VNPA Submission

Central West Investigation: Draft Proposal Paper

9 December 2018
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Summary

The VNPA welcome the Central West Investigation and reassessment of public land in the area, and commend VEAC on their consultation process. We are pleased to provide our second submission to this VEAC process. This submission builds on VNPAs previous submission from August 2017, which discusses the unique values of the areas in detail. This submission builds on this information and responds to the VEAC draft recommendations.

The draft recommendations include almost 50,000 hectares of new national parks, over 18,000 hectares of new regional parks, and over 11,000 hectares of new conservation, nature and bushland reserves across the central west investigation area. VNPA supports these much needed parks to protect our threatened species, habitats and communities.

These new parks will also be a plus for tourism, recreation and nature conservation in Victoria’s central west. Many popular recreational values and uses such as camping, bushwalking, biking, and 4x4 driving will be protected from threats such as intensive logging, future mining and other inappropriate uses.

These special places are all worthy of better protection, and VEAC’s draft recommendations would fill the significant gaps in Victoria’s conservation estate. It is an important step towards delivering on broader international, national and state-wide conservation objectives and commitments, particularly those identified in the Protecting Victoria’s Environment – Biodiversity 2037, especially priority 18: Maintain and enhance a world-class system of protected areas.

National Parks are popular with recent state-wide polling showing high level of public support for national park and new central west, with 70.4% of people support new parks in central west Victoria around Daylesford, Woodend, Bendigo and west of Ballarat.

The native forest industry is a minor industry and in decline across the investigation area, while the tourism industry is growing as an employer. Parks are a popular drawcard and are, can be a key attractor for visitors. Due to the relatively close proximity of the investigation area to a growing Melbourne, prioritising existing walking infrastructure and development of short walks as well as other park establishment programs such as signage, active land management in partnership with indigenous owners, and good promotion and marketing would help expand the levels of regional visitation and employment, while conserving the unique natural features of the area.
The proposed national parks should be given protection under the *National Parks Act 1975*, and in addition, the proposed regional parks should have the requirement of:

- A well-resourced management and ecological restoration plan created to deal with the impacts of historical logging, pest plant and animals, and climate change;
- A management plan for each park to manage allowable uses and avoid conflict, and include a long-term strategy for domestic firewood collection.

Of major concern is the lack of protection recommended to be afforded to Mount Cole, despite its important natural and recreational values. Much of the area is set to be left open to intensive logging. We believe Mount Cole is worthy of stronger protection.

Stronger protection of Mount Cole in a national park under the *National parks Act 1975* is needed – either fully protected as a national park, or in a multi-tenure system with an increase in area under a national park and an adjoining regional park. This would allow for more uniform management, and the protection of Mount Cole’s values against the threats of intensive logging and other potential impacts.

Significant values of Mount Cole include:

- **Headwaters of the Wimmera River** if protected could improve stream condition further downstream;
- **Mount Cole Grevillea** is extremely rare and declining in its highly restricted distribution in the Mount Cole area;
- **Victoria’s popular Beeripmo Walk** where surrounding areas are currently and scheduled to be logged;
- **Montane Plateau vegetation type** will be critical in acting as an important climate change refuge for species movement and survival;
- **Herb-rich Foothill Forest vegetation type** that if protected would reduce its shortfall by more than a third within the Central Victorian Uplands Bioregion;
- **Special Protection Zones (SPZ)** currently spread across many areas of Mount Cole should exclude logging activities to protect habitat, for example for Powerful Owl.

Additionally, Mount Cole rises almost 1,000 meters from a relatively flat plain, making it an important climate change refuge for species movement and survival, and has among the highest condition of native vegetation in the area. Stronger protection for Mount Cole will be critical looking ahead. At a minimum the Wimmera River headwaters should be listed as a Heritage River and protected under the *Heritage Rivers Act 1992*, to be consistent with similar listings further downstream.
Overall, with the exception of Mount Cole, the recommendations provide for a balanced use and appropriate management to conserve and enhance the natural and cultural values of the area. Community support for these new parks is strong, and Victoria will need more parks now and into the future to meet demand of our growing population to enjoy the outdoors, and as critical safe havens for the conservation of our threatened natural species, habitats and communities.

**1.0 Context**

**1.1 Central West proposals and International & National Policy Targets**

The Central West Investigation Draft Proposal Paper – for public comment, VEAC August 2018, is an important step towards delivering on broader international, national and state-wide conservation objectives and commitments.

Under 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 processes incorporate the broad requirement for a comprehensive, adequate and representative protected area system. This is commonly referred to as the ‘CAR’ system. The CAR criteria set targets at the ecosystem level, for terrestrial areas in Victoria, known as Ecological Vegetation Classes (EVC). A number of national targets have been set in agreements between the Commonwealth and state/territory governments to help establish a comprehensive, adequate and representative terrestrial reserve system. The first of these were developed in 1996 for forests, and are widely known as the JANIS criteria. The JANIS definitions of endangered, vulnerable and rare ecosystems align closely with the definitions for the bioregional conservation status of EVCs in Victoria, though new information and some of the international settings have moved on since the 1990’s.

The national policy framework for building the NRS was updated in 2009-2030. Endorsed by state government including Victoria, through the Natural Resource Management Ministerial Council May 2009. This strategy identifies priority actions to provide a nationally coordinated approach, including the following national targets for a national reserve system:

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

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

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

In summary, there has been a trend from relatively specific targets towards those that are less well defined i.e. from numerical targets applying to ecosystems in Australian forests (JANIS targets) to ‘well-connected’ protected areas applying to bioregions across the globe (Aichi targets). As noted in the VEAC public Land discussion paper, while the current expression of targets has merit, in that it explicitly acknowledges the need for connectivity and integration into the wider landscape, there is also a need for the broader targets to be translated to concrete and specific targets for their application.²

The draft proposals presented are generally in line with these targets, but based on the reserve designs in the draft report, there are still shortfall in some vegetation types, and further work is needed to consider some of the more sublime issue to do with ensuring there is critical core areas for climate resilience, such as specified in the National Reserve System Strategy.

1.2 Central West Proposals and Victoria Biodiversity & Conservation Policy


The Hon. Lily D’Ambrosio MP, Minister for Energy, Environment and Climate Change states in the forward:

“Our natural environment is not only beautiful, it is fundamental to the health and wellbeing of every Victorian. It provides clean air and water, productive soils, natural pest control, pollination, flood mitigation and carbon sequestration – and supports productive activities that underpin our state’s liveability and economic advantage.

“..recognising that our long term wellbeing and prosperity is inextricably linked to the health of our natural environment. This is not just a plan for action, but a blueprint for our success in stopping the decline of Victoria’s unique biodiversity.”

These are sentiments we whole heartily support. We also note that this government strategy recognised the value of national parks and importantly the role of VEAC assessments. The plans states:

“Permanently protected habitats on public and private land and waters – in national parks, conservation reserves and Indigenous protected areas, and under covenants – form the backbone of biodiversity conservation. To maintain and improve biodiversity, the extent and condition of these permanently protected areas need to be enhanced.” (Page 48)

“In implementing this Plan, the government will give due recognition to the increased importance of the Victorian Environmental Assessment Council in regularly reviewing the extent and adequacy of the terrestrial reserve system in the context of a changing climate, habitat shifts and decisions about appropriate land uses.” (Page 48)

The plan also acknowledges that there are still significant gaps in representative of Victoria’s national park and conservation estate. “The estimated gap in additional protected areas required to meet Australia’s criteria for a comprehensive, adequate and representative reserve system is 2.1 million hectares.” (Page 49). One of the key gaps in the bioregion which are current being assessed in the Central West Investigation.

The plan states, maintenance and improvement of Victoria’s system of protected areas requires the following components:

• A comprehensive, adequate and representative protected area system across public land, private land and Indigenous protected areas that continues to be the cornerstone of conserving biodiversity.
• Management of other public land and waters to also deliver biodiversity conservation which, in turn, will complement the reserve system.

Priority 18 of the plan recognises the key role of parks, which is too “Maintain and enhance a world-class system of protected areas. Initiatives by the government to deliver this priority will include:

• Review the extent, representativeness and adequacy of the reserve system to identify key gaps and additional complementary measures required to improve the reserve system on public and private land;
• Identify future reserve system priorities (such as targeted acquisition) through strategic land-use planning;
• To ensure that Victoria’s reserve system on public and private land is as effective as possible, formally protected areas need to be well managed and well connected. ³

The draft proposals, will help us deliver on priorities identified in the Protecting Victoria’s Environment – Biodiversity 2037, especially priority 18 Maintain and enhance a world-class system of protected areas.

1.3 Community Interest and Assessment in the Investigation Area

There has been long running community interest in the conservation value of the forests in Central West Investigation area. The draft proposals, largely recognise many of the values identified in these reports for Wombat, Pyrenees and Wellsford forests. Mt Cole and surrounds are an exception, which there are still gaps.

In 2010 the VNPA released the Better protection for special places report, which identified 20 state forests in the central west of the state, including the Wombat (near Daylesford), Wellsford (north-east of Bendigo), Mt Cole (west of Ballarat) and Pyrenees (north-west of Ballarat) as in need of better protection and management.⁴

Conservation Values of the Mount Cole and Pyrenees Landscape: An Assessment by the Wilderness Society, Ballarat Environment Network, Wombat Forestcare and Bendigo and District Environment Council in 2010, also provides detailed overview of values on both private and public land. ⁵

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The report *Conservation Values of the Wombat Forest and Macedon Region*, by Wombat Forestcare, 2017, also provides and comprehensive assessment of the values on both private and public land, in this part of the investigation area.\(^6\)

Our most recent 2017 analysis shows VicForests new logging plans for western Victoria will target areas known to contain high numbers of threatened species and large areas of endangered, vulnerable or depleted native vegetation types. This is covered in the report *Western Forests and Woodlands at Risk*.\(^7\) As part of this report, a basic analysis of vegetation significance, threatened species records from the VBA, and coupe locations was provided, in addition to a discussion of the relevant strategic issues.

Further work investigation including site visits to Mt Cole and these issue are discussed in detail in Section 2.2 & 2.3 of this submission.


2.0 VNPA Key Issues

2.1 Community Support for National Parks and Citizen Science

2.1.1 Community Attitudes to National Parks – Polling
Conservation of nature and national parks are well supported across the wider community, including proposal for new parks in the Central West. A recent state wide poll of 1500 people conducted by the VNPA on the 13 of November, 2018 found:

1. **National Parks**: 72.7% support Victoria having a comprehensive network of National Parks and conservation reserves across land and sea (36.5% strongly support, 36.2% support);

2. **Funding for Nature**: 72.8% support increasing funding and more government action for protection of nature, including threatened species and national park management across Victoria (37.6% strongly support, 35.2% support);

3. **Logging in State forest**: Only 9.6% of people supported logging in state forests, while 71.6% supported protection of wildlife & nature and recreation;

4. **New parks Central West**: 70.4% of people support new parks in central west Victoria around Daylesford, Woodend, Bendigo and west of Ballarat (Strongly support 34.8% and 35.6% support).

Full results can be found at [https://vnpa.org.au/victorian-polling-results/](https://vnpa.org.au/victorian-polling-results/) and are consistent with earlier polls.

2.1.2 Caught on Camera – Citizen Science and mammal populations of wombat forest
Between 2012 and 2016 more than 200 volunteers contributed over 2,500 hours to monitor wildlife in Wombat State Forest as part of the Caught on Camera project. Thanks to the inspiring volunteer effort, the community amassed five years of data on 13 native mammals and 15 native birds, including threatened species. This is part of a 10 year project and this report marks our findings at the half way mark. Caught on Camera has been a major achievement for the local and wider community. Through the project, we’ve built and strengthened positive and long-lasting links between the community, scientists and the government. The community came together to develop and deliver this project over the past five years, with volunteers from Wombat Forestcare and VNPA being involved in.

Five years of records that document 13 native mammal species (including the threatened Brush-tailed Phascogale (*Phascogale tapoatafa*) and 15 native bird species, we have also recorded nine introduced mammal species and one introduced bird species. Other recent studies in similar ecosystems have shown that longer-term effects of fire on flora and fauna are generally more subtle than those in the first three years. Our project appears to support this, at least for the common species. So far, there is no evidence of a dramatic response for any species, and several species have shown only subtle responses (a copy of the Final Draft of the report is attached in Appendix II).
Altogether we recorded 23 mammal species and 16 bird species with the motion-sensing cameras. Black Wallabies were detected on all 44 sites and were recorded on more days than any other species. In terms of numbers of sites recorded, the next most common mammal species in descending order were Common Wombat (36 sites), Agile Antechinus (31), Red Fox (28), Mountain Brushtail Possum (26), Eastern Grey Kangaroo (22), and Bush Rat (18). All were native except for the Red Fox.

The same seven species also topped the list in terms of numbers of days detected, accounting for 74.2% of mammal site-days. The two small species in the group (Agile Antechinus and Bush Rat) were recorded on more days at each site than the larger species, reflecting their small home ranges and consequently higher density.

No other mammal species was recorded on more than 10 sites (see Table 2). Black Rats appeared to be common on one of the three sites where they were recorded (WCR8, with Forby Forest last burnt in 2004) whereas other species were detected infrequently.

The species recorded were mainly ground-foragers, although Agile Antechinus also forage extensively in trees and five species feed mainly in trees (Brush-tailed Phascogale, Koala and the three possum species). No gliders or bats were recorded with the camera traps.

Of the 22 mammal species, 13 were native and nine were introduced to Australia. Introduced mammal species contributed 7.1% of the mammal site-days, showing that introduced mammals form only a modest component of the mammal fauna detected. The most commonly detected bird species was the Superb Fairy-wren, and it was found on 20 sites, followed by the Grey Shrike-thrush at 18 sites.

Three of the uncommon Native mammal species recorded were only found in Foothills Forest: these were Brush-tailed Phascogale, Swamp Rat and Dusky Antechinus. Fewer birds were recorded in the two sites containing Grassy/Heathy Dry Forest than in sites containing Forby Forest or Foothills Forest.
2.1.3 Indigenous views and consultation

VNPA acknowledges and supports the aspirations of the indigenous groups including, joint management planning, as a fundamental and necessary way to manage parks. Joint management has been critical in other parts of the state and could provide benefits strategically for landscape improvements with many Traditional Owners involved.

The following statements, from VEAC’s Aboriginal Community Engagement report, May 2018, are important and we concur with many of the issues identified including:

Mount Cole-Pyrenees block

The area is a significant area for the watersheds and connection to neighbouring cultural groups.

Don’t want mineral exploration, mining or logging.

Also identified is the extremely poor condition of the head waters and the upper catchment area is poorly managed.

Extremely poor condition of the head waters and this as an area of upper catchment poorly managed.

Want to be respected and resourced to undertake Land Management activities. Have begun re-negotiations with the State under the Traditional Owner Settlement Agreement Act 2010, as currently have a Native Title determination for part of their defined lands. There are important small reserves that are patches of remnant vegetation that provide a snapshot of how country looked prior to white settlement and clearing. They hold rare and threatened species, provide habitat to native animals and are a source of seed to be able to restore surrounding Country with appropriate plant genetics.

If classifications move towards Parks seen as opportunity for alignment with negotiations with the State upon TOSA matters.

Mount Macedon – Wombat

The area is a significant area for the watersheds and connection to neighbouring cultural groups. Significantly, strengthening the protection of the area as it is very significant.

Overall Country in average condition, but isolated areas of values. Generally, a preference for more protective classifications to limit major impacts such as logging and mining.
Generally, a preference for more protective classifications to limit major impacts such as logging and mining.

Wellsford

Because of its current classification there is concern to ongoing timber harvesting.

Average condition, understanding since contact that a great degree of landscape modification has taken place, most notably gold mining. Area requires the group’s involvement in all landscape management aspects.

Support for RSA and the Country Plan, “Dhelkunya Dja”. Greater resourcing for the group to undertake independently or as a lead for any projects if resourced. Potential with re-classification to be included into the groups Joint Management Plan (Greater Bendigo National Park) Alignment with areas Regional Park or as a Nature Conservation Reserve are also seen as suitable options.

