After The Fires

PROTECTING OUR FOREST REFUGES

JANUARY 2021

CRITICAL AREAS FOR PROTECTING FAUNA AND FLORA AFFECTED BY THE 2019–20 BUSHFIRES

Sooty Owl in Swift Creek Logging Coupe.

PHOTO CREDIT: FFR

Report prepared by Victorian National Parks Association, Goongerah Environment Centre, Fauna and Flora Research Collective, Gippsland Environment Group, Environment East Gippsland, and the Wilderness Society Victoria.

Contributors: Matt Ruchel, Jordan Crook, Andrew Lincoln, Chris Schuringa, Louise Crisp, Jill Redwood, Richard Hughes, Phillip Marshall.

Acknowledgment

We acknowledge the Traditional Owners of so-called East Gippsland, and pay our deepest respects to Elders past, present and emerging. We acknowledge the thousands of years of custodianship, and that sovereignty was never ceded.

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vnpa.org.au

Victorian National Parks Association
Level 3, 60 Leicester Street Carlton Vic 3053
vnpa@vnpa.org.au

Gippsland Environment Group is a not-for-profit organisation based in Bairnsdale, East Gippsland promoting conservation values and environmental understanding, carrying out surveys, research and raising awareness of the Gippsland environment and the threats it faces.

geg.org.au

Gippsland Environment Group
320 Bellbird Road Clifton Creek Vic 3875
info@geg.org.au

Goongerah Environment Centre (GECO) is a grassroots community group based in the town of Goongerah in far East Gippsland. Since 1993 GECO has campaigned for protection of East Gippsland's high conservation value forests.

geco.org.au

Goongerah Environment Centre
7203 Bonang Rd Goongerah Vic 3888
geco@geco.org.au

Environment East Gippsland Inc. is the longest running community forest group working for the protection of Victoria's last and largest area of ancient forest and connected natural environments and wildlife. EEG has been working to protect East Gippsland's natural areas and wildlife for almost 40 years.

eastgippsland.net.au

Environment East Gippsland
Locked Bag 3 Orbost 3888
eeg@eastgippsland.net.au

The Fauna and Flora Research Collective Inc. (FFRC) is an independent volunteer not-for-profit research collective engaged in surveying for and reporting on the presence of threatened species and communities within Victoria's public forests that are subject to logging.

faunaandfloraresearchcollective.wordpress.com

Fauna and Flora Research Collective
faunaandfloraresearch@gmail.com

The Wilderness Society is an Australian, community-based, not-for-profit, non-governmental environmental advocacy organisation. We work to safeguard our sources of clean water and air, to tackle devastating climate change, to create a safe future for life on Earth, and to give a better world to our children.

wilderness.org.au

The Wilderness Society Victoria
355 King Street West Melbourne 3003
melbourne@wilderness.org.au

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Definitions

Burnt – Within the 2019–20 bushfire extent

CAR Reserve System – Comprehensive, Adequate, Representative Reserve System; dedicated reserves, informal reserves, and other protected areas on public land

Coupes or 'logging coupes' – Forest areas scheduled for logging

Conservation status – Globally recognised system for classifying species into categories of risk of extinction

CR – Critically endangered; conservation status for species facing an extremely high risk of extinction in the wild in the immediate future

DELWP, or 'the Department' – Department of Environment, Land, Water and Planning

The Department's biodiversity report – Refers to DELWP's August 2020 report *Victoria's bushfire emergency: biodiversity response and recovery Version 2*

EPBC Act – Environment Protection and Biodiversity Conservation Act 1999, national environmental and threatened species law

EN – Endangered; conservation status for species facing a very high risk of extinction in the wild in the near future.

