a single plant, and another near Highlands (both from 1998) are the only ones in northeast Victoria so the viability of the species in this region is uncertain.	<ul style="list-style-type: none"> • Poorly known in the context of the IPA but of the threats listed for other populations the most applicable are weed invasion, grazing, soil disturbance and vegetation clearance.

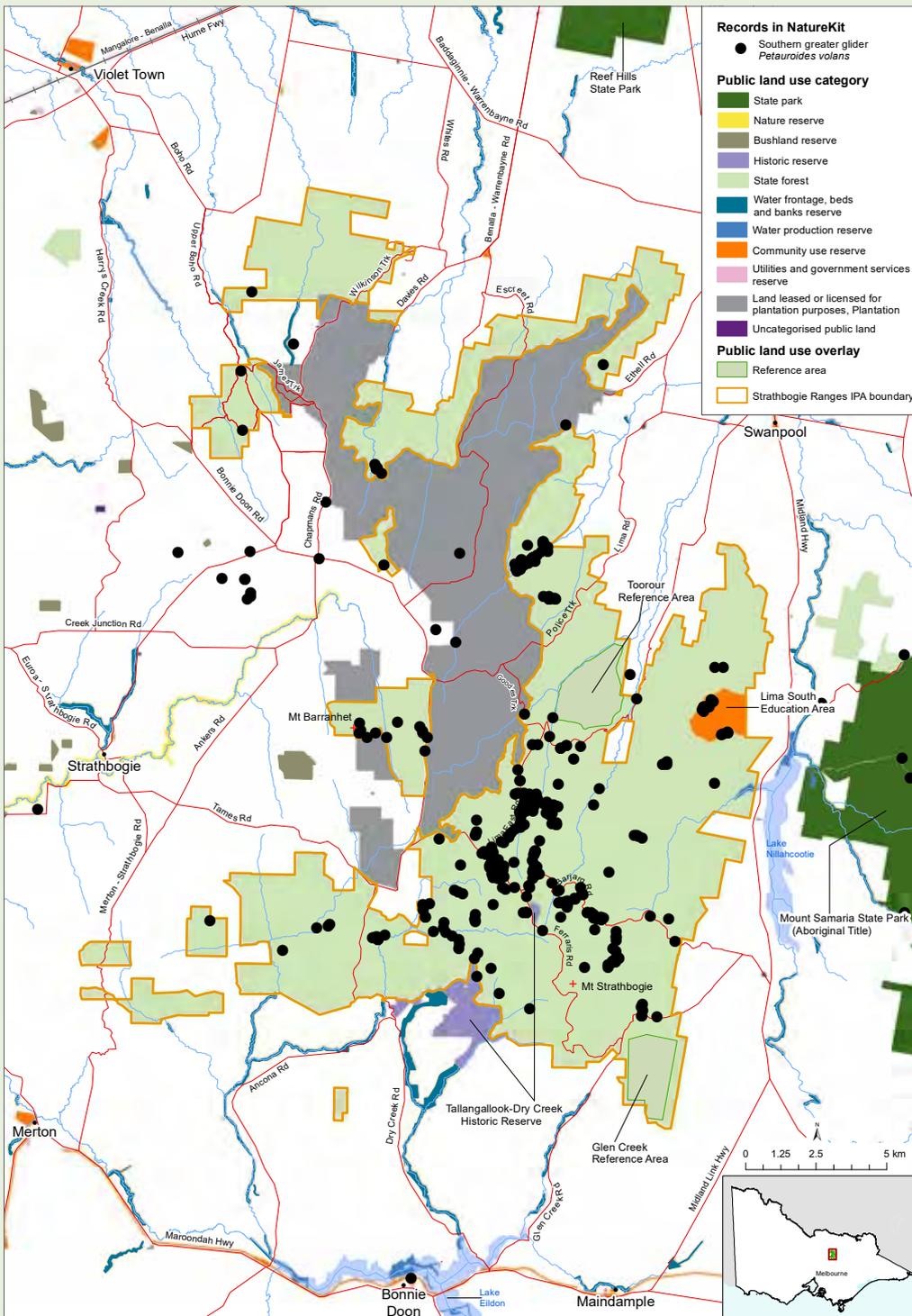
Species name	Occurrence in and importance of the IPA	Threats
Cupped bush-pea	High: As with all but 2 records in the Strathbogies, the sole record in the IPA is old and the persistence of this species in the IPA requires verification. This Strathbogies population is one of five in Victoria between the Strathbogies, Glenmaggie and Corryong.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Austral moonwort	High-Moderate: There is only one old (1924) record in the northern part of the IPA – one of many places with old but not recent records of this species. In total, there are around 70 records in Victoria from around 20 sites so the IPA would be a reasonably important site for this species if it still occurs there.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Highland bush-pea	High-Moderate: There is only one record in the IPA and an old record near Mt Wombat – its occurrence in the area may be as a peripheral part of the population in nearby Mt Samaria State Park where there are at least six records. This population is one of less than ten in Victoria between the Strathbogies and Corryong.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Tiny daisy	High-Moderate: Record in the IPA is old (1901) but there are recent records near Highlands, Boho South and southeast of Tatong. The only other Victorian records are near Beechworth, Mt Buffalo, and at three sites near Corryong. So there is a reasonable chance this species occurs in the IPA, in which case the area would be important for its conservation.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Large-leaf cinnamon-wattle	Moderate: A single record in the IPA is about 50 kilometres northeast of the nearest edge of the main Victorian population in the hills northeast of Melbourne where there are hundreds of records in many locations.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, leaf litter, soil crusts or surface soil.