Overall Conclusions:

- Health of head waters was viewed as poor and needed to be improved for country health and upper catchment productivity.
- Learning and building capacity of groups. Country plan or similar document provide relevant information for landscape/country management.
- Resource support by the State to manage Country was lacking.
- TO groups did not want mining to be altering and damaging country.
- Special plants, for food, fibre and ceremonies was present but not always abundant e.g. for smoking ceremonies.
- Grouping land classifications is useful and practical, statuses of Parks and Reserves provide Joint Management and Aboriginal Title opportunities.
2.2 Timber Industry Decline and Transition Opportunities

2.2.1 Timber Industry Decline

It is clear from VicForests recently released report, that the Timber industry is a small and declining part of the regional economy in the investigation area.

Total employment in the investigation area (Avoca census area, see Table 8) by VicForests Contractors and Customers and secondary processing, is 21 FTEs (16 direct and 5 secondary processing). (Table 8, page 22).\(^8\) What this report fails to mentions is the significant level of state subsidy for the whole western community forestry operations run by VicForests. According to Vic Forest own reports, total yield for the whole community forestry operation in western Victoria is 21,000 tonne per annum. The 2016–2017 VicForests annual report showed a total revenue for the so-called western ‘community forestry’ operation was approximately $773,000, while at the same time VicForests received a grant from the Victorian Environment Department of $678,000 (per annum) paid in advance. Assuming the difference of $95,000 per annum is made from timber sales, the total costs to the Victorian Government, and taxpayers, is more than $500,000 (half a million dollars), in return for the destruction to large areas of scarce and vulnerable publicly-owned native forest and woodland, which supports few jobs.

Native forestry in western Victoria should no longer be given special treatment. As part of regional forest agreements, five-yearly independent reviews take place. In 2010 the Independent Review on Progress with Implementation of the Victorian Regional Forest Agreements Final Report recommended: ‘There are a number of key issues that I have recommended the Parties consider for them continued implementation of the RFAs. The most critical of these is consideration of cancelling the West Victoria RFA...’\(^1\). The Victorian Government recently signed a scoping agreement with the federal government to review all Victorian RFAs for the five-year period 2009–2014. The review is expected to include the western RFA and will be completed in 2018, hence it would be timely for VEAC in this investigation to make recommendations or at least comment on the arrangements for the forest in the investigation area and the western RFA are still relevant.

We would argue that these arrangement are no longer relevant and should be removed, at least form the West, if not the whole of the state, especially the current exemption from national environmental laws afforded under the RFAs.

We note that the background report prepared for VEAC on socio economic profile of the investigation areas, *Central West Investigation Area Socioeconomic Profile* prepared for the Victorian Environmental Assessment Council, Gillespie Economics, May 2018, highlights the increased importance of tourism as a growing industry. Based on Figure 12 it is evident that the key engines of growth in the Hepburn, Moorabool and Macedon Ranges LGAs economy are:

- Accommodation and Food Services - indicative of tourism;
- Agriculture - predominantly Beef Cattle (Specialised) Sheep Farming (Specialised) and Mushroom and Vegetable Growing;
- Aged Care Residential Services;
- Meat and Meat Product Manufacturing; and
- Mining - predominantly Construction Material Mining.

### 2.2.2 Economic Benefits of Parks

While the native forest industry is in decline across Victoria, there is even less activity in the investigation areas. Parks on the other hand are and can be a key attractor for visitors, especially due to the relatively close proximity to a growing Melbourne.

Many studies have documented the economic value of parks across Victoria, including in the investigation area, and new parks appropriately supported by government investment in tracks and trails, signage and land management, can provide significant regional employment opportunities.

Healthy parks provide the community with a range of regulating services such as water purification, air filtration, climate regulation, pollination of agricultural crops and coastal protection, along with maintenance of habitats for native species, provision of nursery populations and genetic diversity. Healthy parks provide cost effective ‘green infrastructure’ services that provide additional benefits. These ‘ecosystem services’ are worth many million to the community annually. \(^9\)

In strict economic terms, Victoria’s parks contribute over $2.1 billion to local economies and support 20,400 jobs. Nature-based visitors spent an estimated $11.5 billion (including package expenditure by overseas visitors) in Victoria – up by 15.4 per cent on year-end June 2015. Parks

Victoria processed more than 102,250 bookings for camping and accommodation in parks, representing more than 173,600 overnight stays for 230,460 visitors.  

Various studies have been done over the last 10 years demonstrating the economic value of Parks, which bring measurable direct and flow-on economic benefits to local, regional and national economies.

A study for Outdoors Victoria in 2017, by Marsden Jacobs into the value of Victoria’s outdoor economy, found around 46 million nature-outdoor activities in Victoria, 36 million in Victorian Parks. The report estimated that nature-based outdoor activity related expenditure generated $7.4 billion of sales with Victoria a year, supporting 71,000 fulltime equivalent positions.

The report shows that an outdoor economy already supports around 1,000 jobs FTE in Daylesford and Macedon Rangers and 1200 job FTE in the Goldfields.

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12 https://outdoorsvictoria.org.au/research/economics/
An earlier study in 2010-2011 for Parks Victoria by Deloitte Access Economics in 2014, shows the total economic contribution of park-attributable tourism Gross Value Added (GVA) for existing parks in Daylesford and Macedon Ranges was $23 million per annum, around 269 people employed and for the Goldfields $17 million and 240 jobs.

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The report notes:

“Around half of the total economic contribution relates to direct impacts, where there is a direct relationship between the visitor and the producer of the good or service. The other half relates to downstream flow-on and supplier effects of tourism demand for intermediary materials or services (e.g. fruit and vegetables supplied to a restaurant visited by a tourist on a trip to visit a park).

In the absence of a specific data on the primary motivation for a park visit, the economic contribution analysis includes assumptions about the motivation of visitors in a tourism region using a ‘drawcard approach’ to estimate the proportion of expenditure that can be attributed to parks.
It should be noted that the economic contribution has been derived using visitor data from Tourism Research Australia rather than Parks Victoria data. This is because use of the Parks Victoria data results in park-attributable tourism expenditure was greater than the total tourism expenditure derived in the regional tourism satellite accounts. This suggests that the tourism estimates above may be conservative.”

2.2.3 Opportunities from National Parks, Walking, Hiking and Nature Play

National Parks provide the trails and tracks that are central to most nature-based walking in Australia. Most walking – be in day or overnight – occurs wholly or partly within National Parks or other parks.

Studies have shown that recreational walking is a popular pastime in Australia, and there is some evidence that it is growing in popularity. The Exercise, Recreation and Sport Survey (ERASS) 2010, undertaken by the Australian Sports Commission states that just under 5 percent of the Victorian population reported they had bushwalked in the previous 12 months. This figure may, however, understate the actual number of recreational walkers. Most of the data distinguishes between short walks (less than one hour) and longer walks (day or overnight). The evidence from NSW and Victoria is that around 48 percent of visitors to National Parks participate in walking of some kind, mainly day walks less that one hour.

Evidence from reports and surveys:

- Over 200,000 Victorians (4.6 percent of the total population) reported they had bushwalked in the previous 12 months, most multiple times. A further 1,600,00 (36.6 percent) participated in other forms of walking;  

- An ABS study in 2006 found that more than half a million Australians aged 15 years and over (3 percent of the population) had bushwalked during the previous 12-months, with 66 percent doing bushwalks 53 times or more in the period. Of all bushwalkers, 87% participated on a non-organised basis only, whereas only 7% of bushwalkers participated solely in organised bushwalking;

- A Roy Morgan study found that between October 2010 and September 2015, the proportion of Australians 14+ who reported going hiking/bushwalking on a regular basis grew from 2.9% to 5.2%, while those who participated either regularly or occasionally increased from 15.6% to 27.3% (or more than 5.3 million Australians).

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• 81% of the bushwalkers identified by the Roy Morgan survey (2015) were more likely to have gone to a National Park or forest than other Australians during the previous 12 months;
• In 2013, a Parks Victoria survey found that short walks are by far the most popular activity in both national/state parks and metropolitan parks, undertaken in around 40% of visits. Almost 1,400,000 visitors completed short walks (less that one hour). This represents 37 percent of the sample, while 416,000 (11 percent) completed longer walks (day/overnight);\(^{17}\)
• Surveys conducted of visitors to Victorian and NSW National Parks found that walking is the major reason for their visit. Almost half of the respondents indicated that the focus of their visit was walking. \(^{18}\)

When considering social economic assessments VEAC should prioritise the economic opportunity of existing walking infrastructure at Mt Cole such as the Beeripmo walk and the endurance walk in the Pyrenees. There should also be consideration of complementing new parks with a number of shorter walks, to facilitate short stay visitation. Data suggest that these type of walks are popular, even more so than longer multi-day walks. Walks can also be effectively marketed as part of regional tourism packages, with visitors staying in local accommodation rather than, necessarily just camping. Other nature base activities should also be supported as part of park implementation packages.

While the native forest industry is a minor industry and in decline across the investigation area, the tourism industry is growing as an employer. Parks are a popular drawcard and can be a key attractor for visitors. Due to the relatively close proximity of the investigation area to a growing Melbourne, we suggest that prioritising existing walking infrastructure and development of short walks as well as other parks establishment programs such as signage, active land management in partnership with indigenous owners, and good promotion and marketing would help expand the levels of regional visitation and employment, while conserving the unique natural feature of the area.

\(^{17}\) Since 2001 research companies have conducted annual telephone surveys and face to face interviews looking at visitation to Parks Victoria properties. During that time, three different companies have been employed - Newspoll, Market Solutions and Ipsos. The latest surveys were collected and analysed by Ipsos on behalf of Parks Victoria in 2016/17. A dual frame telephone (CATI) approach consisting of Random Digit Dialling (RDD) landline and mobile sample frames (n=11,200) and, for international visitors, face-to-face interviewing within the departure lounge at Melbourne airport (n=800) were used to collect data. The sample was weighted to be reflective of the population by location, gender and age.

2.3 Mt Cole- Current Native Forest Logging Issues & Impacts

2.3.2 Mt Cole Logging, Silviculture, Sustainable Yield and impacts on values.
The Draft VEAC reports provides only basic assessment and discussion of the forestry related issues, in the Mt Cole investigation area. While selective harvesting (multi-aged stand management) is discussed a number of times through the draft report the use of other silvicultural methods in the investigation area, are not discussed. There are at least six silvicultural treatment categories, used in the west of the state:

- Even-aged stand management
- Multi-aged stand management
- Specialty timber selection
- Ground collection
- Reforestation
- Forest Management Operations
- Removal and/ or utilisation of timber resulting from forest management operations
  - hazardous tree removal
  - Salvage of small areas/ individual trees (e.g. from storm damage)

Even stand management is essentially clear fell logging, of which there are 18 coupe’s covering 351 hectares listed in the current Vic Forests Timber Utilisation Plan.19 Almost all of the even-aged stand management coupes are in the relatively small area of Mt Cole, with one being listed for the Wombat forest.

In about 2003, due to an inability to supply sawlogs from the Mt Cole area forests, the government bought back the licence. At that time, the sustainable yield was considered to be 800 cubic meters per annum. Considering that this could not be supplied 15 years ago, it seems inconceivable that the sustainable yield is now considered to be 1500 cubic meters. During this time, an estimated 3,000 tree’s fell in extreme wind events and areas of forest have been destroyed by Armilleria fungus (which causes a form of die back) further reducing sawlog availability.

The Timber Utilisation Plan 2017, identified 47 logging coupes at Mt Cole, 36 of these were production coupes and the other 11 called Forest Management Operations. Of the 36 timber production coupes covering about 1267 hectares, 18 are flagged as ‘multi-staged management’, which is a type of selective logging. The 17 other coupes, covering 330 hectares are flagged as “even-aged management” in other words clear fell industrial logging. Map

At least five of the seventeen clear fell coupes have been logged in the last few years, it is assumed that this is part of VicForests three year trial, commenced in 2015, two in the last six months, and at least one had just finished.

According to Vic Forest, sawlog is being supplied to Pyrenees Timbers at Chute to produce kiln dried timber for flooring, decking and green saw timber for construction. The waste is used to generate heat for their drying kiln and they also provide dry wood chips to the bioenergy heater at the Beaufort hospital. Residual timber from operations is purchased by Tiley Industries who are focused on firewood but are looking to saw some of the higher quality residual wood into tile battens. Tiley also conduct the harvesting and haulage operations in the area.

We note (page 97) of the Draft proposal report, VEAC state “In the last four years around 2000 cubic metres of sawlogs have been harvested per year from these forests, mostly from Mount Cole and supplying the sawmill at Chute...” This is significantly more than had been reported by VicForests previously as part of the so called pilot and higher than the suggested suitable harvest level. In 2015 VicForests state “...the sustainable harvest level for this forest is 1500m3 of D+ sawlog per year with VicForests licencees currently harvesting around 1000 m3”. 20

VicForests also suggest that they will be preparing a report on the trial operations at Mt Cole and if there are no significant barriers identified, they plan to extend harvesting into the longer term. 21

Results of this report should be publicly released and at minimum assessed by VEAC, in developing recommendations, but at current reported rates of logging the area, already exceed the reported sustainable yield and have a range of impacts on forest health, conservation and recreational values.

Some of the future areas flagged for clear fell logging have significant conservation values and need to be retained to ensure long-term ecological health for the area. Likewise amenity of camp grounds Ditchfields, Smith Bridge, Victoria Mill) and the popular Beeripmo walk is threatened by logging activities (see figure Map of Mt Cole Logging Coupes and recreational assets below).

There are also significant numbers of threatened flora and fauna, including the endemic Mt Cole Grevillia (see maps on following pages of Mt Cole logging coupe’s and VBA records). Little of the accessible high production timber forests at Mount Cole have been protected in national parks or other reserves and this needs to be considered in any assessment of uses (see section 2.3 on reserve design).

According to VicForests they are planning to trial a selection coupe to look at whether this type of harvesting may assist in minimising the browsing problem and reduce the risk of regeneration failure, while also acknowledging the issues related to Armillaria, however we are extremely sceptical of this claim (see next section below 2.3).
Figure X Mt Cole – Logging coupes & Recreational Assets

**Recreation**
- Beechgrove Walk
- Walking tracks
- Campgrounds, Picnic areas and Scenic Lookouts

**Public Land**
- Parks and Reserves [PARKRES]
- State Forest [PLM25]
- Other Public Land [PLM25]
- Midlands Forest Management Area boundary [FMA25]

**Logging coupes**
- Clearfell logged coupes on current TUP
- Planned logging coupes on VicForests Timber Utilisation Plan [TUP _Apr2017]
- Even-aged stand management (clearfell logging coupes)
- Multi-aged stand management
- Forest Management Operations
- Previously logged coupes [LASTLOG25] (22 May 2018)
  - 1989-90
  - 1994-95
  - 2014-15
  - 2016-17

**Roads**

**Watercourses**
VBA Threatened species records, named.
Mt Cole Clear fell Logged Coupes - August 2018

Coupe 1

Reference on attached map: Clear fell coupe number 1
Coupe number in Vic Forests Utilisation Plan: 185-527-0101
Area of forest logged: 25 hectares
Last logged within: Last 6 months
### Coupe 2

**Reference on attached map:** Clear fell coupe number 2  
**Coupe number in Vic Forests Utilisation Plan:** 185-517-0101  
**Area of forest logged:** 7.1 hectares  
**Last logged within:** Last 6 months

### Coupe 3

**Reference on attached map:** Clear fell coupe number 3  
**Coupe number in Vic Forests Utilisation Plan:** 185-517-0103  
**Area of forest logged:** 15.4 hectares  
**Last logged within:** Most likely the last 12 months
Coupe 4

Reference on attached map: Clear fell coupe number 4  
Coupe number in Vic Forests Utilisation Plan: 185-531-0107  
Area of forest logged: 7.4 hectares  
Last logged within:  
Most likely the last 12 months

Coupe 5

Reference on attached map: Clear fell coupe number 5  
Coupe number in Vic Forests Utilisation Plan: 185-519-0101  
Area of forest logged: 9.7 hectares  
Last logged within:  
Within the last two years
2.3.1 Armillaria (root rot) & logging at Mt Cole

We seriously question the proposition put forward by VEAC (page 98-99) of the draft proposals paper regarding the veracity of logging in managing Armillaria. Studies in WA and Victoria indicate that logging increases Armillaria activity to an extent depending on climate and soil conditions. Some studies suggest selective logging may be worse, but no published study we can find has shown that logging (in any form) or burning reduces Armillaria activity. In fact studies point to no logging being the most successful strategy, if the intent is disease control and forest health. However if the intent is to sustain timber production then there have been various trails over the last 30 or so years, in Australia, none of which support the idea that logging is good for Armillaria control, rather most are focused at best on mitigation, so logging can continue.