EVC – Ecological Vegetation Class, groupings of vegetation communities based on floristic and ecological characteristics

FFG Act – Flora and Fauna Guarantee Act 1988, Victoria's main threatened species law

FMA – Forest Management Areas; breaks all Victorian forests into zones, and establishes objectives for conservation, land management and logging

GMZ – General Management Zone; the area largely zoned/available for commercial logging

Ha – Hectares

HIM – Habitat Importance Model, score given to areas based on importance of habitat for species

IPA – Immediate Protection Area, announced by the Victorian Government in November 2019, yet to be made permanent

Informal reserves – Areas with impermanent protections that can be removed by a Minister or Department official without requiring Parliamentary approvals e.g., SPZ

Listed – Refers to listing of species or vegetation communities (EVCs) under state environment legislation (FFG Act), or federal environment legislation (EPBC Act) based on conservation status

Refuge – Habitat or isolated safe haven within or outside a disturbed area

RFAs – Regional Forest Agreements, agreements between State and Commonwealth Governments that provide for special management and commercial exploitation of Victoria's forests

SMZ – Special Management Zone, part of the forest zoning system which allows logging with certain conditions

SPZ – Special Protection Zone, part of the informal reserves system which is managed largely for conservation

TRP – Timber Release Plan, a five-year rolling plan that identifies areas called coupes that may be logged over the next three to five years, updated by VicForests at least annually

Unburnt – Outside the 2019–20 bushfire extent

VicForests – Victorian State Government-owned logging agency

VU – Vulnerable; conservation status for species facing a high risk of extinction in the wild in the medium-term future