Macquarie perch	Low: There are six records from the 1970s of Macquarie Perch in Lake Nillahcootie close to the IPA, and near the Broken River north of Swanpool. There are also many records in Seven Creeks downstream of Strathbogie township the IPA (~20 kilometres downstream of the IPA). Macquarie Perch have been widely recorded in the upper and middle reaches (mostly) of Murray River tributaries east of the Loddon River and in other waterways to which they have been introduced.	<ul style="list-style-type: none"> Threats originating within the IPA are most likely to have greatest impact downstream where most of the population occurs. Documented threats applicable in the IPA are: waterway siltation; damage to riparian vegetation; drought, recreational fishing; and competition with, and predation and in-stream habitat degradation by exotic fish.
Lima stringybark	Low: Entire population (estimated at 1,500 trees) occurs within 8 kilometres of northeast boundary of IPA, including some sites within tens of metres of the boundary, but no records actually inside the IPA. In addition, the IPA has very little suitable habitat for re-establishment.	<ul style="list-style-type: none"> Mostly associated with agricultural use on private land at sites of occurrence or adjacent to public land roadside sites: stock grazing (including ringbarking); soil compaction; weed invasion; fertilisers and pesticides; slashing and grading of roadsides for fire management.
Southern pygmy perch	Low: There are many records in Baddaginnie and Lima East Creeks near the IPA. The headwaters of both catchments are largely contained in the IPA as are those of Seven Creeks where there are many records from ~20 kilometres downstream of the IPA. There are also records in the Broken River near the IPA. This taxon is widely recorded in the middle reaches (mostly) of Murray River tributaries east of the Avoca River but mostly east from the Goulburn River.	<ul style="list-style-type: none"> Threats originating within the IPA are most likely to have greatest impact downstream where most of the population occurs. Suspected threats documented for this taxon include the removal of riparian and aquatic vegetation; loss connectivity between rivers and floodplains; sedimentation of water bodies; and competition with, and predation and in-stream habitat degradation by exotic fish.

Species name	Occurrence in and importance of the IPA	Threats
Late-flower flax-lily	Moderate: Although there are records of this critically endangered species close to the IPA, these are in the species' typical habitat on the lower slopes or near gullies of the flatter, drier and lower landscapes surrounding the IPA. Late-flower flax-lilies may occur just within the IPA boundary peripheral to this typical habitat, in which case the IPA would become important for its conservation depending on the extent of its occurrence in the IPA.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Mountain Swainson-pea	Low: There is only one old (1935) record near the northern part of the IPA. The last known wild individuals of this species in Victoria died in 2012 – if it was found again in the IPA it would be extremely important for the conservation of this species.	<ul style="list-style-type: none"> Agricultural developments such as pasture improvement, grazing, competition from weeds, reduced fire frequency, physical disturbance of sites such as for road works.
Cottony cassinia	Moderate-low: A single record near the southwest boundary of the IPA from 1903 but there is record at Mount Wombat (~10 kilometres west of IPA) from 1989; cluster of records Avenel-Longwood East; ~10 other clusters Inglewood-Corryong. Endemic to Victoria.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Bear's-ear	High-moderate: Single record (2013) near the IPA; there are more than 70 records from at least 30 locations scattered across almost the whole of Victoria.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Fir clubmoss	Low: Single record in the IPA (1989); virtually all other of the 85 records (in at least 17 locations) in Victoria are at high alpine locations.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are desiccation, weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, soil crusts or surface soil.
Eastern bitter-cress	High-moderate: Single record (2008) just west of the IPA. In total, ~25 records in Victoria at ~15 locations mostly upper Murray and Mitta Mitta, and scattered in Gippsland east of Maffra. Mostly occurs near streams and lagoons	<ul style="list-style-type: none"> Poorly known but most likely potential threats are desiccation, weed invasion; browsing and trampling by stock; altered hydrological regimes; sedimentation of habitat (from, for example, vehicular churn of authorised and other tracks); damage by off-road vehicles.
Broom scale-rush	High: Two records just west of the IPA are part of only population (with Mt Samaria) in Victoria outside East Gippsland where mostly east of Cann River; in Victoria ~44 records, ~6 populations	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing and trampling by stock; too frequent/intense fires; damage by off-road vehicles; altered hydrological regimes; sedimentation of habitat (from, for example, vehicular churn of authorised and other tracks); and disturbance to or loss of ground cover vegetation, fallen timber, leaf litter, or surface soil.
Bent-leaf wattle	Moderate: One record near the IPA but another two not far away. Many populations, spread across most of the box-ironbark country roughly between Charlton and Wangaratta.	<ul style="list-style-type: none"> Poorly known but most likely potential threats are weed invasion; browsing; too frequent/intense fires; damage by off-road vehicles; and disturbance to or loss of ground cover vegetation, leaf litter, soil crusts or surface soil.