VEAC states (98-99): “Selective harvesting was assumed to be a contributing factor to the spread of Armillaria because it left infected stumps and trees in the coupe. In 1978, a small trial was established to compare clearfelling treatments at Mount Cole but these were not effective in reducing disease impacts. Today there are many patches of dead and dying trees, most easily observed along Mount Cole Road and at Victoria Mill picnic area.”

This repeats a 2013 department facts sheet, “Clear felling (with retained seed trees) followed by a hot regeneration burn will be used at Mt Cole. Past experience has proven this technique to be the most effective way to create a seedbed and regenerate the forest after harvesting. It is also considered the best means of limiting the spread of the naturally occurring Armillaria fungus which can cause patches of forest dieback.”

A number of studies appear to have been carried out at both Mt Cole and Wombat forests in 1980’s. Research by Kile, published in 1981 suggest:

“Armillaria luteobubalina has a discontinuous distribution within the Mount Cole, Wombat and Macedon forests and, although the occurrence of the disease of Eucalyptus spp. and distribution of the pathogen apparently coincide, the possibility of cryptic infections on the roots of trees in healthy stands cannot be discounted. The fungus spreads by root contact. Its frequent presence on the roots of declining trees, and its ability to grow rapidly in the cambial zone, enable it to infect a high proportion of the sapwood of logging stumps in areas where it occurs. Most stump infection occurs within 5 yr of harvest and the fungus may survive in the stumps for up to 30 yr.”

22 The State of Victoria Department of Environment and Primary Industries, Timber harvesting in Mt Cole State Forest September 2013,
The second paper in 1983 is more explicit "It is believed that forest harvesting in areas where the fungus occurs, especially relatively frequent partial cutting, creates additional food base for the fungus and increases the intensity and extent of disease development by this mildly aggressive pathogen, i.e. aggravated endemic disease."

"It is concluded that root rot caused by the fungus is endemic in these forests but that logging has aggravated the disease"24

The later 1989 study at Mt Cole also suggest "There is little or no scope for manipulating the food base for Armillaria by varying the harvesting treatment and/or the season of treatment."25

Studies published in 1994, relating to Karri Forest in Western Australia, suggest clear-felling may make it worse.

"The effect of logging on rhizomorph growth in the karri forests would therefore appear to depend mainly on the balance between any significant increase in soil temperature (as a result of reduced vegetation cover) and any change in soil moisture levels, with the latter depending on the balance between any rise in the sub-surface water table (due to the effects of clear-felling) and increased drying of the surface soil due to increased solar heating and wind turbulence. The incorporation of organic matter into the soil, by deep ripping or ploughing, would tend to increase rhizomorph growth."26

A second study in Karri forest highlights the impact of thinning in Amillaria spread, but no logging is better.

"Ten years after thinning, the level of disease increased significantly with increased thinning intensity, and disease accounted for 51% of the mortality in the plots thinned to 200 stems/ha. Fifteen years after thinning, the level of infection had increased in all treatments but was still significantly lower in the unthinned treatment. In the thinned treatments, 54–63% of the trees ranked in the largest 200 stems/ha were infected, and 50–100% of the mortality within these trees was attributed to Armillaria luteobubalina. In the unthinned treatment, no mortality within the dominant trees was associated with disease. Ten years after thinning and fertilizer treatments, it could not be determined whether fertilizer application had had any effect on the level of disease."27

24 Kile, G.A Armillaria Root Rot in Eucalypt Forests: Aggravated Endemic Disease! PACIFIC SCIENCE, Volume 37, October 1983
25 IB Tomkins, JD Kellas and RO Squire; Effects of Season and Harvesting Treatments on Soluble-Sugar and Starch Levels in Eucalyptus obliqua and E. globulus subsp. bicostata Roots, and Implications for Armillaria Control Australian Journal of Botany 37(4) 305-312 Published: 1989
Whole tree stump removal has been trial in WA Karri Forests and according to 2007 paper by Richard Robinson, Department of Biodiversity, Conservation and Attractions, “In selectively logged stands in the Wombat Forest in Victoria, Kellas et al. (1987) found that the cutting intensity per se did not affect disease development but the frequency of cutting was critical to the spread of the fungus because the regular creation of stumps increased both the inoculum level and the probability of residual trees being in close proximity to inoculum.” And “Although stump removal and ripping following clear felling on high hazard sites in the Wombat Forest in Victoria did not reduce Armillaria-caused mortality of planted regrowth in the first 18 years (Kellas et al. 1998), no information is available on the long-term effects of stump removal.”

Robinson 2007, clearly articulates the driver for this approach as a rational for various trails and experiments over the last 30 years for ensuring continued logging “The development of control options that deal with potential spread of disease but retains the increase in growth and yield gained from thinning is therefore a priority. If silviculture and disease control occurred simultaneously, the social, ecological and financial advantages for sustainable forest production in the long-term would be significant.”

Robinson 2007 speculates on various options which include “Do not thin infested stands, which concludes: “This would be the preferred option as far as disease management is concerned as it allows stands to naturally develop and cope with disease”. He further speculates on an option to leave thinning until later in the silvicultural cycle, say 50 years, then clear fell at about 80 years and regenerate, but cites only circumstantial evidence to support this proposition. 28

It is clear that if the intent is Armillaria disease control and forest health, no logging is the best option.

28 Richard Robinson 2007 Armillaria luteobubalina in regrowth karri stands in Western Australia Conference Paper · November Department of Biodiversity, Conservation and Attractions. https://www.researchgate.net/publication/309205404_Armillaria_luteobubalina_in_regrowth_karri_stands_in_Western_Australia
Mt Cole 1980’s Research Trial Plot (August 2018)
2.4 Revised Reserve Design for better protection of Mt Cole

Identified as having high conservation values under the VNPA’s Small Parks Project in 2010, Mount Cole harbours in its rich forests many significant natural values including, the most western extent of mountain brushtail possum, over 130 species of birdlife, nine threatened fauna species, thirteen threatened flora species, (not including the likely endangered endemic Mount Cole Grevillia which is only found in this area), three endangered vegetation types and two vulnerable vegetation types under-represented elsewhere in Victoria’s formal reserve system.

VEAC’s investigation states: “Some areas that the analyses identified as high-ranking areas of rare and threatened species habitat are recommended to remain state forest. These areas include parts of the Mount Cole, Musical Gully-Camp Hill and Trawalla-Andrews state forests. These areas are relatively small and dispersed and would be difficult to capture in protected areas without either adding the entire area to protected areas or establishing a network of smaller protected areas throughout the broader area.”

VNPA disagrees with this statement and believes there are additional unique and important ecological features and recreational values that need to be considered in the VEAC investigation process for Mount Cole specifically. Of major concern is the lack of protection recommended to be afforded to Mount Cole– to largely remain in state forest, where 70 per cent would remain open to intensive logging. These important ecological features and recreational values we believe are worthy of better protection include:

5. **Headwaters of the Wimmera River**: if protected could improve stream condition further downstream;
6. **Mount Cole Grevillea**: is extremely rare and declining in its highly restricted distribution in the Mount Cole area;
7. **Victoria’s popular Beeripmo Walk**: where surrounding areas are currently and scheduled to be logged;
8. **Montane Plateau vegetation type**: will be critical in acting as an important climate change refuge for species movement and survival;
9. **Herb-rich Foothill Forest vegetation type**: that if protected would reduce its shortfall by more than a third within the Central Victorian Uplands Bioregion;
10. **Special Protection Zones (SPZ)**: currently spread across many areas of Mount Cole, should exclude logging activities to protect habitat, for example for Powerful Owl.

Additionally, Mount Cole has among the highest condition of native vegetation condition in the area. Stronger protection for Mount Cole will be critical looking ahead.

*Page 34*
We are putting the case forward for stronger protection of Mount Cole in a national park under the National parks Act 1975 – either fully protected in a national park, or in a multi-tenure system with an increase in area under a national park and an adjoining regional park. This would allow for more uniform management, and the protection of Mount Cole’s values against the threats of intensive logging and other potential impacts.

Whilst the extension of Mount Buangor National Park by 1,406 hectares, is welcome, this should be extended to give Mount Cole the protection it deserves.

The above unique and important ecological features and recreational values are delved into in more detail, which we have used as criteria for a revised reserve design for the better protection of Mount Cole:

1. Wimmera River headwaters

Headwaters of rivers in other parts of the investigation area, such as the Moorabool and the Maribyrnong, have been recommended to gain protection in new parks, yet unfortunately the Wimmera headwaters have missed out.

Protecting the significant headwaters of the Wimmera could help improve stream condition, particularly where lower down in the river there is concern about the health and decline of platypus (Ornithorhynchus anatinus).

Platypuses were once widely distributed throughout the Wimmera Catchment shown from surveys conducted from 1997 to 2004, however changes in land use, altered flow regimes, extended drought conditions, habitat loss, and in-stream sedimentation have resulted in significant declines. 29

A recent report published in February 2018, looking at the distribution of platypus in the upper Wimmera using a combination of eDNA testing and live trapping, has sadly found no records of platypus. Platypus are important indicators of river health, and should potential future introduction of the platypus occur in the upper Wimmera river occur, stream condition would need to be healthy enough. 30

Stronger protection is needed for the Wimmera river headwaters.

If not included in parks, at a minimum the Wimmera River headwaters should be listed as a Heritage River and protected under Schedule II of Heritage Rivers Act 1992, to be consistent with similar listings further downstream.

2. Mount Cole Grevillia

Much of Victoria’s 49 Grevillea species occur in central Victoria, many endemic or threatened with a highly restricted range. Mount Cole is a significant place for the endemic Mount Cole Grevillea (*Grevillea montis–cole subsp. montis–cole*), as it is only found in the Mount Cole and Mount Buangor area in eucalypt forest amongst granite outcrops above 500 metres sea level, according to Flora of Victoria (Forman, 2018).

The 78 records extracted from the Atlas of Living Australia span from the Victoria Mill Scenic Reserve region south of Mount Ben Nevis, across the Mount Buangor/Mount Cole montane plateau, south along Mount Cole Road, and also in the Cave Hill Creek region down to as low as ~450 m ASL (Forman). Many records occurred before 1997, and the more recent records are around the Cave Hill Creek region and along Mount Cole Road immediately to the south.  

There is evidence of serious decline in the last decade or so and together with geographic contraction is in the order of 75 per cent, 2,570 hectares (before 1997) down to only ~700 hectares mostly centred in the Cave Hill Creek region today. It is speculated for the Mount Cole Grevillea this species has also been adversely affected by intensive logging at Mount Cole, recreational impacts, burning and climate change. Urgent measures may be required to ensure its long term conservation.

Although the Grampians is apparently the stronghold for this species, the Mount Cole population appears to be the biggest outlier and should remain in the long term an important refuge for this restricted Victorian endemic.

Further field investigation is urgently required, but still this puts a case forward for changing its conservation status, from its current listing as rare, to endangered or even critically endangered. The long term conservation of this distinctive species rests entirely on the future management of the Mount Cole and Mount Buangor state forests.

The distribution of Grevillea patches as shown on the below map is uniformly distributed and overlaps with other significant values including Montane Plateau and Herb-rich Foothill Forests, and falls within many of the current logging coupes. Logging should be minimised at areas of Grevillea records to protect the future of this endemic species. Image: Forman 2018.
3. Montane Plateau vegetation type

Montane plateau patches, dominated by snow gums (*Eucalyptus pauciflora*) (but including montane shrublands and herbfields) are rare in the west of the state, but are highly critical in acting as an important climate change refuge area for species to move up to and their survival. They are a significant biogeographic connection to Eastern Alps, and one of the few suitable sites for translocation of Ballantinia – a threatened plant species.

The main montane plateau (above ~850 metres above sea level) in the Mount Cole area occupies around 740 hectares between Mount Buangor (at 965 metres above sea level) and the Mount Cole Tower (at 974 metres above sea level) (Forman, 2018).

The distribution of Montane Plateau patches is shown on the map as fairly centralised in the Mount Cole area, and its distribution overlaps with other significant values including Mount Cole Grevillea and Herb-rich Foothill Forests.
4. Herb-rich Foothill Forest vegetation type

Little of the accessible (potentially) high production timber forests at Mount Cole have been protected, with significant consequences for the region’s biodiversity. The Herb–rich Foothill Forest (EVC 023) previously has been identified as one of the only EVCs suitable for sawlog timber harvesting.

Ecosystem representation of this forest type is quoted in VEAC’s report as having a significant shortfall in formal protection which totals 12,021 hectares in the Central Victorian Uplands Bioregion. Yet there are large areas left unprotected, outside of the proposed draft recommendations for the Mount Cole area.

VNPA’s alternative reserve design would pick up an additional 4,182 hectares in national park and 561 hectares in regional park, to reduce the Herb Rich Foot Hill Forest shortfall by more than a third.

The distribution of Herb-rich Foothill Forests is uniformly spread across Mount Cole and Mount Buangor, and its distribution overlaps with other significant values including Mount Cole Grevillea and Montane Plateau, and falls within all of the current logging coupes.
5. **Recreational assets – The Beeripmo Walk**

The well-loved Beeripmo walk winds through cool fern gullies and tall forests, taking in views across the surrounding hills of both Mount Cole and Buangor State park. It is one of Melbourne’s most accessible overnight and day hikes and attracts school group visits and hikers every year.

Sections of the Beeripmo Walk and camping areas are currently adjacent to logging sites, risking the integrity of the walk's high tourism value.

The map below shows the Beeripmo walk winding through these logging coupes. VNPA has been contacted by concerned bush walkers who have come across recently logged bare patches.

The increased tourism value that could be brought from National Park status of Mount Cole has the potential to not only increase visitation, but also bring benefits to the surrounding towns. Currently, with future logging scheduled as part of VicForest logging trials, this does nothing to protect the integrity of the Beeripmo walk.

The Beeripmo walk route overlaps with the other natural values and is worthy of extra protection.
6. **Special Protection Zones (SPZ)**

The map shows a series of Special Protection Zones (SPZ) throughout Mount Cole, which are excluded from logging activities to protect significant values, including powerful owl habitat. These areas, which cover a significant area of Mount Cole, would benefit from protection in parks to protect for example the powerful owl, and for further ease of management.

Many of the SPZ also overlap with distribution of Grevillea records, Herb-rich Foothill forests and the Beeripmo walk.
Additional natural values

Also worth recognising are the important ecological communities/ecosystems that have been identified in the area:

- Small areas of grassy woodland dominated by yellow box;
- Critically endangered listed White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland’, (under the Environment Protection and Biodiversity Conservation Act 1999)
- ‘Ground Water Dependent’ or ‘Spring Soak Wetland/Woodland ecosystems,
  (The spring soak ecosystem is very closely aligned to communities recently recognised under the Flora and Fauna Guarantee Act 1988 and a detailed survey should be undertaken to determine their full distribution.)

Mount Cole has also been modelled as having the highest native vegetation condition in the Pyrenees/Mount Cole area. Rising to almost 1,000 meters from a relatively flat plain it will be an important climate change refuge for species movements and survival.