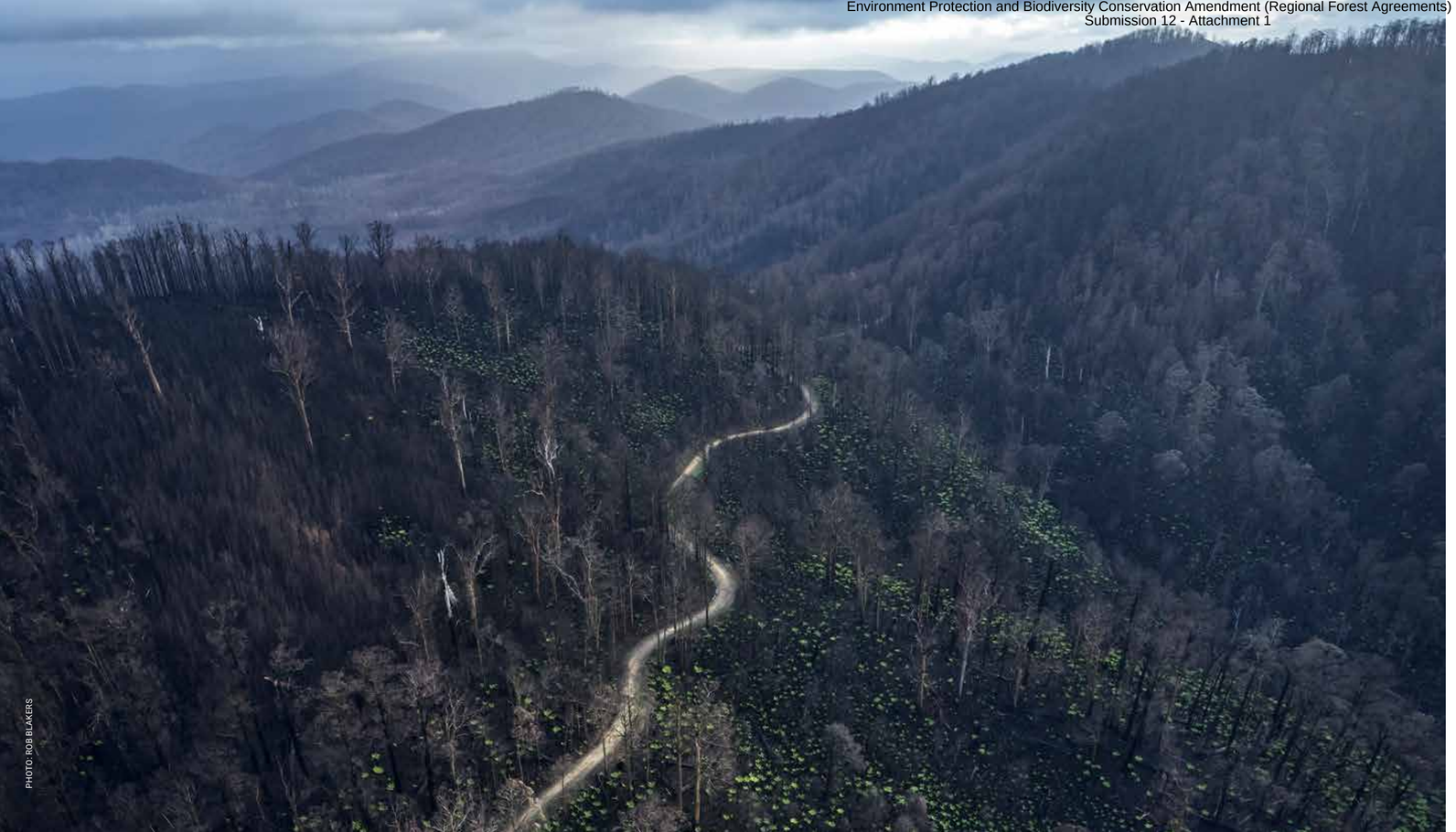

PHOTO: ROB BLAKERS

Executive summary

Eastern Victoria has long been a stronghold for forest biodiversity and rare and threatened plants and animals. Its regional reserves, national parks, and state forests are hotspots for nature-based tourism. The 2019–20 bushfires in eastern Victoria have put much of this at risk.

The bushfires were unprecedented in scale and severity. The impacts on plant and animal communities are extensive and come in the context of increasing frequency of wildfires in forest landscapes. Many areas in eastern Victoria have burned multiple times over the past few decades, threatening the survival of a multitude of plants, animals, and ecological communities.

Analysis of the 2019–20 bushfire spatial data reveals that more than 1.25 million hectares burnt across the three most heavily impacted Forest Management Areas (FMAs): East Gippsland, North-East and Tambo.

More than 200 flora species have had 50–100% of their extent affected by the fires, of which 154 have been identified by the Department of Environment, Land, Water and Planning (DELWP) as of high concern due to fire impacts. DELWP has also identified 67 fauna species of most concern, with 20 species having between 50–80% of their distribution within the fire extent.[1]

Past logging has profoundly modified large areas of forest throughout eastern Victoria and reduced habitat size and quality. For the bushfire-affected threatened species focused on in this report, logging is identified as a major threat to their already precarious status.

Leading scientists have identified that key unburnt refuge areas should be the immediate and ongoing focus for conservation.[2]

In October 2020, DELWP also released risk assessments for all species and communities listed under the Fauna Flora Guarantee Act which was completed as part of the newly signed Regional Forest Agreements (RFAs).[3] The assessments reaffirm the dire impacts of logging on threatened species, including those focused on in this report.

Many species had experienced significant range contractions before the fires, making the small fragments of forest that escaped the 2019–20 bushfires even more critical to preserve. **According to our analysis, of the 585,000 ha of state forests in the East Gippsland FMA, only 112,000 ha is outside the fire extent of which 90,000 ha remains unprotected.**

This report focuses on ten refuge areas in the East Gippsland, Tambo, and North-East FMAs that are critical to the survival of threatened plants, animals, and vegetation communities. These key refuge areas were selected by reference to bushfire extent and severity spatial data and threatened species Habitat Importance Models (HIMs)[4], and are not an exhaustive list of forest refuges or key habitat areas in the region or across Victoria.

East Gippsland FMA

- Errinundra
- Cottonwood Range
- Colquhoun
- Cabbage Tree
- Sardine Creek to Bemm
- Far Eastern Forests
- Nunniong

Tambo FMA

- Colquhoun
- Nunniong
- Swifts Creek
- Mt Alfred

North-East FMA

- Alpine Region

Some areas identified in this report were impacted by low severity fire, but still function as important habitat for a range of species. They should also be considered important refuge areas in conjunction with remaining unburnt forest areas.

Our analysis shows that significant areas of critical habitat are under imminent threat from logging. Case studies of these areas, including proposed logging plans and key affected threatened species, are discussed in the following pages.