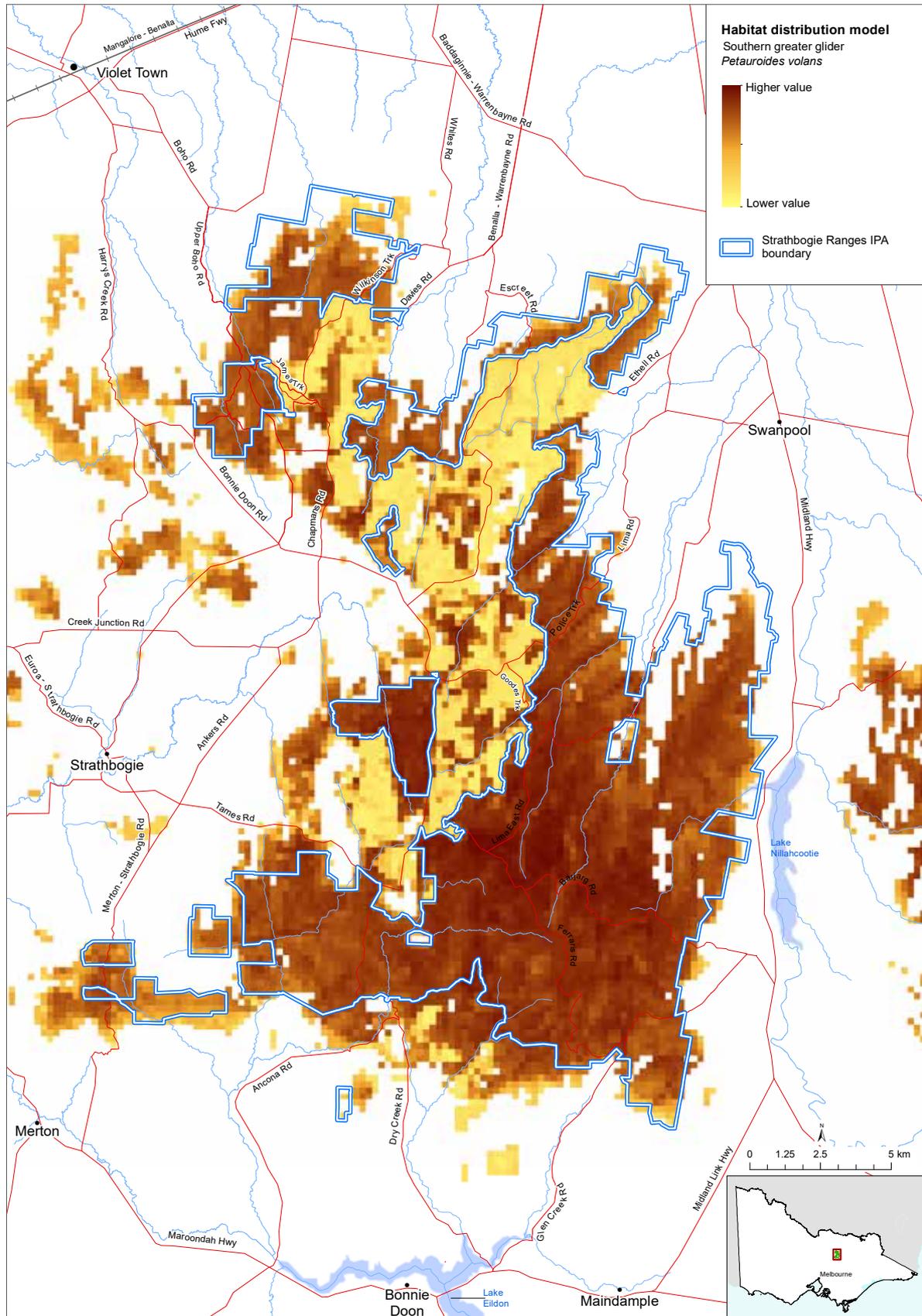


Threatened species records and habitat distribution models

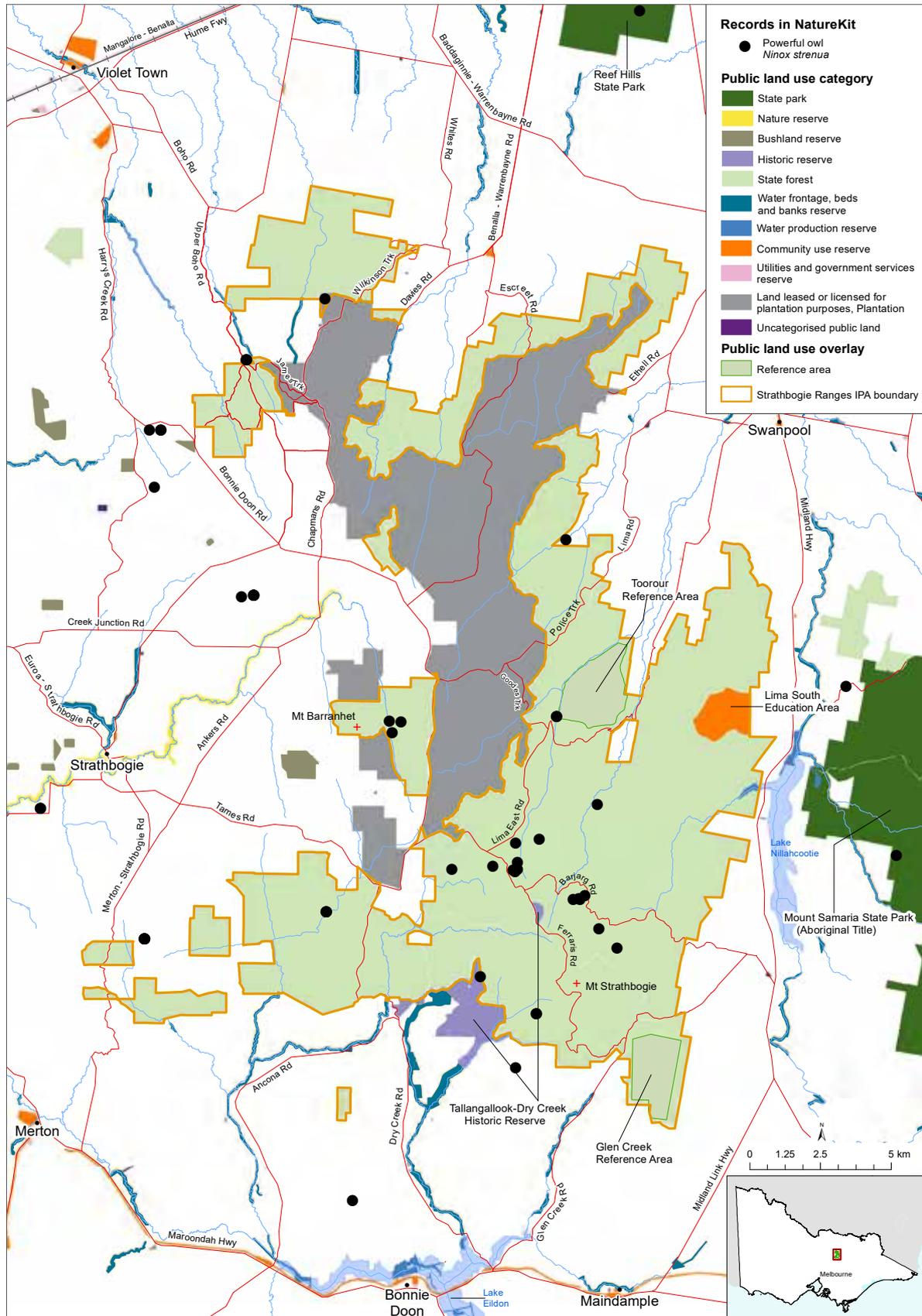