Revised reserve design map

Based on the significant over-lapping values listed above, VNPA’s revised reserve design aims to protect these values in their entirety, but could also accommodate more intensive recreational activities:

**Option 1:** A national park under the National Parks Act;

**Option 2:** A multi-tenure system with an increase in area under a national park and an adjoining regional park, still allowing for more intensive recreational uses.

One single connected protected area, as per both options, would allow for much simpler management. Whilst our preference is for the entirety of Mount Cole protected in national park, this revised reserve design is the next best option to accommodate broader recreational uses and even further streamline management. In option 2, the boundary between the national park and regional park has been follow natural contour of the road.

Not only will this revised reserve design protect Mount Cole’s significant natural values from the threats it faces, it would push Victoria closer to achieving international biodiversity benchmarks in representation across the state.
Better protection for Mount Cole is critical looking ahead, modelled as the highest native vegetation site condition in the Pyrenees/Mount Cole area. At a minimum the Wimmera River headwaters should be listed as a Heritage River, and protected under the *Heritage Rivers Act 1992*, to be consistent with this Heritage listing further downstream.

### Option 1: Full National Park

**Specific Recommendations**

- Full protection under the *National Parks Act 1975*
Specific Recommendations

- National park to have full protection under the *National Parks Act 1975*
- The adjacent regional park, could still accommodate more intensive recreational uses
- The boundary between the national and regional park has been designed to follow the road
At a minimum, in the absence of better protection in parks, the Wimmera River headwaters should be listed as a Heritage River, and protected under the *Heritage Rivers Act 1992*, to be consistent with this Heritage listing further downstream.

Further consideration needs to be given to remediate the dam on Mount Cole (Mt Cole Reservoir), which is no longer operational. Allowing environmental flows should be considered, as farmers and the environment down-stream are not receiving any water, via Mt Cole Creek.

**Other areas in the Mount Cole-Pyrenees Block**

We support the Biolinks Alliance submission statement:

*Other areas that should be considered for a higher conservation status are Musical Gully, Camp Hill, Trawalla and Glenmora. In the state-wide analysis of biodiversity habitat values (p95), “high rankings occurred in extensive areas of the Mount Cole–Pyrenees block including .... Musical Gully and Trawalla state forests. This reflects their importance in providing habitat for many species in a heavily cleared landscape”. Musical Gully and Camp Hill are home to the threatened Ben Major Grevillea. Camp Hill and Trawalla contain Brush-tailed Phascogales and Musical Gully has suitable habits where the species could expand its range. Glenmona is noted for its threatened species and communities (p96). Further, “important areas for maintaining ecological connectivity and resilience lie between the smaller forest blocks of Trawalla-Andrews and Musical Gully-Camp Hill” (p97). Despite their values, all or a large part of these forests are recommended to remain as state forests that “would continue to allow for commercial timber harvesting and a wide range of recreational activities”.*

**Recommendations:** that recommendations relating to Musical Gully, Camp Hill, Trawalla and Glenmora forests be reviewed to protect catchment and biodiversity values by changing their status to Bushland Reserves.
3.0 Comments on Specific Draft Recommendations

3.1 VNPA Comments on Draft VEAC General Recommendations

Table is organised around VNPA response (agree/disagree/ agree with changes) and detailed comments. Except where detailed comments are provided on specific elements of draft recommendations, recommendations are not transcribed in full. E.g. if we agree with it, just the top line of the recommendation is listed (to save space).

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>VNPA response (agree/disagree/ agree with changes)</th>
<th>VNPA comments</th>
</tr>
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<tbody>
<tr>
<td><strong>Aboriginal place names</strong> &lt;br&gt;R1 Government consults with relevant Traditional Owner groups regarding naming of recommended new parks and reserves</td>
<td>Agree, with changes</td>
<td><strong>General recommendations</strong>&lt;br&gt;&lt;br&gt;We support strengthening and recognising of the role, cultural values and aspirations of Traditional Owners in public land use.</td>
</tr>
<tr>
<td><strong>Additional resources</strong> &lt;br&gt;R2 Government allocates adequate financial and staff resources for implementation of these recommendations and ensures that the objectives of the report and recommendations are achieved.</td>
<td>Agree, with changes</td>
<td>This is important recommendation.&lt;br&gt;&lt;br&gt;While the commentary in the text (page 57) highlights a number of areas which may need funding, it fails to discuss to highlight key ecological issues for example feral animal control, fire management or the need for ecological restoration projects, but rather groups these into the rather vague “...resourcing for establishment of new parks and reserves...”&lt;br&gt;&lt;br&gt;While the commentary flags fire wood and changes to recreation one the areas, these are not the only issues.&lt;br&gt;&lt;br&gt;VEAC should consider making specific recommendations based on either research or feedback from the community on specific priorities for funding.</td>
</tr>
<tr>
<td><strong>Assistance for adversely affected individuals and businesses</strong> &lt;br&gt;R3</td>
<td>Agree, with changes</td>
<td>This is important recommendation, which we agree with.</td>
</tr>
</tbody>
</table>
Government establishes a process to evaluate the impacts on individuals and businesses of implementing recommendations in this report and provides assistance to minimise any effects where required.

However in isolation it is framed in the negative with only looking at minimisation of industries which are effected.

No consideration is given to industries which may be enhanced e.g. tourism, water yield, potential for carbon, and other users.

VEAC should consider the potential and make appropriate recommendation about the value of promotion of new parks and mechanisms or funding which may enhance the regional development impacts of new parks.

<table>
<thead>
<tr>
<th><strong>Interim management and minor boundary adjustments</strong></th>
<th><strong>Agree</strong></th>
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<tr>
<td>R4 Upon government acceptance of VEAC’s recommendations, relevant land be managed in accordance with those recommendations.</td>
<td></td>
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<tr>
<td>R5 Implementation of recommendations allows flexibility for minor boundary adjustments.</td>
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| Simplifying reservation procedures R6 Priority be given to minimising field survey where possible and simplifying boundary definition and preparation of gazettal plans to implement government-accepted recommendations, with site survey if required to resolve specific management issues. | Agree |

<table>
<thead>
<tr>
<th><strong>Allowing future changes to Aboriginal title parks and reserves</strong></th>
<th>Agree, with changes</th>
</tr>
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<tbody>
<tr>
<td>R7 Government considers legislative amendments to the Traditional Owner Settlement Act 2010 that provides for a process allowing future changes to Aboriginal title land by agreement of the parties. Such amendments should include provisions for additions, boundary adjustments and changes to public land use classification.</td>
<td>Agree with the principle but the wording of the recommendation is open ended. While VNPA would support an automatic change if there were additions to park estate, where there was agreement with Traditional owners, we would not necessary support the reverse, which is delisting or de-gazettal of parks, without appropriate level of public scrutiny, such through parliament.</td>
</tr>
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**Game sanctuary revocation**

**R8**

To ensure there is no ambiguity, any game sanctuaries in the investigation area declared under the Game Act 1915 be revoked.

| Disagree | Agree with removing ambiguity, however the VEAC report fails to deal in any strategic way or provide recommendations about how to reduce deer numbers beyond recreational hunting, which has by-large failed as management strategy to reduce the overall population of this damaging feral species. 

| --- | --- |

We also note that local media coverage “Pyrenees Advocate” has reported community concern over opening up Mt Cole to recreational hunting. We also do not agree with the recommendation for Mt Cole to be retained as state forest only.

**Landscape connectivity R9**

That small blocks (nature reserves, bushland reserves, stream frontage, bed and banks reserves and road reserves) be managed to maximise their ecological function and value to native species that depend on habitat connectivity, through planning partnerships between community groups, government, catchment management authorities, Trust for Nature and private land managers.

| Agree, with changes | This is important recommendation, though vague. 

It is unclear if the recommendation relates to specific public land blocks in the investigation areas or is a catch all for highlighting the importance of any remaining vegetation. 


The regional Riparian Action plan notes: “Parks Victoria plays a significant role in the management of Crown water frontages, particularly those with highly significant public values...” page 49. 

VEAC should consider these priorities area in detail when framing the recommendations (R9) and (R10) and General recommendation (H) 

While the sentiment correct, there are currently not a clear mechanism for planning or management partnerships, for specific smaller crown land conservation reserves or parks, no always a clear requirement for a management plan (except for national parks). |
### Catchment management

**R10**
National, conservation and regional park management priorities include the protection of water quality and yield.

<table>
<thead>
<tr>
<th>Agree, with changes</th>
<th>The benefits of changes in land status towards regional riparian action plan targets should also be considered.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantification of improvements water quality and water yield of removing logging in key headwaters of rivers in the wombat and Mt Cole should be considered.</td>
</tr>
<tr>
<td></td>
<td>We note that the draft report states on page 60:</td>
</tr>
<tr>
<td></td>
<td>“The upper Wimmera River catchment has been identified as a high priority project for investment in both the Water Plan and the Wimmera Regional Delivery Plan (2013-2018). Given the importance of these water supplies to this region, it is important to ensure the catchments are managed in a way that maintains a reliable supply of high quality water. Important water supply areas are included in recommended new national and regional parks and protection of water quality and yield should be explicitly recognised in the management of these new parks.”</td>
</tr>
<tr>
<td></td>
<td>We note little of the Mt Cole and the associated headwater of the Wimmera River have been protected in national or regional parks and will be left open for logging, which can impact on both yield and water quality.</td>
</tr>
<tr>
<td></td>
<td>This recommendation should also consider an expanded role for protection of rivers, under the Heritage Rivers Act. For example, if Mt Cole cannot be protected under the national parks act, the headwater of Wimmera River and potential others should be designated the Heritage Rivers Act (scheduled 2)</td>
</tr>
<tr>
<td></td>
<td>See section 2.4 Mt Cole Reserve Design.</td>
</tr>
</tbody>
</table>

### Domestic firewood access

**R11** Government establishes a policy or process that prioritises access to domestic firewood on public land to local communities most reliant on this resource.

<table>
<thead>
<tr>
<th>Agree, with changes</th>
<th>We accept, although request ‘prioritisation of access’ is done within the limits of sustainable harvesting of firewood, and thereby the following should be included in the process:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- We support the reintroduction of permits for fire wood collection.</td>
</tr>
<tr>
<td></td>
<td>- A management plan for each regional park or state forest, which allows firewood collection, and develop a long-term strategy for domestic firewood collection.</td>
</tr>
<tr>
<td>General recommendations for national parks</td>
<td>Agree, with changes</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>A That national parks shown on map D (numbered A1 to A3) and described in chapters 5 and 7:</td>
<td></td>
</tr>
<tr>
<td>(a) be used to:</td>
<td></td>
</tr>
<tr>
<td>(i) permanently protect the natural environment and natural biodiversity along with underlying ecological structure and supporting environmental processes</td>
<td></td>
</tr>
<tr>
<td>(ii) protect the rights and interests of Traditional Owners, native title holders and Aboriginal Victorians, and their cultural values</td>
<td></td>
</tr>
<tr>
<td>(iii) protect historic sites and values</td>
<td></td>
</tr>
<tr>
<td>(iv) provide for ecologically sustainable scientific, educational, inspirational, recreational and visitor opportunities consistent with conserving those values;</td>
<td></td>
</tr>
<tr>
<td>(b) generally permit the following activities:</td>
<td></td>
</tr>
<tr>
<td>(i) bushwalking, nature observation, heritage appreciation, picnicking</td>
<td></td>
</tr>
<tr>
<td>(ii) camping in designated campgrounds and other areas specified by the land manager</td>
<td></td>
</tr>
<tr>
<td>(iii) car touring, including four wheel driving, on formed roads and vehicle tracks</td>
<td></td>
</tr>
<tr>
<td>(iv) trail bike riding on formed roads and vehicle tracks</td>
<td></td>
</tr>
<tr>
<td>(v) mountain biking and cycling on formed roads and vehicle tracks, and on other tracks and paths specified by the land manager</td>
<td></td>
</tr>
<tr>
<td>(vi) horse riding on roads and tracks specified by the land manager (see note 1)</td>
<td></td>
</tr>
<tr>
<td>(vii) recreational fishing</td>
<td></td>
</tr>
<tr>
<td>(viii) apiculture at existing licensed sites</td>
<td></td>
</tr>
<tr>
<td>(ix) research, subject to permit;</td>
<td></td>
</tr>
<tr>
<td>(c) exclude the following activities:</td>
<td></td>
</tr>
<tr>
<td>(i) harvesting of forest products (see note 2)</td>
<td></td>
</tr>
<tr>
<td>(ii) grazing by domestic stock</td>
<td></td>
</tr>
<tr>
<td>(iii) recreational hunting and use of firearms (see note 3)</td>
<td></td>
</tr>
</tbody>
</table>

We support the bulk of the areas proposed for national parks, with the exception of Mt Cole (see section 2.3 in main body of the submission for detailed discussion of this).

We also disagree with the allowance of exploration and mining within existing permits and licences. Significant areas of the wombat forest for example are subject to exploration licences and there have been attempt in the past around 2012 to undertake damaging mining operations, under these licences (see appendix II for detail)

These should be extinguished as part of the designation under the national parks act. E.g c) iv) exploration and mining, other than continuation of operations within existing permits and licences, as approved

It also unclear why continued minerals exploration is allowed within proposed national parks (in theory a higher level of protection), but not listed in the other tenure’s such as Regional parks, bushland reserves, historic parks (see General recommendation B,C,D,E,F,)

We also thing that Footnote 2: Ecological Thinning, should be re-worded, removing the term ecological thinning and replacing with the term “Ecological restoration” or similar. We think there is great potential for ecological restoration practices which can open up certain woodlands and have at least short term benefits for some ecological features, as seen in range of studies.


(iv) exploration and mining, other than continuation of operations within existing permits and licences, as approved
(v) dog walking, except as specified in recommendations A1 to A3 (see note 4);
(d) include unused road reserves adjoining parks where appropriate; and
(e) be added to Schedule 2 to the National Parks Act 1975.

However the term ‘ecological thinning’ can be misleading and misused.

The current wording:
“Ecological thinning may be carried out where required for ecological or management purposes, for example, subject to clearly defined, transparent and scientifically supported objectives, to restore ecosystems or to return them to a condition more closely resembling their natural condition.”

The term “Ecological thinning” is widely used in forestry and as silvicultural method. It purpose is significant different from the idea of undertaking ecological restoration as a “clearly defined, transparent and scientifically supported objectives, to restore ecosystems or to return them to a condition more closely resembling their natural condition”.

In our view, the use of the term ‘ecological thinning’ is confusing and will (as it has in the past, e.g. Red Gum thinning trials) lead to perverse outcomes in management of conservation areas, that is being used for forestry purpose as opposed to seeking eco achieve ecological restoration outcomes.

Ideally the practice of removing wood/biomass from the forest, should be link to by name to the ecological objective. For example if it’s purpose is to create hollows, perhaps “hollow enhancement” is a better frame, or if understory improvement is the aim “understory restoration” is better term, which clearly articulates the purpose.

<table>
<thead>
<tr>
<th>General recommendations for conservation parks</th>
</tr>
</thead>
<tbody>
<tr>
<td>B That conservation parks shown on map D (numbered B1 and B2) and described in chapter 7:</td>
</tr>
<tr>
<td>(a) be used to:</td>
</tr>
<tr>
<td>(i) permanently protect and restore the natural environment and natural biodiversity</td>
</tr>
<tr>
<td>(ii) protect features of natural, cultural or scientific interest</td>
</tr>
</tbody>
</table>

Agree, with changes

Largely agree, with changes to footnote 3, regarding ecological thinning (as per comments on General recommendation A).

Clarification required around status of mining and exploration leases.