In May 2020, the Victorian government's Environment Department made recommendations that logging stop in key unburnt habitat for threatened species to halt the threat of irreversible damage to biodiversity after the 2019-20 bushfires.[5]

Despite those recommendations, logging has recommenced in these areas following the bushfires. Future logging plans remain a significant threat to forests and wildlife. **Across the 10 refuge areas, 553 logging coupes covering more than 20,000ha of forest are planned for logging by the Victorian government's logging agency VicForests.**

In light of the impacts of the 2019–20 bushfires and continuing threats logging poses to wildlife, this report makes the following recommendations:

1. **Protect each of the key refuges identified in this report and any other remaining unburnt forests from current and future logging to ensure the survival and persistence of flora and fauna species that rely on these forests to survive.**

   For example, protect the remaining 90,000ha of unprotected state forest in East Gippsland that is outside the fire extent.[6] Further logging in the small unburnt fragments of forest, and in areas impacted by low severity fire, will have dire consequences for threatened flora and fauna that have survived in these areas. Action to protect these areas would be in line with DELWP's bushfire response planning.

2. **Commit to not logging any identified habitat remaining in Victoria for each threatened species significantly affected by the 2019–20 bushfires, particularly those species listed in this report.**

   Many of the species listed in this report are set to have their conservation status upgraded in the next 24 months. Protecting any remaining habitat from logging while this process is undertaken is a critical first step to giving these species the best chance of recovery following the catastrophic bushfires and will help safeguard them against future impacts of bushfires and climate change.

3. **Bring forward the 2030 transition out of native forest logging.**

   In November 2019 the Victorian government committed to a decade-long transition out of native forest logging. This timeframe was too slow even before the bushfires and its devastating impact on forests and wildlife. Now there is an even more urgent need to rapidly transition the logging industry out of native forests to remove a key identified threat to the survival of threatened and endangered wildlife.

4. **Prioritise funding and restoration of areas impacted by the bushfires to restore habitat and provide better resources for weed and pest control programs in forest areas to improve recovery from bushfire events.**

5. **Declare and map the key refuges identified in this report as high priority assets in need of protection from all types of future fires, including planned burns.**

Diblo logging coupe, area lightly burnt in 2016/17, unburnt by 2019/20 bushfires, logged August 2020. 2019 surveys found Long-footed Potoroo, Powerful owl and Yellow-bellied glider records within this coupe

PHOTO: LISA ROBERT

PHOTO: ROB BLAKERS

Introduction

This report analyses the impacts the 2019–20 bushfires have had on selected species, state forests and forests protected within the reserve system and national park estate. It also identifies key areas which form some of the last refuges for eastern Victoria's threatened and most precious plant and animal communities.

Refuges for wildlife can be areas less severely impacted by fire, small patches of unburnt habitat within more severely burnt areas, and areas outside the fire extent.

Eight of the ten refuge areas identified within this report are larger forest areas outside and adjacent to the fire extent while two of the areas identified are less severely burnt forests that include smaller patches of remaining unburnt habitat within them.

The key refuge areas were selected by reference to bushfire extent and severity spatial data and Habitat Importance Models[7] (HIMs) data for key fauna species. This data shows where the most important modelled habitat is for each species. Refer to the Appendix for detailed HIMs graphs and maps for each species.

Following the bushfires, the Victorian Government released two biodiversity reports: one in January and another in August 2020. The reports describe some of the impacts on key species, but neither report adequately addresses the importance of protecting habitat from logging, or the impacts logging will have on the small remnants of unburnt habitat for the species identified.

In May 2020, the Victorian government's Environment Department also made recommendations that logging stop in key unburnt habitat for threatened species to halt the threat of irreversible damage to biodiversity post bushfires.[8] The document states:

The Conservation Regulator believes that the precautionary principle is currently triggered by risks of serious and irreversible damage to Victoria's biodiversity posed by timber harvesting operations in light of the 2019/20 Victorian bushfires, and the significant scientific uncertainty about the status of Victoria's biodiversity from these operations in this context.[9]

In October 2020, the Department also released risk assessments for all species and communities listed under the Flora and Fauna Guarantee Act (FFG Act) which was completed as part of the newly signed Regional Forest Agreements (RFAs)[10]. The assessments reaffirm the impacts of logging on threatened species and the need to protect critical habitat where these species persist.