A1 Southern greater glider records (source: Victorian Biodiversity Atlas)



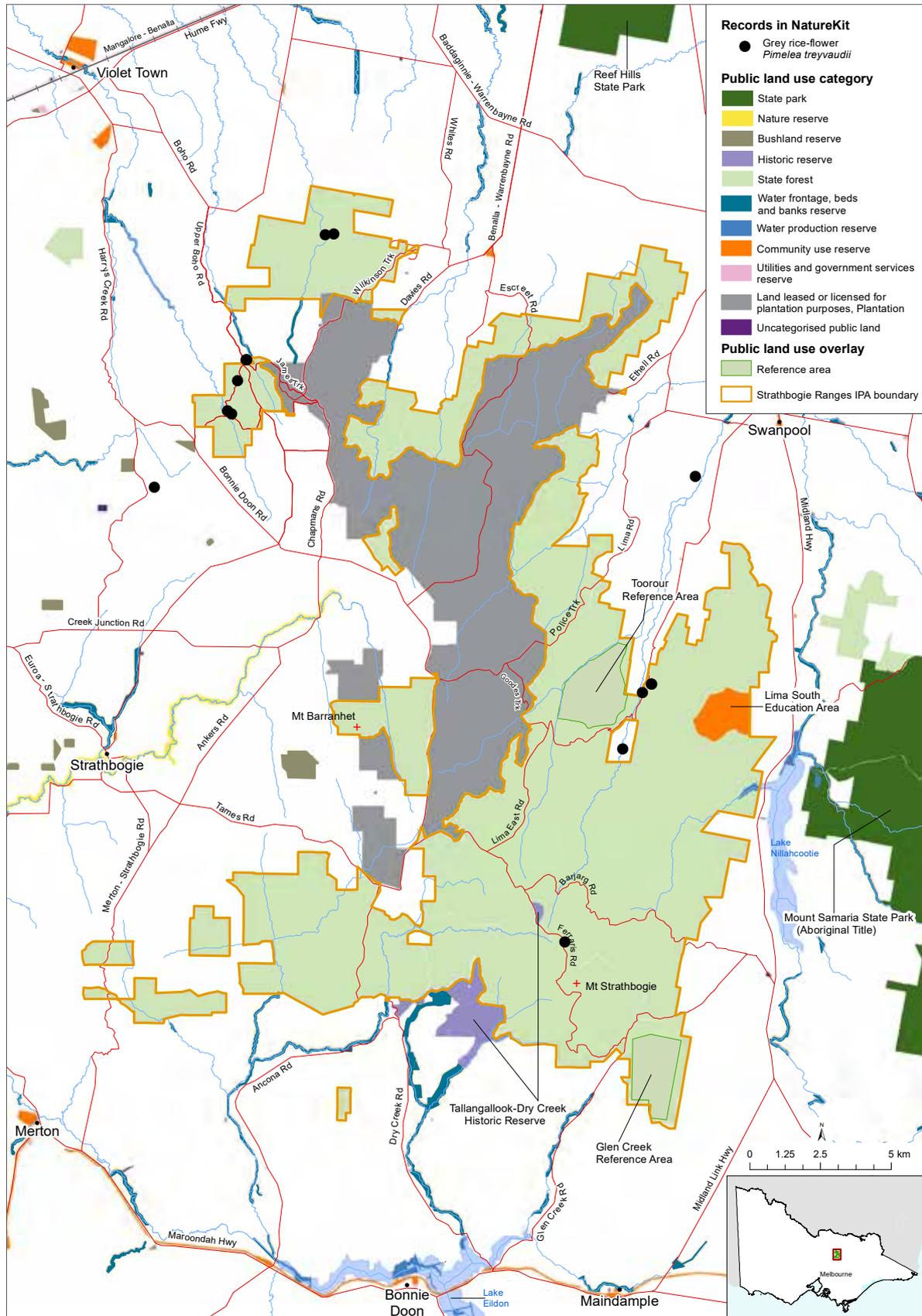
A2 Southern greater glider habitat distribution model