Management plans should be required and specified for all these reserves.
(iii) protect the rights and interests of Traditional Owners, native title holders and Aboriginal Victorians, and their cultural values
(iv) enable public recreational and educational use consistent with conserving those values and features above;
(b) generally permit the following activities: (i) bushwalking, nature observation, heritage appreciation, picnicking (ii) camping in designated campgrounds and other areas specified by the land manager (see note 1) (iii) car touring, including four wheel driving, on formed roads and vehicle tracks (iv) trail bike riding on formed roads and vehicle tracks (v) mountain bike riding and cycling, and on other tracks and paths specified by the land manager (vi) horse riding on formed roads and tracks specified by the land manager (see note 2) (vii) recreational fishing (viii) apiculture at existing licensed sites (ix) research, subject to permit;
(c) exclude the following activities: (i) harvesting of forest products, including firewood collection (see note 3) (ii) grazing by domestic stock (iii) recreational hunting and use of firearms (see note 4) (iv) dog walking, except as specified by the land manager (see note 5); (d) include unused road reserves adjoining parks where appropriate; and (e) be added to Schedule 3 to the National Parks Act 1975.

<table>
<thead>
<tr>
<th><strong>General recommendations for regional parks</strong> (see note 1)</th>
<th>Agree, with additions</th>
<th>Regional parks should have the requirement of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The term “forest products” should be clearly defined.</td>
<td>• A well-resourced management and ecological restoration plan created to deal with the impacts of historical logging, pest plant and animals, and climate change;</td>
</tr>
</tbody>
</table>
A management plan for each park to manage allowable uses and avoid conflict, and include a long-term strategy for domestic firewood collection.

| General recommendations for nature reserves | Agree |
| General recommendations for bushland reserves | Agree |
| General recommendations for historic reserves | Agree |
| **General recommendations for state forests** | Agree in principle, but disagree with area designated. |

That state forests shown on map D (numbered G1 to G5) and described in chapter 5:

(a) be used to:
(i) provide for ecologically sustainable production of hardwood timber and other forest products
(ii) supply water and protect catchments and streams (iii) protect natural biodiversity, scenic and landscape values, and historic cultural values
(iv) protect the rights and interests of Traditional Owners, native title holders and Aboriginal Victorians, and their cultural values
(v) provide for public recreational and educational uses where this does not conflict with the above

(b) generally permit the following activities: (i) harvesting of forest products, including domestic firewood collection where identified by the land manager (ii) bushwalking, nature observation, heritage appreciation, picnicking (iii) camping including dispersed camping (iv) car touring, including four wheel driving, on formed roads and vehicle tracks (v) trail bike riding on formed roads and vehicle tracks (vi) mountain bike riding and cycling on formed roads and vehicle tracks, and on other tracks and paths specified by the land manager

There is no evidence provided to show that existing timber extraction levels are “ecological sustainable”, for Mt Cole or any other reserves. As discussed in Section 2.2, the current levels of timber harvest are above reported sustainable harvest limits and impact on. Intensive logging is not consistent with protecting catchment and streams and a whole range of ecological and recreation values.
(vii) horse riding on formed roads and tracks and overnight camping with horses  
(viii) dog walking and overnight camping with dogs  
(ix) recreational hunting and use of firearms  
(x) recreational fishing  
(xi) metal detecting and prospecting  
(xii) apiculture at existing licensed sites  
(xiii) grazing by domestic stock  
(xiv) mineral exploration and mining  
(xv) extraction of gravel, sand, or road-making materials  
(xvi) research, subject to permit.

<table>
<thead>
<tr>
<th>General recommendations for water frontage, beds and banks reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>H That water frontage, beds and banks reserves shown on map D:</td>
</tr>
<tr>
<td>(a) be used to:</td>
</tr>
<tr>
<td>(i) protect and restore native vegetation and habitat for native fauna</td>
</tr>
<tr>
<td>(ii) protect adjoining land from erosion, and provide for flood passage</td>
</tr>
<tr>
<td>(iii) protect water quality</td>
</tr>
<tr>
<td>(iv) where necessary provide for the passage of artificial flows of water stored within the catchment or transferred from other catchments</td>
</tr>
<tr>
<td>(v) protect scenic and landscape values, and historic cultural values</td>
</tr>
<tr>
<td>(vi) protect the rights and interests of Traditional Owners, native title holders and Aboriginal Victorians, and their cultural values</td>
</tr>
<tr>
<td>(vii) provide opportunities for public recreational and educational uses</td>
</tr>
<tr>
<td>(b) generally permit the following activities at a level that does not conflict with</td>
</tr>
</tbody>
</table>

Agreed, detail added.

There is a significant and successful government program for Riparian Land https://www.water.vic.gov.au/waterways-and-catchments/regional-riparian-action-plan which includes specific priorities for waterways in the investigation area, but this is not mentioned in the Draft Report.

We also note that public access to riparian areas managed by adjoining landholders is also often contentious, with farmers. (General recommendation H (b) (iii).

VEAC should consider these priorities area in detail when framing the recommendations (R9) and (R10) and General recommendation (H).

Areas considered priorities and overlapping with the investigation area include:
Mt Cole area - Fiery creek  
Wombat Forest - Moorabool River  
Wombat Forest – Little Coliban and Coliban river  
(a): (i) grazing by domestic stock  
(ii) recreational hunting of game species where appropriate  
(iii) where a Riparian Conservation Licence has been issued for a Crown land frontage, recreational use by the public for activities such as walking, nature observation or fishing  
(iv) sand and gravel extraction where this is consistent with (a) above, and where necessary for bed and bank stability.  
(c) programs to gradually restore frontages on currently grazed, degraded, eroded or salt-affected streambanks, where frontage vegetation is degraded or not regenerating and to protect natural, cultural, recreational and scenic values or water quality be implemented by catchment management authorities, in cooperation with adjoining landholders.  
(d) water frontage, beds and banks reserves be managed by the relevant catchment management authority and the Department of Environment, Land, Water and Planning.

<table>
<thead>
<tr>
<th>General recommendations for water production reserves</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>General recommendations for community use reserves</td>
<td>Agree</td>
</tr>
<tr>
<td>General recommendations for utilities and government services reserves</td>
<td>Agree</td>
</tr>
<tr>
<td>General recommendations for uncategorised public land</td>
<td>Agree</td>
</tr>
<tr>
<td>General recommendations for land leased or licensed for plantations, and plantations M</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

That plantations shown on map D continue under present use and management.

More detail about the exact nature of leased and licenced plantations, would be useful, for key blocks in the investigation area. Some of the plantation areas form key habitat linkages. While most are likely pine plantations, the question about their potential role as:
- Habitat corridors, in full or in part, especially when harvesting has occurred and are being replanted
- Opportunities for use of all or parts as community fire woodlots, for fast growing species such as Sugar Gum
- Park consolidation
- Protection of riparian and water zones
The handing over of public land for private plantations was highly controversial when it occurred in the 1990’s and opportunities should be considered for a more strategic approach.

Blocks which could include important connectivity include:
- West of Mount Macedon between proposed Wombat Regional Park
- West of Koweinguboora, between Ballan- Daylesford Rd and, proposed Wombat Lederderg National Park
- Two blocks adjacent Hepburn Regional Park
- Link between Mt Cole and Mt Lonarch and proposed Ben Major Nature Conservation Reserve. This includes parts of Fiery Creek and Avoca River headwaters

<table>
<thead>
<tr>
<th>General recommendations for reference areas</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N That the following areas totalling 1202 hectares shown on map D (numbered N1 to N5) be used as reference areas proclaimed under the Reference Areas Act 1978: N1 Buangor (69 hectares) N2 Musk Creek (91 hectares) N3 Ruths Gully (261 hectares) N4 Ah Kows Gully (475 hectares) N5 Pyrete Range (306 hectares)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General recommendations for heritage rivers</th>
<th>Agree with additions</th>
</tr>
</thead>
<tbody>
<tr>
<td>O That the following area shown on map D be used as a heritage river area as described on Schedule 1 of the Heritage Rivers Act 1992. O1 Lederderg River Heritage Area (5166 hectares)</td>
<td>The head waters of the Wimmera River, around Mt Cole should be designated under the Heritage River Act.</td>
</tr>
</tbody>
</table>
## VNPA Comments on Draft VEAC Recommendations for Specific Blocks

<table>
<thead>
<tr>
<th>Block Description</th>
<th>VNPA Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mount Cole – Pyrenees block</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **A1 Mount Buangor National Park**  
That the area of 3904 hectares shown on map D be used in accordance with the general recommendations for national parks on page 63. | Agree in principle  
Most of Mount Cole, recommended to stay in state forest would be left open to intensive logging. National Park should be extended to incorporate and protect the high natural and recreational values of Mount Cole. See Section 2: Revised reserve design for Mount Cole. |
| **A2 Pyrenees National Park**  
That: (a) the area of 16,076 hectares shown on map D be used in accordance with the general recommendations for national parks on page 63 and (b) domestic firewood collection cease after the current domestic firewood coupes are completed. | Agree  
Great to see the national park incorporates some of the highest values of the Pyrenees. |
| **C1 Pyrenees Regional Park** That:  
(a) the area of 4160 hectares shown on map D be used in accordance with the general recommendations for regional parks on page 67  
(b) low intensity harvesting of minor forest produce be allowed, and  
(c) domestic firewood collection be allowed in areas identified by the land manager in consultation with DELWP. | Agree  
The regional park is well designed to incorporate key prospecting areas |
| **D1 Lexton Nature Reserve**  
That the area of 260 hectares shown on map D continue to be used in accordance with the general recommendations for nature reserves on page 69. | Agree |
| **D2 Ben Nevis Nature Reserve** | Disagree  
Although extra protection is welcome, a nature reserve doesn’t go far enough to protect Mount Cole’s unique and significant ecological features. Further protection is recommended in National Park under the National Parks Act 1975 ideally, or for multi- |
That the area of 1088 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.

d3 Moonambel South Nature Reserve
That the area of 53 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.

D4 Tanwood South Nature Reserve
That the area of five hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.

D5 Ben Major Nature Reserve
That the area of 3229 hectares shown on map D including additions totalling 2409 hectares be used in accordance with the general recommendations for nature reserves on page 69.

D6 Waterloo Nature Reserve
That the area of 1695 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.

D7 Rosyth South Nature Reserve
That the area of 13 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.

E1 – E30 Bushland reserves
That the areas totalling 572 hectares shown on map D continue to be used in accordance with the general recommendations for bushland reserves on page 71.

E31 – E48 Bushland reserves
That the areas totalling 1081 hectares shown on map D be used in accordance with the general recommendations for bushland reserves on page 71.

Additional areas including Musical Gully, Camp Hill, Trawalla and Glenmora forests should be considered for reviewed as bushland reserves to protect catchment and biodiversity values.

F1 – F4 Historic reserves

Agree
<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Decision</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1 – G5 State forest</td>
<td>Disagree</td>
<td>Mount Cole is worthy of extra protection due to its significant natural and recreation values such as the Wimmera Headwaters, endemic Mount Cole Grevillea, shortfall of Herb-rich foothill forests in the investigation area, Montane Plateau, Beeripmo walk and others, all left open to intensive logging. Mount Cole should be given protection as a National Park under the <em>National Parks Act 1975</em> or alternatively additionally complemented by an adjoining regional park to accommodate more intensive recreational values. See Section 2: Revised reserve design for Mount Cole.</td>
</tr>
<tr>
<td>G 2, 3, 5 - Musical Gully, Camp Hill, Trawalla and Glenmora forests</td>
<td>Agree</td>
<td>These forests should be considered for review as bushland reserves to protect catchment and biodiversity values.</td>
</tr>
<tr>
<td>H Water frontage, beds and banks reserves</td>
<td>Agree</td>
<td>See commentary from general Recommendation H.</td>
</tr>
<tr>
<td>I Water production reserves</td>
<td>Agree</td>
<td></td>
</tr>
<tr>
<td>J Community use reserves</td>
<td>Agree</td>
<td></td>
</tr>
<tr>
<td>K Utilities and government services reserves</td>
<td>Agree</td>
<td></td>
</tr>
</tbody>
</table>
recommendations for utilities and government services reserves on page 80.

**L Uncategorised public land**
That the existing uncategorised public land shown on map D continue to be used in accordance with the general recommendations for uncategorised public land on page 81.

<table>
<thead>
<tr>
<th>VNPA position (agree/disagree)</th>
<th>VNPA comments</th>
</tr>
</thead>
</table>
| Agree                         | More detail about the exact nature of leased and licenced plantations, would be useful, for key blocks in the investigation area. Some of the plantation areas form key habitat linkages. While most are likely pine plantations, the question about their potential role as:
  - Habitat corridors, in full or in part, especially when harvesting has occurred and are being replanted
  - Opportunities for use of all or parts as community fire woodlots, for fast growing species such as Sugar Gum
  - Park consolidation
  - Protection of riparian and water zones

The handing over of public land for private plantations was highly controversial when it occurred in the 1990's and opportunities should be considered for a more strategic approach.

This block could include important connectivity as a link between Mt Cole and Mt Lonarch and proposed Ben Major Nature Conservation Reserve. This includes parts of Fiery Creek and Avoca River headwaters. |

**M Plantations**
That the existing plantations shown on map D continue to be used in accordance with the general recommendations for plantations on page 82.

<table>
<thead>
<tr>
<th>VNPA position (agree/disagree)</th>
<th>VNPA comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
</tr>
</tbody>
</table>
|                               | More detail about the exact nature of leased and licenced plantations, would be useful, for key blocks in the investigation area. Some of the plantation areas form key habitat linkages. While most are likely pine plantations, the question about their potential role as:
  - Habitat corridors, in full or in part, especially when harvesting has occurred and are being replanted
  - Opportunities for use of all or parts as community fire woodlots, for fast growing species such as Sugar Gum
  - Park consolidation
  - Protection of riparian and water zones

The handing over of public land for private plantations was highly controversial when it occurred in the 1990's and opportunities should be considered for a more strategic approach.

This block could include important connectivity as a link between Mt Cole and Mt Lonarch and proposed Ben Major Nature Conservation Reserve. This includes parts of Fiery Creek and Avoca River headwaters. |

**Wellsford Block**

<table>
<thead>
<tr>
<th>VNPA position (agree/disagree)</th>
<th>VNPA comments</th>
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</thead>
<tbody>
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</table>

**C2 Bendigo Regional Park** (addition)
That (a) the area of 3950 hectares shown on map D be added to the existing Bendigo Regional Park beyond the investigation area and be used in accordance with the general recommendations for regional parks on page 67 and (b) domestic firewood collection be allowed in areas where this will promote the growth of large trees and improve

<table>
<thead>
<tr>
<th>VNPA position (agree/disagree)</th>
<th>VNPA comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree in principle</td>
<td>Local groups have been advocating for section of Wellsford forest to be included as a national park under the <em>National Parks Act 1975</em>, and should be considered.</td>
</tr>
</tbody>
</table>
ecological condition, but not be extended to existing parts of the Bendigo Regional Park beyond the Central West Investigation area.

<table>
<thead>
<tr>
<th>D8 Wellsford Nature Reserve</th>
<th>Agree in principle</th>
<th>Local groups have been advocating for section of Wellsford forest to be included as a national park under the <em>National Parks Act 1975</em> which should be considered.</th>
</tr>
</thead>
<tbody>
<tr>
<td>That the area of 3160 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M Utilities and government services reserves</th>
<th>Agree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>That the utilities and government services reserves shown on map D be used in accordance with the general recommendations for utilities and government services reserves on page 80.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wombat- Macedon Block</th>
<th>VNPA position (agree/disagree)</th>
<th>VNPA comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3 Wombat–Lerderderg National Park</td>
<td>Agree</td>
<td>Increased protection for Wombat in national and regional park is greatly supported with Wombats forests significantly protecting headwaters of 7 rivers, 99 rare or threatened species, many recent records of the threatened brush-tailed phascogale, good numbers of greater glider, and many other rare species. There should be a well-resourced ecological restoration plan created for the Wombat Forest to deal with the impacts of historical logging, and potential impacts of climate change.</td>
</tr>
<tr>
<td>That the area of 52,853 hectares shown on map D including additions of 28,629 hectares to the existing Lerderderg State Park be used in accordance with the general recommendations for national parks on page 63.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B1 Hepburn Conservation Park</th>
<th>Agree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>That the area of 2714 hectares shown on map D be used in accordance with the general recommendations for conservation parks on page 65.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B2 Cobaw Conservation Park</th>
<th>Agree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>That the area of 2532 hectares shown on map D be used in accordance with the general recommendations for conservation parks on page 65.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C3 Hepburn Regional Park</th>
<th>Agree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>That the area of 4162 hectares including additions totalling 740 hectares shown on map D be used in accordance with</td>
<td></td>
<td>There should be a well-resourced ecological restoration plan created for the Wombat Forest to deal with the impacts of historical logging, and potential impacts of climate change.</td>
</tr>
</tbody>
</table>
the general recommendations for regional parks on page 67 and the joint management plan for the Dja Dja Wurrung appointed land.