Leading scientists from the Threatened Species Recovery Hub made recommendations in January 2020 following the bushfires to locate and protect key refuge areas which ***"will be of profound importance for species' recovery, and hence should be the immediate and ongoing focus for conservation management"***.[11]

The cumulative impacts of drought, bushfires, and logging, combined with threats posed by extreme climatic events, foreshadows the increasing risks that eastern Victoria's flora, fauna, and ecological communities face.

In the last fifty years, logging has greatly modified large areas of forest throughout eastern Victorian, diminishing the habitat for a range of rare wildlife. For most of the bushfire-affected threatened species focused on in this report, logging is listed as a major threat in their FFG Act Action Statements.

The species highlighted in this report are listed, or provisionally recognised under Victorian and Commonwealth threatened species laws, but this listing has failed to translate to concrete action. Legislation and recovery planning have so far failed to address key threatened species requirements, demonstrated by the continued logging of threatened species habitat both prior to the 2019-20 fires, and following. For many threatened species, their survival has become even more perilous.

Despite the horrendous and extensive bushfire impacts to wildlife and forests, and the now undeniable increase in the habitat value of remaining areas – pre-fire logging plans have stayed in place. Astoundingly, two additional schedules of new logging areas have been announced post fire, one approved in July, and another approved in December 2020. Logging has recommenced across eastern Victoria and continues to further threaten these now critically important unburnt forest refuges.

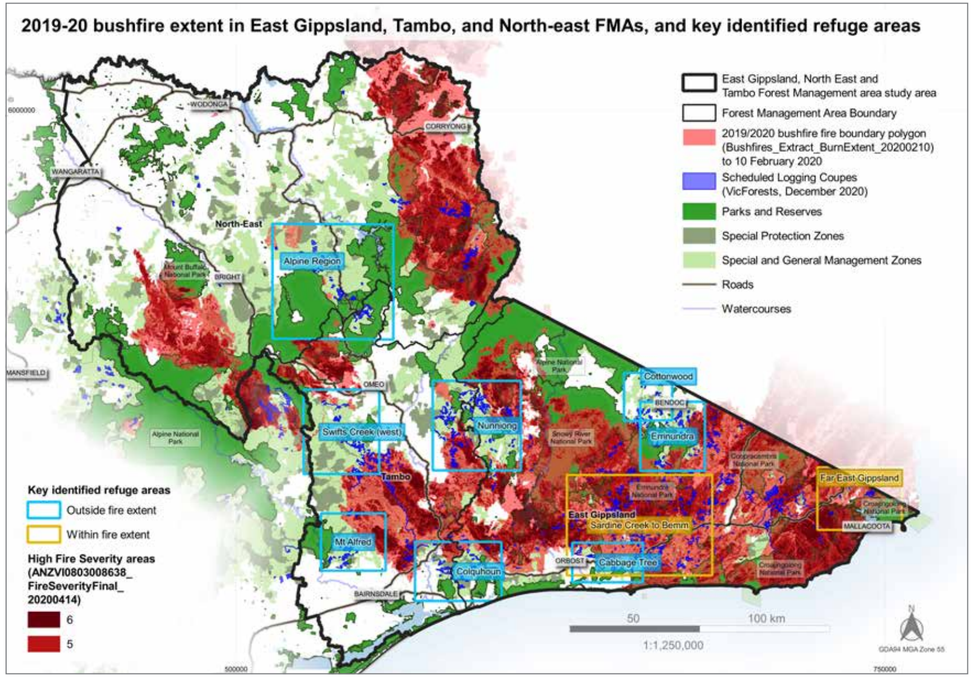

Figure 1: 2019–20 bushfire extent in East Gippsland, Tambo and North-east FMAs, and key identified refuge areas

Impacts of the 2019–20 fires on forests and wildlife

Analysis of the 2019–20 bushfire extent and severity spatial data, in conjunction with State Forest management zoning and parks and reserves tenure mapping, reveals that more than 1.25 million hectares burnt across the three most heavily impacted FMAs: East Gippsland, North-East and Tambo.