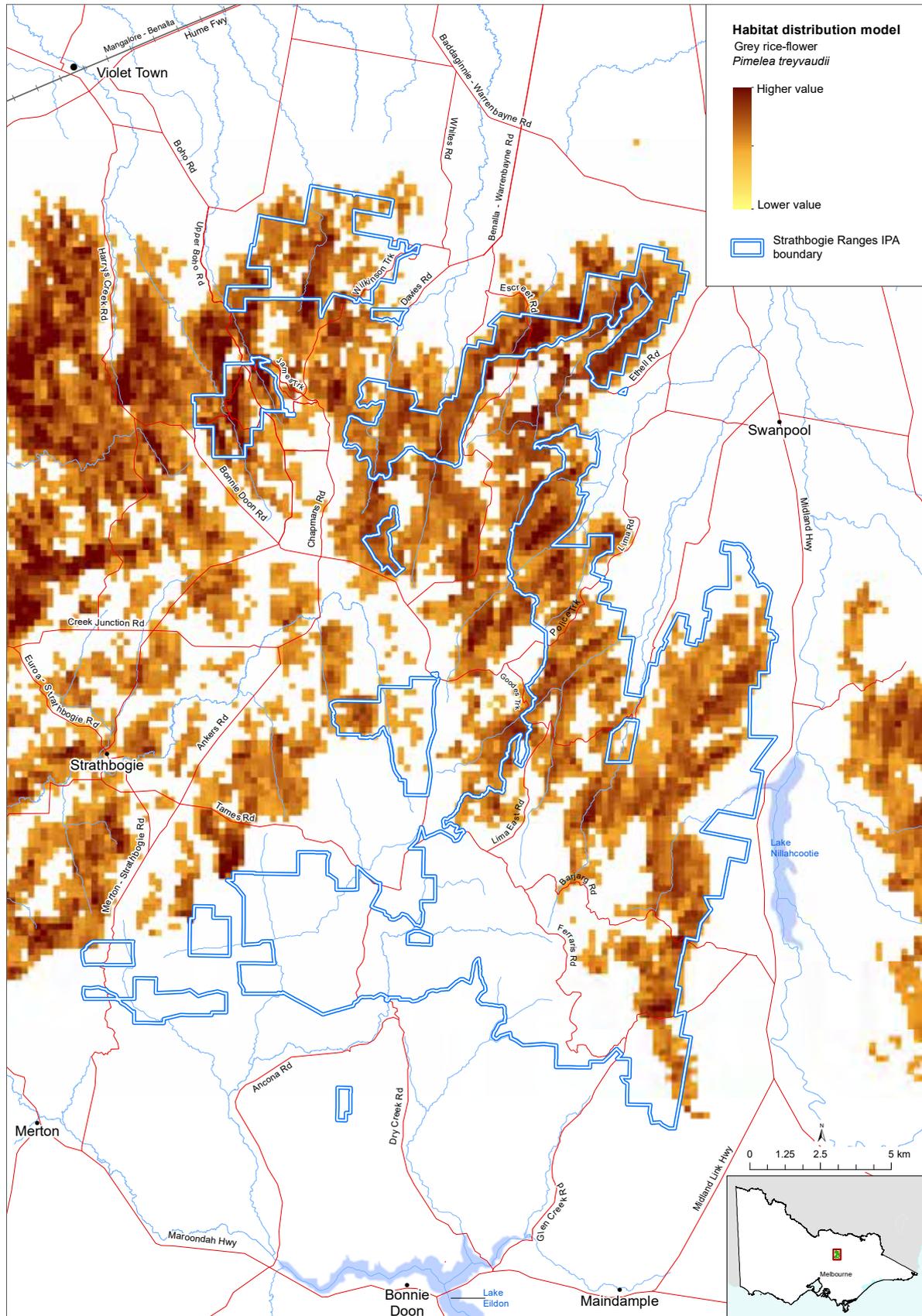
A3 Powerful owl records (source: Victorian Biodiversity Atlas)



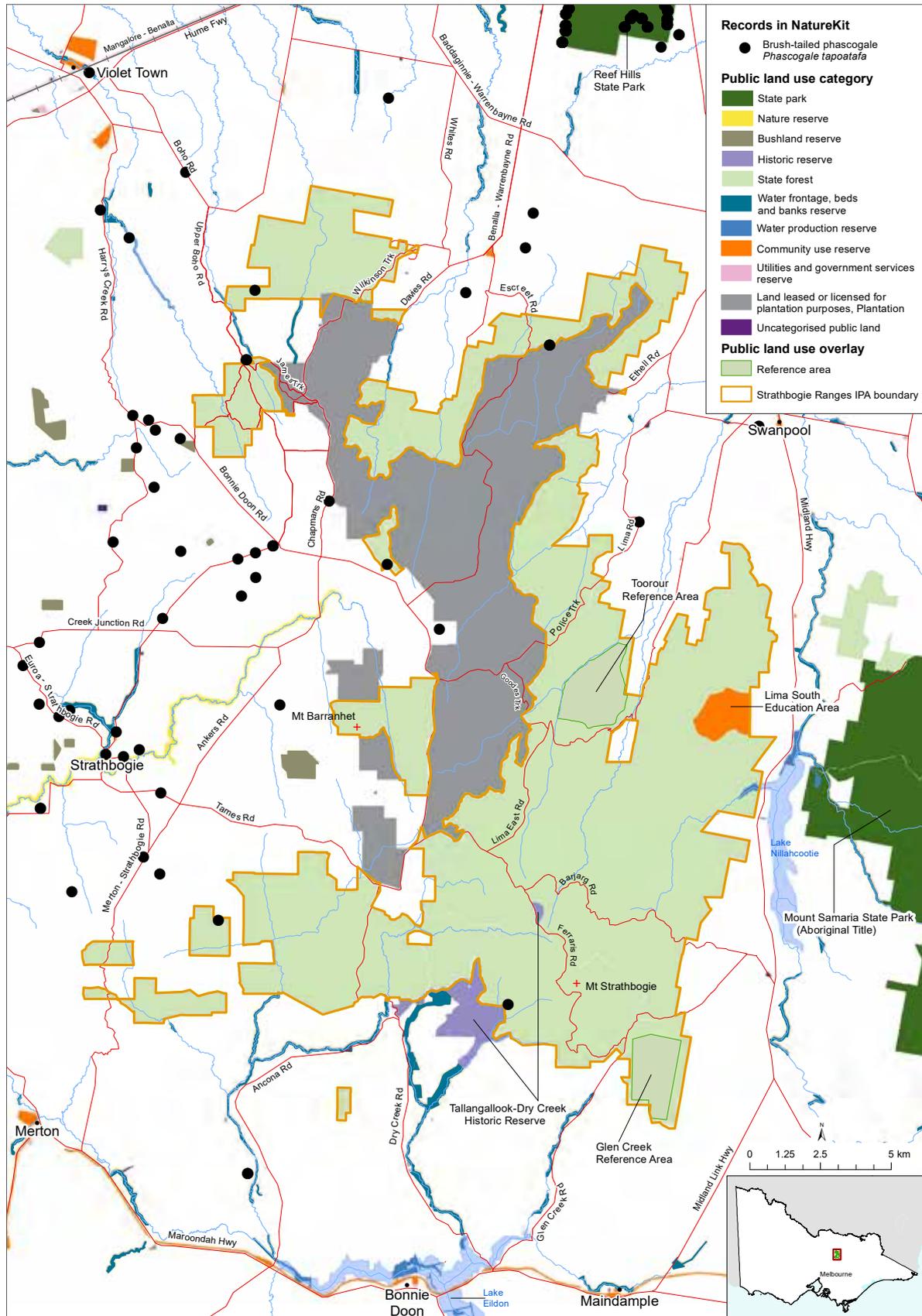
A4 Grey rice-flower records (source: Victorian Biodiversity Atlas)



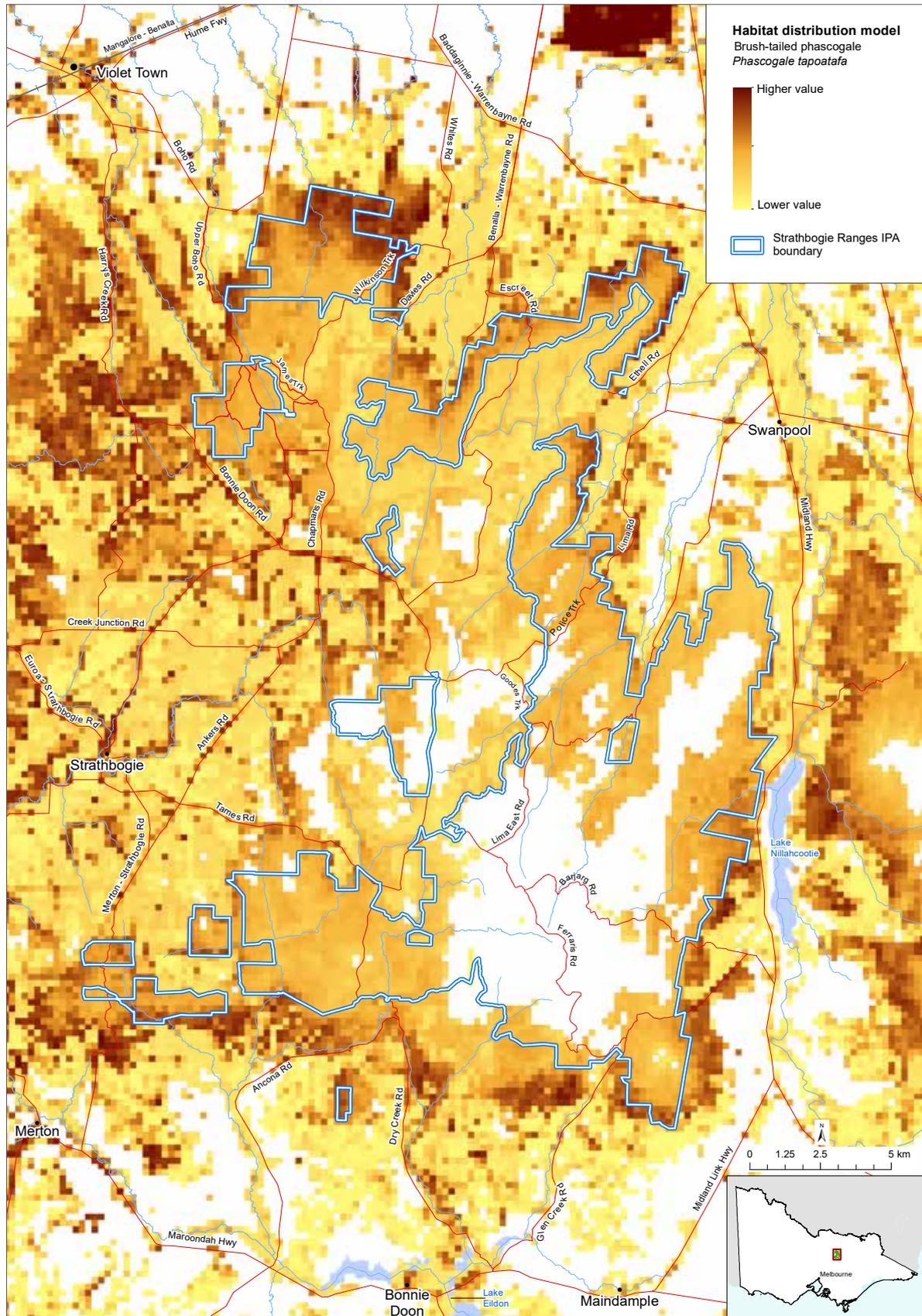
A5 Grey rice-flower habitat distribution model



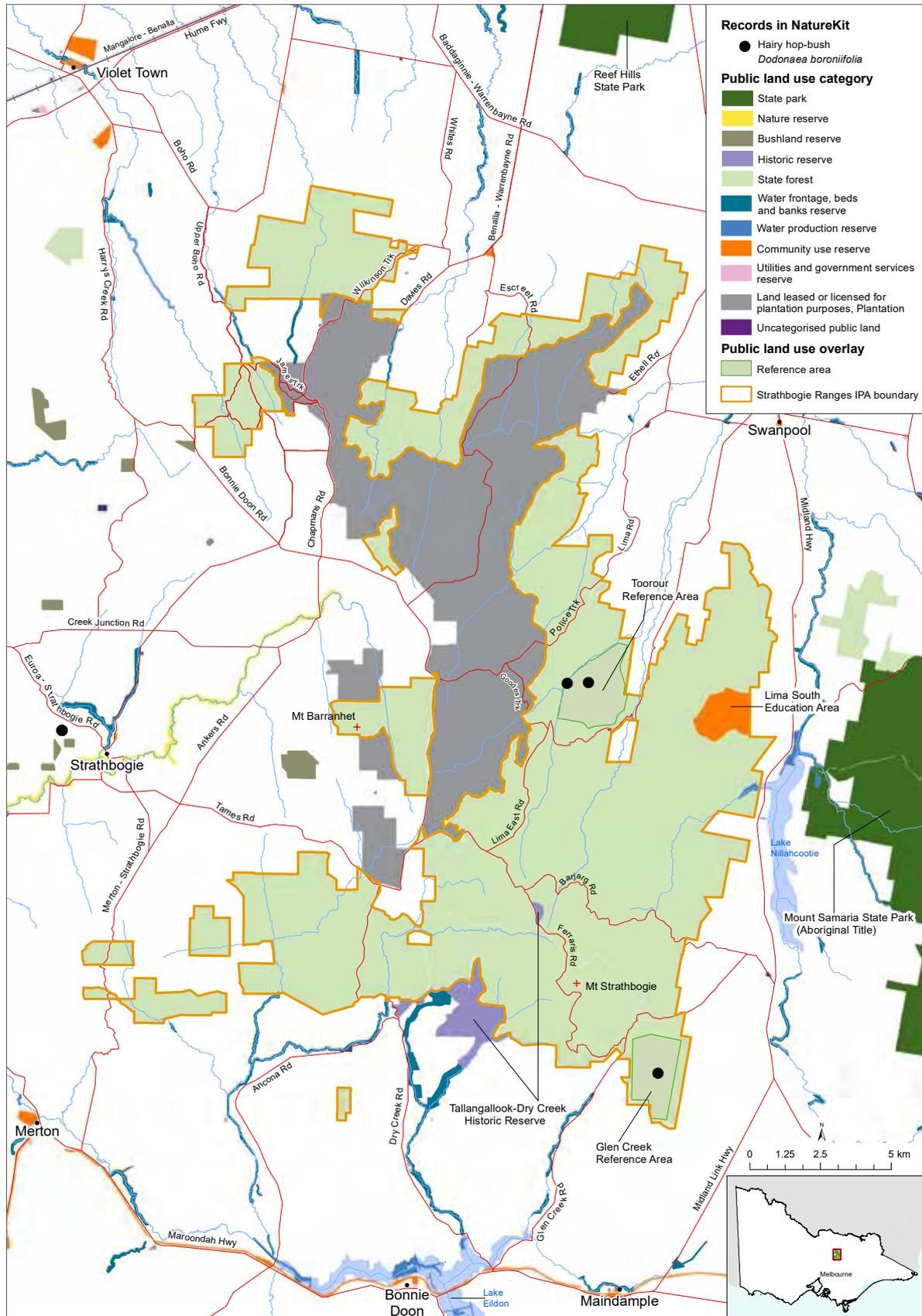