- There should be the requirement for the regional park to have a management plan to manage allowable uses and avoid conflict.  
- In the regional park, there should be a long-term strategy for domestic firewood collection.

### C4 Wombat Regional Park
That the area of 9149 hectares shown on map D (located in two parts) be used in accordance with the general recommendations for regional parks on page 67.

- There should be a well-resourced ecological restoration plan created for the Wombat Forest to deal with the impacts of historical logging, and potential impacts of climate change.
- There should be the requirement for the regional park to have a management plan to manage allowable uses and avoid conflict.  
- In the regional park, there should be a long-term strategy for domestic firewood collection.

### C5 Macedon Regional Park
That:
(a) the area of 2134 hectares shown on map D including additions of 14 hectares be used in accordance with the general recommendations for regional parks on page 67, and 
(b) 139 hectares of pine plantations be added to the regional park once harvesting has been completed and the lease expires in 2020, and 
(c) by March 2021, a management plan be prepared in the context of other key sites in the area.

### D9 – D14 Existing nature reserves
That the areas totalling 570 hectares shown on map D continue to be used in accordance with the general recommendations for nature reserves on page 69.

### D15 Tylden Nature Reserve
That the area of 243 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.

### D16 Black Forest Nature Reserve
That the area of 262 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69.

### D17 Lerderderg River Nature Reserve
Agree
<table>
<thead>
<tr>
<th>Area Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>That: (a) the area of 4.7 hectares shown on map D be used in accordance with the general recommendations for nature reserves on page 69 (b) grazing not be permitted (c) infrastructure related to the current water extraction and pumphouse be accommodated.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>D18 Long Forest Nature Reserve</strong> That the area of 620 hectares, including the additional area of 25 hectares, shown on map D, be used in accordance with the general recommendations for nature reserves on page 69.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>E49 – E87 Existing bushland reserves</strong> That the areas totalling 475 hectares shown on map D be used in accordance with the general recommendations for bushland reserves on page 71.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>E88 Bungal Bushland Reserve</strong> That the area of 679 hectares shown on map D be used in accordance with the general recommendations for bushland reserves on page 71.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>F5 – F13 Historic reserves</strong> That the existing historic reserves shown on map D continue to be used in accordance with the general recommendations for historic reserves on page 73.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>H Water frontage, beds and banks reserves</strong> That the existing water frontage, beds and banks reserves shown on map D and on inset maps G, H, I and J continue to be used in accordance with the general recommendations for water frontage, beds and banks reserves on page 77.</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>I Water production reserves</strong> That the existing water production reserves shown on map D and on inset maps H, I and J continue to be used in</td>
<td>Agree</td>
</tr>
</tbody>
</table>
accordance with the general recommendations for water production reserves on page 78.

<table>
<thead>
<tr>
<th>J Community use reserves</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>That the existing community use reserves shown on map D and inset maps G, H, I and J continue to be used in accordance with the general recommendations for community use reserves on page 79.</td>
<td></td>
</tr>
</tbody>
</table>

K Utilities and government services reserves That the existing utilities and government services reserves shown on map D and inset maps G, H, I and J continue to be used in accordance with the general recommendations for utilities and government services reserves on page 80.

| Agree |

L Uncategorised public land That the existing uncategorised public land shown on map D and inset maps G, H, I and J continue to be used in accordance with the general recommendations for uncategorised public land on page 81.

| Agree |

L1 Uncategorised public land That the areas totalling approximately 100 hectares shown on map D be used in accordance with the general recommendations for uncategorised public land on page 81.

| Agree |

M Plantations That the existing plantations shown on map D continue to be used in accordance with the general recommendations for plantations on page 82.

| Disagree |
| More detail about the exact nature of leased and licenced plantations, would be useful, for key blocks in the investigation area. Some of the plantation areas form key habitat linkages. While most are likely pine plantations, the question about their potential role as:
- Habitat corridors, in full or in part, especially when harvesting has occurred and are being replanted
- Opportunities for use of all or parts as community firewoodlots, for fast growing species such as Sugar Gum
- Park consolidation
- Protection of riparian and water zones |
The handing over of public land for private plantations was highly controversial when it occurred in the 1990’s and opportunities should be considered for a more strategic approach.

Blocks which could include important connectivity include:
- West of Mount Macedon between proposed Wombat Regional Park
- West of Koweinguboora, between Ballan- Daylesford Rd and, proposed Wombat Lederderg National Park
- Two blocks adjacent Hepburn Regional Park

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CAUGHT ON CAMERA

Citizen science in the Wombat State Forest

FINAL DRAFT

A REPORT ON THE FIRST FIVE YEARS OF MONITORING THE EFFECTS OF FIRE ON WILDLIFE

Prepared by Christine Connelly, Richard Loyn, Caitlin Griffith, Dr Sera Blair
Victorian National Parks Association

The Victorian National Parks Association is a community-led nature conservation organisation. Our vision is to ensure Victoria is a place with a diverse and healthy natural environment that is protected, respected and enjoyed by all.

We work with all levels of government, the scientific community and the general community to achieve long term, best practice environmental outcomes and help shape the agenda for creating and managing national parks, conservation reserves and other important natural areas across land and sea in Victoria.

We are also Victoria's largest bushwalking club and provide a range of education, citizen science and activity programs that encourage Victorians to get active for nature.

NatureWatch

The Victorian National Parks Association's NatureWatch program is a citizen science program which gets community involved in collecting scientific data on Victorian native plants and animals. The program builds links between community members, scientists and land managers and develops scientifically based, practical projects which contribute to a better understanding of species and ecosystems, and the management of natural areas.

Project Partners

Wombat Forestcare

Wombat Forestcare is a community group dedicated to protecting and enhancing the natural ecosystems of the Wombat State Forest and surrounding areas.

Eco Insights

Eco Insights is a consultancy established by Richard Loin that conducts strategic projects in Australia and Papua New Guinea. Richard is an ecologist with special interests in forests, fire, wetlands, threatened species, bird migration and conservation.
Acknowledgements

NatureWatch and the Caught on Camera project would not exist without the tremendous amount of work of many volunteers who have been involved in helping establish the project, setting up cameras, maintaining equipment, team leading, identifying wildlife in images and data management.

Over the first five years of the project, each year around 45 volunteers contributed over 1,500 hours in the field, over 1,000 hours in the office identifying images and managing equipment and countless hours on other behind the scenes tasks.

Wombat Forestcare input and support, Gayle Osborne, Eddie Schambre and several others.

DELWP input and support, Matt Chick, Robin Holmes, Kerryn McTaggart and Sarah Bellhouse.

ARI input into project development, Matt Bruce, Peter Menkhorst and Richard Loin.

EcoInsights project scientific support, Richard Loin.

Victorian National Parks Association volunteer team leaders, office volunteers and field volunteers.

Project supported by: Since 2012, the project has received funding from the Foundation for National Parks and Wildlife, the ANZ Staff Foundation, Lord Mayor’s Charitable Foundation, Field Naturalists Club of Victoria Environment Fund, Perpetual Rowe Family Foundation.

Caught on Camera is supported by the Victorian Government.

This project is conducted with full ethics approvals and under DELWP Research Permit #10007466.
Summary

Between 2012 and 2016 more than 200 volunteers contributed over 2,500 hours to monitor wildlife in Wombat State Forest as part of the Caught on Camera project. Thanks to the inspiring volunteer effort, the community amassed five years of data on 13 native mammals and 15 native birds, including threatened species. This is part of a 10 year project and this report marks our findings at the halfway mark.

Back in 2012, Wombat Forestcare and the VNPA were concerned that we did not know enough about the effects of fire on wildlife. So, with the support of the Department of Environment, Land Water and Planning’s Arthur Rylah institute for Environmental Research (ARI), we set about devising a method to explore the question; ‘what is the impact of fire on mammals?’ through the VNPA’s NatureWatch program.

A project for the wider community

Caught on Camera has been a major achievement for the local and wider community.

Through the project, we’ve built and strengthened positive and long-lasting links between the community, scientists and the government.

The community came together to develop and deliver this project over the past five years, with volunteers from Wombat Forestcare and VNPA being involved in:

- Establishing the project science and methods
- Reviewing project progress
- Setting up and packing down cameras 100 times at 44 different monitoring sites
- Habitat assessments
- Sending in recorded data
- Maintaining equipment
- Leading teams in the field
- Identifying wildlife in many thousands of images
- Overview of final reports

The participation of the community in this project demonstrates a great passion for science and conservation in Wombat State Forest.

We’re incredibly grateful to everyone that has contributed to the project to date and we look forward to working with new and old friends to complete our ambitious and valuable 10-year study.

What have we found?

The community effort on this project has amassed five years of records that document 13 native mammal species and 15 native bird species, including:

**Mammals:**
- Echidna
- Brush-tailed Phascogale
- Agile Antechinus
- Dusky Antechinus
- Common Brushtail Possum
- Mountain Brushtail Possum
- Common Ringtail Possum
- Koala
- Common Wombat
- Black Wallaby
- Eastern Grey Kangaroo
- Bush Rat
- Swamp Rat

**Birds:**
- Southern Boobook
- Laughing Kookaburra
- Crimson Rosella
- Superb Fairy-wren
- White-browed Scrubwren
- Spotted Quail-thrush
- Grey Shrike-thrush
- Grey Currawong
- Pied Currawong
- Australian Magpie
- White-winged Chough
- Scarlet Robin
- Flame Robin
- Eastern Yellow Robin
- Bassian Thrush
We have also recorded nine introduced mammal species and one introduced bird species:

- Common Blackbird
- Black Rat
- House Mouse
- European Rabbit
- Brown Hare
- Feral Goat
- Sambar Deer
- Red Fox
- Cat
- Domestic Dog (with its human!)

Other recent studies in similar ecosystems have shown that longer-term effects of fire on flora and fauna are generally more subtle than those in the first three years. Our project appears to support this, at least for the common species. So far, there is no evidence of a dramatic response for any species, and several species have shown only subtle responses.

We don’t have a lot of data on the less common species but to date our results appear to show that common ground-dwelling mammal and bird species in the two forest types remained common over the study period.

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**Brush-tailed Phascogales:**

**an exciting find of a threatened species!**

Capturing images of a threatened Brush-tailed Phascogale (*Phascogale tapoatafa*) is an incredibly exciting outcome for this project. They are a small marsupials with a distinctive bottle-brush tail that live in dry leafy forests and nest in tree hollows and feed on insects and nectars. Being photographed at three sites across the Wombat State Forest demonstrates this is an important habitat area for this species which is listed as threatened under the Flora and Fauna Guarantee Act (1988).

A few months before these images were taken, Wombat Forestcare picked up the species on some of their cameras – these were the first recordings of the species in this part of the Wombat State Forest since the 1970’s!
INTRODUCTION

Caught on Camera project

Caught on Camera is an ongoing project that involves working with local community groups, land managers and scientists to establish long-term wildlife monitoring, using motion-sensing cameras. Field deployment of the cameras and management of equipment is undertaken by local community volunteers, with support of volunteers from elsewhere in Victoria, recruited through the VNPA.

In Wombat State Forest and Bunyip State Park, Caught on Camera involves looking at the long-term impact of fire on wildlife. In the Hindmarsh/Wimmera region and at Bank Australia’s conservation reserves, we explored the value of revegetation efforts for wildlife.

In other locations we are carrying out exploratory surveys, especially where contemporary survey data are lacking.

Project aims

The Caught on Camera project objectives in Wombat State Forest are:

- To provide crucial data on the long-term impacts of prescribed burning on wildlife to land managers, community groups, scientists and government.
- To create working partnerships with government, researchers and community, to carry out long-term monitoring.
- To demonstrate and promote to government the need for ongoing, strategic and comprehensive monitoring in response to fire.

We specifically designed the project to explore the question:

‘What mammal species are located at ‘Recently Burnt’, ‘Medium time since burnt’ and ‘Long Unburnt’ sites in Foothills Forest and Forby Forest in Wombat State Forest?’

This original aim remains, although we have refined our project slightly since we started. We have extended the study to look at fire response in a broader range of species, including some ground-foraging birds, and to increase the number of sites in each vegetation type and time since fire category.

This report

This report presents the results of the first five years’ of monitoring, and provides recommendations for the ongoing monitoring.
BACKGROUND

The importance of understanding the fire response

"Much monitoring of fauna is of such a small scale and short duration that the statistical likelihood of detecting a positive or negative effect of the management regime is minute. Such shortcomings will only be overcome through broad-scale and/or long-term studies of fauna." (Clarke 2008)

In Australia, we have a limited understanding of the impacts of fire on our biodiversity particularly the impacts on fauna (Clarke 2008, Mac-Hunter et al. 2009). We need repeatable, ongoing monitoring or there will continue to be gaps in our understanding of the impacts of planned burning in the landscape.

For land managers to improve planned burning techniques, particularly to meet the needs of our native fauna, it is essential to understand the impact of fire on all life forms, not just the impacts on the plants. This is particularly relevant when working in a fragmented landscape, such as Victoria.

"The ability of fire planners to meaningfully implement the dual aspirations of protecting life and property and achieving ecological goals is dependent on the availability of science and evidence that informs operational processes, and monitoring that influences future management." (Mac-Hunter et al. 2009)

Through long term community-driven projects that are developed with scientific rigour and linked to management techniques, such as planned burning, it is possible for the community to contribute to building our knowledge base on the impact of fire on fauna.

Why use motion-sensing cameras?

Monitoring of fauna using traditional survey techniques (e.g. trapping, spotlighting) can be highly labour intensive. Motion-sensing cameras provide an alternative method, and the opportunity to gather data on some animal groups (e.g. small mammals, some arboreal mammals and ground-foraging birds) with much less effort.

Cameras can be set-up at multiple locations and left to automatically detect and record species throughout the day and night. The method is also much less stressful for the fauna than trapping and can provide data on the presence of some species that are unlikely to be caught in traps.

It’s important to note that motion-sensing cameras do not provide accurate data on population sizes (except in rare cases when individual animals can be recognised) but may have potential to provide data on relative abundance across different habitats.

Motion-sensing cameras also offer a terrific opportunity for community engagement — the photographs of animals ‘Caught on Camera’ in their natural environment can be shared throughout the community as well as to a wider audience online. This can serve as an educational tool and inform the community about the richness of their local environment, fostering a more meaningful relationship between the community and the place in which they live.

Monitoring in Wombat State Forest

Since 2012, annual monitoring took place over March to July at up to 20 sites each year. The monitoring season commences with a community training session in March, which includes deploying the cameras at the first four sites.

Throughout the monitoring season, eight cameras are rotated around the sites every three weeks, to ensure that every site is monitored once. Each deployment involves two teams of around 4-5 volunteers.

A 10-year endeavour

We established a one year trial, to test the study design and the community’s capacity to carry out the study, with a view to carrying out annual monitoring over the long-term (>10 years).

At the end of the year, we reported on our results and reviewed our success and decided that the project was successful and should continue. We established a strategic plan with planning and review actions to be undertaken at four yearly intervals.

In 2015, we conducted a detailed review of the project and determined that we are tracking well; the data were of good quality and the project should continue with minor adjustments.