Almost half of the conservation parks, reserves and Special Protection Zones within the Comprehensive, Adequate and Representative (CAR) reserve system in these three FMAs is within the fire extent.

The bushfires also heavily impacted the proposed Immediate Protection Areas (IPAs). Announced in November 2019, the IPAs were intended as new conservation measures for the threatened Greater Glider. Approximately 90% of the IPAs in East Gippsland burnt, with a large proportion subject to high-severity fires.

The fire impacts on eastern Victoria's forest habitat for plants and wildlife were unprecedented in scale and severity. Ecological responses to fire are complex, but fire severity can be a key factor influencing impact on species survival.

Bushfire severity mapping shows that more than half the area in the fire extent experienced moderate to high fire severity. Moderate severity is defined as having 20–80% canopy scorch and high severity has greater than 80% canopy scorch.[12]

Across the three FMAs, more than half of state forest was within the fire footprint. In East Gippsland, this number was more than 80%. Table 1 shows the area and percentage within the fire extent and percentage of high severity fire in the three fire-affected FMAs focused on in this report. Table 2 shows the area and proportion of unprotected state forest outside the 2019–20 bushfire extent, which contains the key identified refuge areas.

According to our analysis, of the 585,000 ha of state forests in the East Gippsland FMA, only 112,000 ha is outside the fire extent of which 90,000 ha remains unprotected and open for logging.

Tenure	East Gippsland FMA			North-East FMA			Tambo FMA			East Gippsland, North-East and Tambo FMAs		
	Area within fire extent (ha)	% within fire extent	% impacted by high severity fire	Area within fire extent (ha)	% within fire extent	% impacted by high severity fire	Area within fire extent (ha)	% within fire extent	% impacted by high severity fire	Area within fire extent (ha)	% within fire extent	% impacted by high severity fire
State forests (All zones)	472,074	81%	38%	187,085	32%	17%	180,025	49%	21%	839,184	55%	26%
State forests (SPZ)	88,915	80%	37%	47,002	30%	15%	66,385	54%	25%	202,302	52%	24%
Parks and reserves	299,715	64%	31%	122,496	31%	16%	24,593	22%	10%	446,803	46%	22%
IPAs (2019)	67,133	92%	46%	n/a	n/a	n/a	n/a	n/a	n/a	67,133	92%	46%
State forests and parks and reserves	771,789	74%	35%	309,581	32%	17%	204,618	43%	19%	1,285,987	52%	25%

Table 1: Impact of fire on land tenures in three eastern Victorian Forest Management Areas

Tenure	East Gippsland FMA		North-East FMA		Tambo FMA		East Gippsland, North-East and Tambo FMAs	
	Area outside fire extent (ha)	% outside fire extent	Area outside fire extent (ha)	% outside fire extent	Area outside fire extent (ha)	% outside fire extent	Area outside fire extent (ha)	% outside fire extent
Unprotected State forests (GMZ and SMZ, excluding SPZ)	89,934	19%	280,768	67%	129,356	53%	500,057	44%
State forests (Special Protection Zones)	22,557	20%	108,237	70%	56,228	46%	187,021	48%
Parks and reserves	165,704	36%	272,494	69%	85,747	78%	523,945	54%
Total	278,194	26%	661,499	68%	271,330	57%	1,211,023	48%

Table 2: Land tenures in three eastern Victorian Forest Management Areas and percentage **outside** 2019–20 bushfire extent

Impacts on flora

A range of diverse forest and vegetation types were burnt in the fires and face further indirect impacts such as soil erosion and greater exposure to feral deer, horses, pigs, goats, and invasive weeds.