A6 Brush-tailed phascogale records (source: Victorian Biodiversity Atlas)



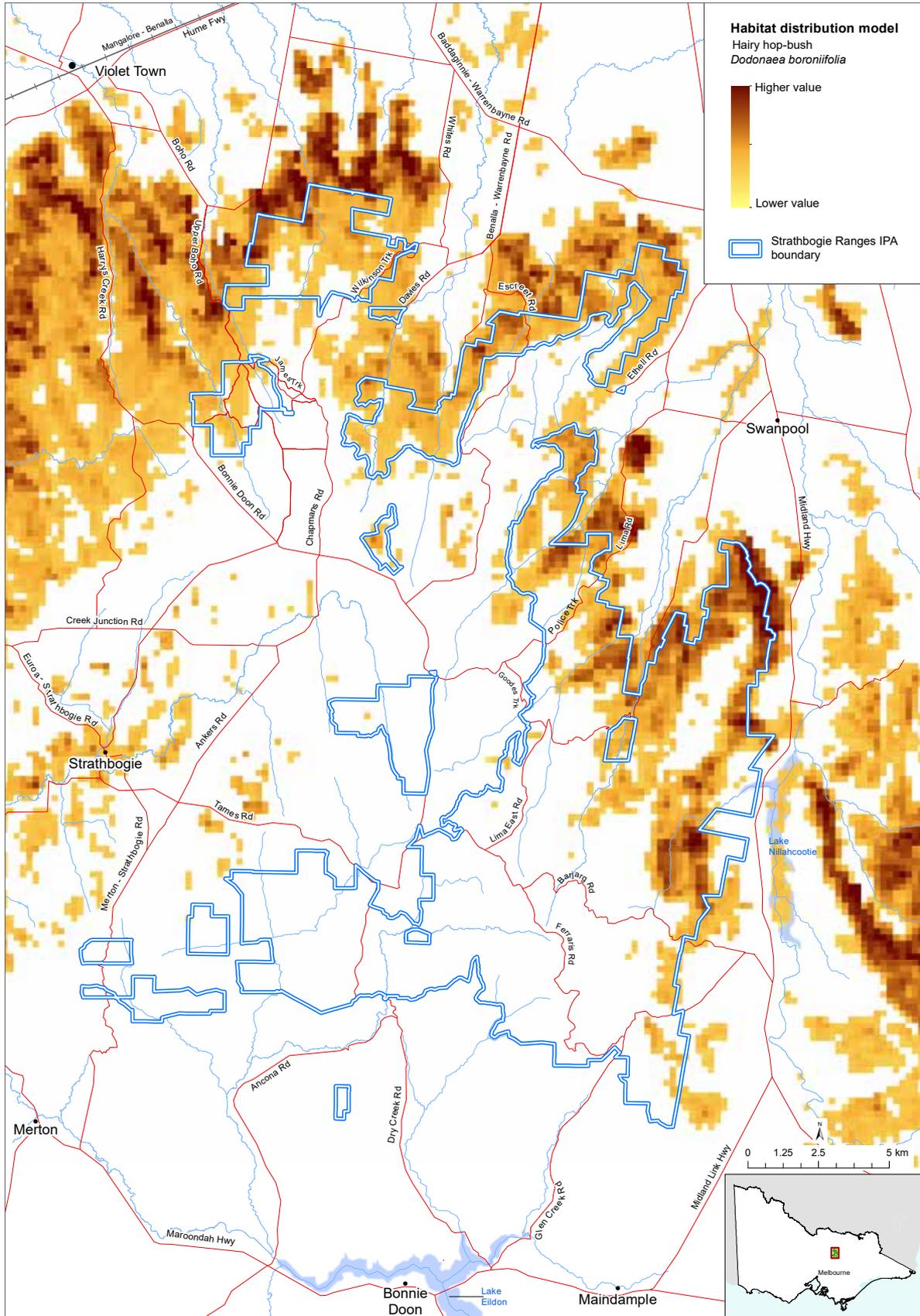
A7 Brush-tailed phascogale habitat distribution model



A8 Hairy hop-bush records (source: Victorian Biodiversity Atlas)



A9 Hairy hop-bush habitat distribution model



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