Specifically, we determined that we should increase our sample size by adding more sites across the site categories, to improve our likelihood of detecting responses.
Methods

Study area

The study was conducted in Wombat State Forest in central-west Victoria, approximately 80 km north-west of central Melbourne. The forest covers about 70,000 ha and extends along both sides of the Great Dividing Range, from Creswick to Mount Macedon.

Wombat forest has a long history of timber harvesting, and was extensively logged during the gold rush era of the mid-1800s. Virtually all old-growth trees have been removed from the forest. Large-scale harvesting ceased in 2002 (Macak et al. 2010), but the forest continues to be managed under the Forests Act, thus mining and further logging activities cannot be ruled out.

The forest comprises a mixed eucalypt foothill forest with dominant Messmate (Eucalyptus obliqua) overstorey, in combination with Peppermints (E. dives and E. radiata) and Candlebark Gum (E. rubida) (Leversha 1996). Sixty per cent of the vegetation types that occur in the Wombat forest are classified as threatened.

The Wombat forest provides habitat for over 180 native vertebrate fauna species, including 18 rare or threatened species (e.g. Greater Glider, Powerful Owl, Square-tailed Kite, White-throated Needletail and Lace Monitor). The forest is also inhabited by several key fire response species such as Mountain Brush-tail Possum, Agile Antechinus and Black Wallaby (Macak et al. 2010; MacHunter et al. 2009).

Sites

From 2012 to 2015, 28 sites were established, a subset of 30 sites established by Wombat Forestcare and the Department of Sustainability and Environment as Community Research sites (Macak et al. 2010). In 2016, a further 16 sites were added to increase the statistical power of the study, providing greater capacity to detect trends in results.

The sites were selected to represent sites that have been burnt at different time intervals, which were classified into three 'time since fire' categories;

- recently burnt (RB: 0 - 10 years since the last fire),
- medium burnt (MB: 11 - 41 years since the last fire) and
- long unburnt (LU: 42+ years since the last fire).

Sites were located within two vegetation communities (ecological vegetation division categories for fire planning; EVDs); Foothills Forest and Forby Forest.

The project planning workshop provided a 10-year project plan to select 20 sites for monitoring each year. This could include some repeated sites and some new sites and result in up to 100 or more monitoring sites over the next 10 years.

Parameters for selecting monitoring sites:

- Include sites with planned burns in the subsequent 1-2 years (to collect pre-burn data and then monitor change).
- Sites in Forby Forest and Foothills Forest EVDs.
- Consider opportunities to address spatial distribution of burns in the landscape, and the patterns of burn intensity within each burn. Patchiness can be manipulated at both scales through the planning process and decisions about when to burn (weather on the day). Fine-scale patchiness can also be manipulated by decisions about ignition patterns.
- All sites are easily accessible (by 2WD vehicle and short walk).
- Sites are at least 1km apart.
- Design includes recently burnt sites (0-3 years since burn) if possible.
- If there is an interest or need identified in the future, sites in new EVCs can be included at a later stage.

So far, 44 sites have been selected and surveyed across the study area (Figure 1), with 28 monitored in the first four years and a further 16 surveyed in the fifth year covered by this report.
Figure 1. Map of the study sites within the Wombat State Forest and their time since fire category (green = long unburnt, blue = medium burnt, red = recently burnt).
Survey methods

Training

This is an ongoing community project and on-ground activities are carried out by community volunteers. Each year, coordination and training is led by the VNPA. The monitoring season starts in March and begins with a community training activity, to launch the project and train participants in how to set-up cameras.

Between 2012 and 2017, each annual training activity was attended by 25-50 eager participants, who were provided with project background, information about VNPA and Wombat Forestcare, visited several sites in Wombat forest and were trained in how to set-up bait stations and cameras.
Setting up monitoring sites

Following the training activity, community volunteers from VNPA and Wombat Forestcare volunteered every three weeks to pack down, move and set-up cameras and bait stations at the 20 sites monitored each year. A GPS and location description were used to navigate to each site. Two motion-sensing cameras (heat-in-motion type, Reconyx Hyperfire HC500) were installed at each site, approximately 100 m apart. Each camera was attached to the nearest suitable tree at the designated location and positioned 50 cm above the ground, facing south to avoid sun glare at sunrise and sunset.

The bait station comprised six stainless steel tea strainers, which were secured inside a small rectangular cage and attached to a plastic garden stake, as shown in Figure 2.

Figure 2. Camera and bait station field set-up

Small branch to direct vision (if required)

Wire securing camera casing

Python Lock

Camera  ~ 50cm from

Foreground clear of vegetation and clear 1m behind bait station

Bait Station  ~ 30-50cm from ground

Bait Station - 2—3m from tree
A bait station was placed 2-3 m in front of each camera with the base of the cage approximately 30 cm from the ground. The tea strainers were filled with a bait mixture of rolled oats, peanut butter and golden syrup, which were used to attract wildlife to the centre of the cameras' field of view.

The cameras were aligned so that the bait station appeared in the horizontal centre of the frame and the bottom of the bait cage was in the vertical centre of the frame. The vegetation between each camera and its bait station and one metre behind was cleared (within the field of view of the camera) to ensure that this did not obscure any photographs of animals.

The cameras were left to operate for a minimum of 21 days. Upon collection, cameras were checked to see if they were still operating.

**Species identification**

The species of wildlife in each photo taken by the cameras were identified and counted by volunteers under the supervision of the NatureWatch Coordinator. The images of wildlife which were difficult to identify were then sent to ARI or Eco Insights for further identification. Where possible, animals have been identified to species level. In cases where some doubt persisted they were assigned to a more generic category, for example "Unidentified Brushtail Possum".

**Habitat assessments**

At the first camera set-up at each site, habitat was assessed within a one hectare area centred on the cameras. Several habitat variables were recorded, to describe upper-, mid- and under-storey vegetation structure and to not any special features of the site. Key habitat features such as leaf litter or fallen logs were scored on a scale from 0 (absent) to 5 (very prevalent). Practice sessions helped ensure that this was estimated consistently by all assessors.

Four photographs of the habitat were taken from the locations where cameras were installed, using handheld digital cameras. The first is a photograph of the canopy, and the rest are horizontal photographs of the vegetation immediately surrounding the site.
Analysis

We calculated the number of days on which each species was identified (using means for the two cameras) for each site and year. This measurement is called a 'site-day'. We used this as a measure of the prevalence of that species on the site at that time, or the intensity with which the species was using the site. We then assessed any relationships between this prevalence measure for each species and the following variables:

- The prevalence of other species.
- The habitat variables we recorded.
- The vegetation type (Ecological Vegetation Division; EVD).
- Fire history (number of recorded fires since 1970, and 'time since fire' as a numerical value of 'years').

We categorised the sites as recently burnt (3-14 years before the survey); medium-burnt (15-50 years before) or long-unburnt (no recorded fires for 50 years or more). This differs slightly from the original design (see pages 10-11), but it provided similar numbers of sites in each category. It happens that we did not survey any sites burnt less than three years before the survey, and we will attempt to include such very recently burnt sites in the future because some species are known to favour those early stages after fire.

We had planned to examine sites in a third EVD (Grassy/Heathy Dry Forest) but found too few sites for this to be useful. Hence, we focused mainly on Foothills Forest and Forby Forest. Two sites in Grassy/Heathy Dry Forest were analysed along with sites in Forby Forest, as some intermingling was found between those EVDs.

Table 1 shows the spread of sites across these 'time since fire' categories and the vegetation types. Because there is less Forby Forest in the Wombat forest, we located two sites within a similar EVD, 'Grassy/Heathy Dry Forest'.

<table>
<thead>
<tr>
<th>Ecological Vegetation Division</th>
<th>Total Sites</th>
<th>Recently Burnt</th>
<th>Medium Burnt</th>
<th>Long Unburnt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foothills Forest</td>
<td>29</td>
<td>7</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Forby or Grassy/Healthy Dry Forest</td>
<td>15</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>44</strong></td>
<td><strong>11</strong></td>
<td><strong>17</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

Statistical analyses were run to identify significant correlations and other more complex relationships with EVD and time since fire. Further statistical models will be developed in the future for selected species.
Results

What did we observe?

Altogether we recorded 23 mammal species and 16 bird species with the motion-sensing cameras. Black Wallabies were detected on all 44 sites and were recorded on more days than any other species. In terms of numbers of sites recorded, the next most common mammal species in descending order were Common Wombat (36 sites), Agile Antechinus (31), Red Fox (28), Mountain Brushtail Possum (26), Eastern Grey Kangaroo (22), and Bush Rat (18). All were native except for the Red Fox. Details in Table 2.

The same seven species also topped the list in terms of numbers of days detected, accounting for 74.2% of mammal site-days. The two small species in the group (Agile Antechinus and Bush Rat) were recorded on more days at each site than the larger species, reflecting their small home ranges and consequently higher density.
No other mammal species was recorded on more than 10 sites (Table 2). Black Rats appeared to be common on one of the three sites where they were recorded (WCR8, with Forby Forest last burnt in 2004) whereas other species were detected infrequently.

The species recorded were mainly ground-foragers, although Agile Antechinus also forage extensively in trees and five species feed mainly in trees (Brush-tailed Phascogale, Koala and the three possum species). No gliders or bats were recorded with the camera traps.

Of the 22 mammal species, 13 were native and nine were introduced to Australia. Introduced mammal species contributed 7.1% of the mammal site-days, showing that introduced mammals form only a modest component of the mammal fauna detected.

The most commonly detected bird species was the Superb Fairy-wren, and it was found on 20 sites, followed by the Grey Shrike-thrush at 18 sites (Table 2).
Table 2: Species prevalence represented by the number of sites they were recorded visiting, the percentage of total sites they visited and the mean number of days (site days) they were recorded at each site.

<table>
<thead>
<tr>
<th>Native mammals species</th>
<th>Mean number of site days</th>
<th>Number of sites recorded (n=44)</th>
<th>Percentage of sites visited (n=44)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Wallaby</td>
<td>3.94</td>
<td>44</td>
<td>100.0</td>
</tr>
<tr>
<td>Common Wombat</td>
<td>1.49</td>
<td>36</td>
<td>81.8</td>
</tr>
<tr>
<td>Agile Antechinus</td>
<td>1.76</td>
<td>31</td>
<td>70.5</td>
</tr>
<tr>
<td>Any Brushtail</td>
<td>0.96</td>
<td>29</td>
<td>65.9</td>
</tr>
<tr>
<td>Mountain Brushtail Possum</td>
<td>0.77</td>
<td>26</td>
<td>59.1</td>
</tr>
<tr>
<td>Eastern Grey Kangaroo</td>
<td>0.45</td>
<td>22</td>
<td>50.0</td>
</tr>
<tr>
<td>Bush Rat</td>
<td>0.79</td>
<td>18</td>
<td>40.9</td>
</tr>
<tr>
<td>Common Ringtail Possum</td>
<td>0.09</td>
<td>10</td>
<td>22.7</td>
</tr>
<tr>
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<td>6.8</td>
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<td>2</td>
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</tr>
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<tr>
<td>Common Blackbird</td>
<td>0.02</td>
<td>3</td>
<td>6.8</td>
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<td>Sambar or Deer sp.</td>
<td>0.01</td>
<td>2</td>
<td>4.5</td>
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<tr>
<td>Domestic Dog</td>
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<td>2</td>
<td>4.5</td>
</tr>
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<td>House Mouse</td>
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<td>4.5</td>
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<td>Brown Hare</td>
<td>0.03</td>
<td>2</td>
<td>4.5</td>
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<tr>
<td>Feral Goat</td>
<td>0.04</td>
<td>1</td>
<td>2.3</td>
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</tbody>
</table>

* Identification of some Common Brushtail Possum records requires further confirmation. Local observers consider it to be unlikely to be as prevalent as these data suggest.
All of the birds observed forage extensively from the ground or low vegetation, and most were classed as members of two guilds that take invertebrates from open ground or damp shady ground respectively.

Another common species (Grey Shrike-thrush) is classed as a general insectivore, which takes invertebrates and other food from a wide range of situations.

The only seed-eating bird recorded (Crimson Rosella) feeds mainly in the tree canopy but also from the ground or low plants.

Two carnivorous species (Laughing Kookaburra and Southern Boobook) feed mainly by pouncing on ground-dwelling prey though they may take prey from a range of situations.

Many bird species that feed from tall shrubs, tree trunks or the eucalypt canopy are known to be common in the forest, but were not detected with camera traps.

All bird species recorded, except Common Blackbird, were native species. Introduced species contributed 0.7% of the bird site-days, showing that introduced birds form a very small component of the bird fauna detected.

**Associations between animal species**

We found positive correlations between species that favour similar habitats, including Black Wallaby and Common Wombat; Agile Antechinus and Echidna; and Grey Shrike-thrush and Eastern Yellow Robin. These species all occupy a wide range of habitats but the first pair favours reasonably dense shrub cover and the other two pairs become most common where shrub cover is interspersed with areas of open ground. Dusky Antechinus were identified at two sites where Bassian Thrush was detected (WCR13 & 28), and both species have a general preference for forest gullies, damp or wet forest.

Birds that favour drier situations (e.g. White-winged Chough, Scarlet Robin and Spotted Quail-thrush) also showed positive correlations with each other, showing that they tended to favour similar sets of sites. Few negative correlations were found, suggesting that competition between species was not a major force in shaping the bird community in this forest.
Associations with habitat features

In terms of the designated EVD, two native species (Echidna and Spotted Quail-thrush) appeared to favour Grassy/Heathy Dry Forest or Forby Forest over Foothills Forest. Two introduced species (European Rabbit and Feral Cat) were also found more often in those EVDs.

Three of the uncommon native mammal species recorded were only found in Foothills Forest: these were Brush-tailed Phascogale, Swamp Rat and Dusky Antechinus. Fewer birds were recorded in the two sites containing Grassy/Heathy Dry Forest than in sites containing Forby Forest or Foothills Forest.

In general, the designated EVD explained only a small part of the variation in mammal and bird communities between sites. Mean numbers of site-days for each species in each EVD are shown in Table 3.

<table>
<thead>
<tr>
<th>Site EVD</th>
<th>Number of sites</th>
<th>Foothills Forest</th>
<th>Forby Forest or Grassy/Heathy</th>
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</thead>
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<td>0.10</td>
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</tr>
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<td>Brush-tailed Phascogale</td>
<td>0.05</td>
<td>0.00</td>
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<td>1.33</td>
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<tr>
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<td>0.00</td>
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<tr>
<td>Common Brushtail Possum</td>
<td>0.19</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
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<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Any Brushtail</td>
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<td>0.65</td>
<td></td>
</tr>
<tr>
<td>Common Ringtail Possum</td>
<td>0.11</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Koala</td>
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<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Common Wombat</td>
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<td>Crimson Rosella</td>
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<td>0.00</td>
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<td>0.15</td>
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<td>0.06</td>
<td></td>
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<tr>
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<tr>
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<td>0.17</td>
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<tr>
<td>Currawong sp.</td>
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<td>0.01</td>
<td></td>
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<tr>
<td>White-winged Chough</td>
<td>0.17</td>
<td>0.04</td>
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<td>Scarlet Robin</td>
<td>0.03</td>
<td>0.00</td>
<td></td>
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<tr>
<td>Flame Robin</td>
<td>0.00</td>
<td>0.05</td>
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<td>Eastern Yellow Robin</td>
<td>0.15</td>
<td>0.05</td>
<td></td>
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<tr>
<td>Bassian Thrush</td>
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<td>0.03</td>
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<tr>
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<td>0.01</td>
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<td>Cat</td>
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<td>Domestic Dog</td>
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<td></td>
</tr>
<tr>
<td>Common Blackbird</td>
<td>0.00</td>
<td>0.04</td>
<td></td>
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Correlations were evident with some of the measured habitat characteristics. For example, the abundance of tree-ferns was positively associated with Dusky Antechinus and Bassian Thrush. Sedges and Blackwood wattles were positively associated with Common Wombat and insectivorous birds that feed from damp ground (including White-browed Scrubwren and Eastern Yellow Robin).