Some of the most significantly affected vegetation communities include Alpine Sphagnum Bogs and Associated Fens and both Warm and Cool Temperate Rainforests. Nine specific vegetation groups (categorised as Ecological Vegetation Classes or EVCs have more than 50% of their modelled area within the fire extent.[13]

More than 200 flora species have had 50–100% of their extent affected by the fires. The Department's bushfire emergency biodiversity report identified 154 flora species of most concern that have been impacted by the fires.

Our report focuses on three plant species that suffered significant fire impacts and are vulnerable to land management practices such as logging:

1. **Alpine Ash** – Eucalypt found in higher elevation forests, extremely vulnerable to fire. Commercial species targeted by logging.
2. **Errinundra Shining Gum** – Eucalypt species found only on the Errinundra Plateau in East Gippsland. Targeted by logging.
3. **Colquhoun Grevillea** – Small flowering shrub restricted to a small area in Colquhoun, East Gippsland. Impacted by logging operations.

The species are listed in Table 2 along with 2019–20 bushfire impacts and continued threats. Many other plant species are similarly affected.

Colquhoun Grevillea (*Grevillea celata*) state and federally listed threatened species only found in East Gippsland.

PHOTO: FFRC

Flora species	2019–20 bushfire impact on modelled distribution		Commonwealth			State		
	% within fire extent	% high severity	Current EPBC listing	Draft EPBC listing	Recovery Plan	FFG listed	Provisional assessment	Threats identified in FFG Action Statement
Alpine Ash (***Eucalyptus delegatensis delegatensis***)	24%	14%	–	–	–	No	–	[Despite species not being listed under FFG Act or Environment Protection and Biodiversity Conservation Act (EPBC Act), the Department's biodiversity report acknowledges decline and vulnerability of species due to threat of multiple burns/increased fire frequency.[14]]
Errinundra Shining Gum (***Eucalyptus denticulata***)	42%	21%	–	–	–	No	EN	[Not currently listed under FFG Act but set to be listed as endangered. The Department's biodiversity report states: This is a keystone species of the Errinundra subalpine forests, and only a small, single seed lot is held at RBGV.[15]]
Colquhoun Grevillea (***Grevillea celata***)	56%	24%	VU	VU	Yes	Yes	CR	• Inappropriate fire regimes • Weed invasion • Disease / insect attack • Reservation status • Grazing / browsing • Road works • Inappropriate slashing

Table 3: Fire affected assessed flora species (source: DELWP biodiversity response and recovery report

Impacts on fauna

Much of Victoria's native wildlife was terribly impacted by the bushfires. The fires wiped out large areas of important habitat for a range of species. These species also impacted by increased populations of feral animals such as cats and foxes.

The Department's bushfire emergency biodiversity report has identified 67 fauna species of most concern following the bushfires.[16] Twenty of those species have 50–80% of their distribution within the fire extent.

This report focuses on nine species that suffered significant fire impacts, and which are vulnerable to destructive land management practices such as logging. The species are listed in Table 4 along with 2019–20 bushfire impacts and continued threats.