The proportion of smooth-barked eucalypts (gums, mainly Candlebark) was positively correlated with Koala (which feeds preferentially from these species) and Mountain Brushtail Possum (which favours the damp habitats occupied by gums). The proportion of stringybarks (mainly Messmate) was negatively correlated with Mountain Brushtail Possum but positively with Agile Antechinus.

Numbers of Agile Antechinus correlated positively with the number of trees with dead tops, and negatively with the number of trees lacking that feature. Tree size and number of hollows correlated positively with total birds and several bird species.

Relationships with fire history

No species showed strong relationships with fire history, showing that most species can tolerate a range of fire regimes. However, weak relationships were found for some species (Table 4).

Four native species showed weak positive relationships with time since fire, suggesting a long process of recovery after an initial negative impact of fire. These were Echidna, Bush Rat, Grey Shrike-thrush and Superb Fairy-wren.

Two uncommon species were found mainly on sites that had not been burned for a long time: these were Dusky Antechinus and (more surprisingly) the introduced European Rabbit. Introduced House Mouse was only found in two sites (WCR4 and 19), both of which were long-unburnt.

The three records of Brush-tailed Phascogale were in Foothills Forest in each of the three time since fire categories (recently burnt, medium burnt, long unburnt).

---

1 Statistical significance for all tests: p < 0.1
Table 4: Mean number of site days for each species by fire history category.

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<th>Recently burnt</th>
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<tr>
<td>Brown Hare</td>
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<tr>
<td>Common Blackbird</td>
<td>0.02</td>
<td>0.00</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Trends over time

We surveyed 11 of the 44 sites every year from 2012 to 2015, which enables us to examine trends over time at these sites. Data from those sites are graphed in Figures 3-6 for four common native mammal species: along with most species, these were expected to demonstrate a response to fire.

Two of the 11 sites were classed as recently burnt: site WCR30 was burnt in 2009 (three years before our study began), and site WCR18 in 2005 (7 years). Three of the sites were classed as medium time since fire, having been burnt 10-50 years previously (WCR5, 14 & 23), and six were classed as long-unburnt (WCR3, 12, 19, 26, 28 & 29). It was expected that the recently burnt sites (especially WCR30) might show more evidence of successional change than the sites burnt longer ago. However, little support for that idea was found for these four species (Figures 3-6).

Nevertheless, some differences in response were evident:

- Black Wallabies appeared to increase over time on the most recently burnt site (WCR30) but remained more stable on the set of other sites (Figure 3).
- Common Wombats were initially more common on WCR30 than on other sets of sites, but decreased to average levels in the fourth year of the survey (Figure 3).
- Bush Rats were not recorded on WCR30 except in the third year of the survey (2014), and numbers fluctuated greatly in the other sets of sites (Figure 5).

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2 Further analysis is needed to assess the statistical significance of these results.
Figure 3: Black Wallaby relationship with fire history.

Figure 4: Common Wombat relationship with fire history.
Figure 5: Bush Rat relationship with fire history.

- Long unburnt
- Medium burnt
- WCR18 (2005)
- WCR30 (2009)

Figure 6: Agile Antechinus relationship with fire history.

- Agile Antechinus declined dramatically after the first year of the survey on both recently burnt sites, and on the set of three medium-burnt sites, but not on the set of six long-unburnt sites (Figure 6). A similar decline occurred on the long-unburnt sites the following year, with a partial recovery in 2015.
Discussion

A community achievement

This important study on the impacts of fire on wildlife in the Wombat State Forest is carried out almost entirely by volunteers. More than 45 volunteers each year contributed over 2,500 hours of work to amass five years of highly valuable data on mammals in Wombat State Forest.

The project has opened a new window on the ground-dwelling mammal fauna in the Wombat State Forest, and helps to improve our understanding of how different species may change over time, and respond to habitat and the way the habitat is managed.

Without this study we would have no contemporary data about the ground-dwelling mammal fauna in these forests in the decade following one of the longest droughts in recent history (1997-2009) and subsequent changes in policy relating to management of fire and logging.

The project has seen passionate community members, scientists and managers working together to increase our understanding of mammals in Wombat State Forest. The project has expanded the skills and knowledge of everyone involved.

Some of our participants, volunteers and community group leaders reflected on their learnings through an anonymous survey:

"Participation has broadened my knowledge and appreciation of local plants and animals and the habitats in which they live."

"Community members have a desire for ecological knowledge and their participation allows for the sharing of this knowledge."

We've also had some exciting and unexpected outcomes. Caught on Camera in Wombat State Forest was featured in French documentary, 'Nature's Keepers'. Representatives from VNPA and Wombat Forestcare were interviewed and the field deployment of the project was filmed to provide an international audience with an understanding of the project and our aims.

'Nature in the Dark' was a creative arts project that arose from the images we collected. Artists were provided with our wildlife images and re-worked and interpreted the original footage in their own way, with several artists' interpretations curated into a single piece that was projected at various venues.

According to the curators;

"Looking at the photos there is something incredibly intimate and unguarded about them. It's as if wildlife social-realism meets the monochromatic aesthetic of night vision surveillance and we are becoming voyeurs of another intelligence at work – which we would not have encountered otherwise." (Brüggemeier and Miranda 2012)

Understanding our results

Wombat State Forest has been subject to a long history of gold-mining, logging, wildfire and planned burns. Most of the 44 sites surveyed had been subject to some or all of these disturbances.

Fire causes substantial changes to fauna habitat, which are most marked in the first three years. Influxes of native species associated with open habitats are often seen after wildfire, and these may include introduced species such as House Mouse (Friend 1993) and native species such as Superb Fairy-wren, Scarlet Robin and White-browed Woodswallow (Loy 1997; Loy and McNabb 2015).

Smaller influxes may also occur after planned burns, as shown in various studies including some in the Wombat State Forest (Humphries 1994; Loy et al. 2003; Loy and McNabb 2015). The current study focused on longer-term effects, and we did not examine sites burnt less than three years before the surveys.
Some of the species that prosper in the first three years after fire (e.g. House Mouse, Superb Fairy-wren and Scarlet Robin) turned out to be more prevalent in long-unburnt forest than in younger age-classes. Other studies have shown that some of the mammals and birds that favour open stands in early stages after fire or logging may avoid the later stages where shrub cover may be dense, but become more prevalent as those stands open up again after many years (Loy 1997, 2004, 2012).

Recent studies in Victorian foothill forests have shown that longer-term effects of fire on flora and fauna are generally subtler than those in the first three years (Muir et al. 2015; Leonard et al. 2016; Kelly et al. 2017). The current project supports this conclusion, showing the response of the common ground-dwelling mammal and bird fauna in these forests.

The project has also shown that these forests continue to support some less common species, including the Brush-tailed Phascogale, which was formerly only known from the drier northern parts of Wombat State Forest. It is much harder to determine how they may be affected by current or future management of fire or anything else because of the low numbers we detected. However, it is reassuring that they can still be found in Wombat State Forest and continue to make use of widely distributed and less-threatened habitats including Foothills Forest.

Limitations and recommendations

Camera trapping has become a popular and valuable survey method, and refinements will continue to be made to the technology and the different ways of analysing data (e.g. Swann et al. 2004; Nelson and Scroggie 2009; Meek et al. 2014).

At present, the number of photographs does not provide a robust measure of species abundance, as individual animals may spend long and variable periods at the bait station on a single visit. Some ecologists have argued that quantitative conclusions cannot be made with camera-trap data unless individual animals are identified, but we believe that approach is too limited, and quantitative analyses of the sort we have undertaken can provide important information about the relative abundance of mammal species in different types of habitat. Analysis based on presence-absence would clearly be inadequate for common species such as Black Wallaby, which was recorded on every site but exhibited marked variation in prevalence between sites (different numbers of site-days).

As with any project, our study does not provide a complete picture, and there are some limitations with the field methods and with the exploratory analysis presented here. But, despite the limitations, this project has progressed our knowledge of fauna in Wombat State Forest. More complex statistical analyses will be needed to unlock the potential of this study to inform us about effects of habitat and fire management. The analyses reported here are exploratory, and more sophisticated approaches are possible (Robley et al. 2010; Gillespie et al. 2016) which we look forward to exploring in the future.

With the present data, it is clear that some species were detected much more often on some sites than others, in terms of numbers of photographs taken and numbers of days on which they were photographed. The number of days on which the species is detected is highly likely to reflect the relative abundance of that species on the site (for species with small home ranges), or the intensity of use that site (for species with large home ranges).
What’s next

At a workshop to develop our long-term project plan, attended by the project partners, we decided the best way to progress was to increase the number of sites by monitoring new sites each year. The benefits of this approach were identified as:

• Increase the statistical power of the project and capacity to answer the research question.

• Easily make it possible to include several of the following options:

  1. Adding monitoring of birds at existing sites.
  2. Adding monitoring in other vegetation types
  3. Setting up monitoring sites to monitor burn patterns at specific sites.
  4. Setting up monitoring at sites before and after fire.
  5. Gather more detailed habitat data.
  6. Include more ‘recently burnt’ sites (0-4 years since fire).

• Make it possible to analyse the data against different variables.

The following reporting will be undertaken:

1. Regular reporting back to community via social media and emails.

2. Reporting all feral and threatened species records to DELWP within a week of downloading data.

3. Reports every five years prepared for a mixed audience (scientists, land managers, community and volunteers) and published by VNPA.

4. Article for peer-reviewed science journal by around 2022 (including up to 10 years of data).

We’re committed to continue this project for at least ten years. We’re looking forward to a continued and lasting relationship between the community, scientists and government representatives involved in Caught on Camera in Wombat State Forest.

Back Wombat
References


References (cont.)


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WAKE UP TO THE WOMBAT – WOMBAT FOREST UNDER THREAT FROM MINING

Over 8000 hectares of Wombat State Forest and surrounding areas are under exploration licence, with applications for a further 15,000 hectares — any of which COULD become mining operations.

The Wombat forest near Daylesford is a natural gem that is now under threat from mining.

Mining licences are in place for over 400 hectares within the Wombat, including the recent licence for the open cut mine to start operations in Bullarto South.

The VNPA has recently learned that a mining licence at Bullarto South (MIN5349) gives the go-ahead for a gold mining operation in Wombat State Forest, 2km south of Bullarto township and in the headwaters of the heritage-listed Lerderderg River. While this news has sparked understandable community concern, it is just the tip of the iceberg.

UNDERMINING CENTRAL VICTORIA

There are two types of mining licence — exploration and mining — and both currently exist for large areas of the Wombat forest and surrounding areas.

Over 8000 hectares of Wombat State Forest and surrounding areas are under exploration licence, with applications for a further 15,000 hectares — and any of these have the potential to become mining operations.

Mining licences are in place for over 400 hectares within the Wombat, including the recent licence for the open cut mine to start operations in Bullarto South.

The VNPA and local groups are resolute: the Victorian government must never be allowed to hand over high conservation significant areas such as the Wombat State Forest to mining companies.

History shouldn’t repeat itself

Wombat State Forest covers about 45,100 hectares and is one of Central Victoria’s most important forests. With easy access from Ballarat, Daylesford, Trentham, Gisborne and Mount Macedon, it is one of Victoria’s truly special places.

This region of Victoria had a gold mining history, but there has been no mining within Wombat State Forest for many years.

As mining in the Wombat would involve clearing areas of forest and other vegetation, it raises significant issues about erosion, sedimentation and heavy metal contamination of the forest and its waterways. And with thousands of tonnes of material being hauled out for processing, a dramatic increase in the volume of trucks on the roads poses a number of serious safety issues.

Mining in high conservation value areas

Wombat forest is valued by locals and visitors alike and has been identified as rich in diversity of plant and animal species (many of which are threatened), and important for water quality in central Victoria.

In a detailed study of the area carried out in 2010, the VNPA identified the main areas of Wombat as having high conservation significance and are therefore worthy of better protection under the National Parks Act. More info can be found under Special Places on our website.

OPEN CUT MINE AT BULLARTO SOUTH

The four-hectare open cut mine in Bullarto South will involve a significant amount of clearing of high conservation significant native vegetation.

It has been approved without public consultation and both the mine owner and the Department of Primary Industries (DPI) failed to release details about the operation prior to the community hearing about it.

Recently over 350 concerned local people and local environment groups who oppose the gold mine attended a meeting at the Bullarto hall, and called for the mine to be stopped.

> See vnpa.org.au/page/nature-conservation/protecting-special-places/small-parks-project

> See www.wombatforestcare.org.au
The forest is home to threatened fauna, and recent records of native species that call the forest home include the Powerful Owl, Spotted Quail-thrush and Square-tailed Kite, the nationally endangered Spot-tailed Quoll, the nationally vulnerable Growing Grass Frog and the state endangered Masked Owl.

Also present are at least 20 rare and threatened plant species including the state-listed and endangered Small Sickle Greenhood (Pterostylis lustra) and the endemic Wombat Bush-pea (Pultenaea reflexifolia var. reflexifolia).

Some 70% of vegetation types within Wombat are underrepresented in parks within the Central Victorian Uplands bioregion, a fact that further highlights the need for better protection and conservation for these areas.

The southeast corner of Wombat State Forest, which adjoins Lerderderg State Park, has Sedgy Riparian Woodland and Damp Forest forming a transition to the dryer forests further north. Heritage-listed Lerderderg River meanders through state forest and the state park.

**Wombat in a nutshell**

- **Wombat State Forest** is a very important water catchment, containing the headwaters of six major river systems. The Moorabool, Werribee and Lerderderg Rivers flow to the south, and the Loddon, Coliban and Campaspe to the north.
- **It is** a regional biolink, providing crucial habitat for movement of species across the central Victorian landscape.
- **It is** a biodiversity hotspot.
- **It is** a valuable tourist destination for regional Victoria.
- **It is** important for recreation and amenity to local comities.
- **It supports** beekeeping.
- **It is** a valuable carbon store.
WAKE UP TO THE WOMBAT – WOMBAT FOREST UNDER THREAT FROM MINING

PUBLISHED: July 2012

WHAT NEEDS TO BE DONE
The potential environmental impacts of mining in state forests, include:
• Water contamination.
• Loss of habitat and biodiversity.
• Sedimentation of rivers within catchment areas.
• Increased heavy vehicle traffic requiring wider roads in forested areas.
• Impacts on the local community of increased heavy vehicles on minor roads.
• Loss of access to areas of public land under mining activity.

The VNPA is speaking out and calling for the following actions to be taken:

The VNPA believes that the Victorian Government should not allow a company exploit this important publicly owned natural area for mining.

We recommend that at the very least, Wombat State Forest should be protected under the National Parks Act as a State Park. This move would give greater protection to its natural values and safeguard it against mining.

The Victorian government should declare an immediate moratorium on all mining within the Wombat State Forest and similar high conservation areas.

The Victorian Government should instruct the Victorian Environmental Assessment Council (VEAC) to investigate and recommend future land use and boundaries for additional conservation reserves or parks for publicly owned forests across central Victoria.

We ask you to join us to send a clear message to the Baillieu Government to rule out mining in state forests and rescind the mining licence MIN5349 for mining in the Wombat State Forest.

HAVE YOUR SAY
To send a clear message to the Baillieu Government, write to State Minister for Energy and Resources Michael O’Brien. While you will want to add your own thoughts, you may wish to use some of the information we have given you here.

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ThREATENED FLORA & FAUNA OF WOMBAT FOREST
• Powerful Owl (pictured)
• Spotted Quail-thrush
• Square-tailed Kite
• Spot-tailed Quoll
• Growling Grass Frog
• Common Bent-wing Bat (critically endangered)
• Masked Owl
• Musk Duck
• Brush-tailed Phascogale
• Common Bent-wing Bat
• Matted Flax-lily (Dianella amoena)
• Scented Bush-pea
• Fryerstown Grevillea
• Wiry Bossiaea
• Creeping Grevillea
• Satinwood
• Brooker’s Gum
• Hairy Beard-heath
• Endemic Wombat Bush-pea