PHOTO: CHRIS TAYLOR

Fauna species	2019–20 bushfire impact on modelled habitat		Commonwealth			State		
	% within fire extent	% high severity	Current EPBC listing	Draft EPBC listing	Recovery Plan	FFG listed	Provisional FFG assessment	Threats identified in FFG Action Statement
Southern Greater Glider (*Petauroides volans*) *See p 23*	32%	16%	VU	EN	No	Yes	VU	• Habitat degradation • Bushfire • Planned burns • Climate change • **Logging** • Predation
Spot-tailed Quoll (*Dasyurus maculatus*) *p 25*	36%	19%	EN	–	Yes	Yes	EN	• **Habitat clearing** • Fragmentation and disturbance • Poison baiting programs • Predation and competition from invasive species
Masked Owl (*Tyto novaehollandiae*) *p 27*	54%	26%	–	–	No	Yes	CR	• **Land clearance and fragmentation** • Loss of trees with large hollows • Loss of prey species and density
Lace Monitor (*Varanus varius*) *p 29*	16%	8%	–	–	–	No	EN	[The Lace Monitor is set to be listed as endangered under Victorian environment law, following provisional assessment.[17] Logging and habitat degradation is already understood to be a key threat to the species.]
Long-footed Potoroo (*Potorous longipes*) *p 31*	79%	41%	EN	–	Yes	Yes	EN	• Predation (especially by introduced species) • **Habitat destruction or degradation from timber harvesting** • Fire • Climate change • Small populations
Glossy Black Cockatoo (*Calyptorhynchus lathami*) *p 33*	64%	26%	–	–	No	Yes	CR	• **Habitat damage and loss from logging** • Inappropriate fire regimes • Climate Change
Powerful Owl (*Ninox strenua*) *p 35*	26%	16%	–	EN	No	Yes	VU	• **Loss and fragmentation of habitat** • **Loss of large hollow bearing trees** • Vulnerable to land management practices that reduce the availability of these tree hollows • Predation and competition from invasive species
Sooty Owl (*Tyto tenebricosa*) *p 39*	47%	24%	–	EN	No	Yes	EN	• **Habitat degradation** • Loss of hollow bearing trees • Clearing of habitat and logging
Giant Burrowing Frog (*Heleioporus australiacus*) *p 42*	75%	38%	VU	–	No	Yes	CR	• **Timber harvesting and roading** • Lack of knowledge on its biology • Changes to water flow and quality • Removal of litter from the forest floor • Road construction and maintenance • Fuel reduction burning and wildfire • Weed invasion and subsequent herbicide spraying • Predation by exotic species

Table 4: Selected Fauna Species affected by the 2019–20 bushfires (source: DELWP biodiversity response and recovery report)

Forest refuges under threat

This report focuses on 10 key refuge areas across eastern Victoria that are critical to the survival of plants, animals and vegetation communities following the 2019–20 bushfires. The refuge areas were selected by reference to bushfire extent and severity spatial data and Habitat Importance Models (HIMs)[18] across Forest Management Areas (FMA). This is not an exhaustive list of forest refuges or key habitat areas in the region or across Victoria.

East Gippsland

- Errinundra
- Cottonwood Range
- Colquhoun
- Cabbage Tree
- Sardine Creek to Bemm
- Far Eastern Forests
- Nunniong

Tambo

- Colquhoun
- Nunniong
- Swifts Creek
- Mt Alfred

North-East

- Alpine Region

These unique and diverse landscapes support a range of bushfire-affected species, yet they are still under threat from logging.

Across the 10 refuge areas, 553 logging coupes covering over 20,000ha of forest are planned for logging.

Many parks, reserves, and protected areas have now been impacted by fire. Protecting unburnt and lower severity burnt forest refuges is vital for the short-term survival of rare flora and fauna that have elsewhere been impacted by fire. Over time, these refuges will act as strongholds for species, allowing recolonisation into burnt areas and the recovery of viable populations in the long term. The refuge areas alone cannot support rare plants and animals but are critical to the process of recover in the short term.

Key unburnt areas ensure rare flora and fauna do not suffer further serious decline. Protecting these areas from logging to avoid decline of species towards extinction must be a priority for the Victorian and Commonwealth governments.

Some areas identified in this report were impacted by low severity fire, but still function as important habitat for a range of species. They should also be considered important refuge areas in conjunction with remaining unburnt forest areas.

Our analysis shows there are significant areas of critical habitat under imminent threat from logging. Since the 2019–20 bushfires, two new Timber Release Plans (TRPs), the formal process by which areas are planned for logging, have been approved by the Victorian government's logging agency VicForests. One TRP approved more than 50 'salvage logging' coupes which are concentrated in the North-East region in fire-affected ash forests. In December 2020, another TRP added over 100 new coupes to the East Gippsland, Tambo, and North East schedule inside and outside the fire extent.

Since the fires, most logging in eastern Victoria has been concentrated in fire-affected forests, threatening their recovery at this critically sensitive stage. Post-fire logging, referred to as 'salvage logging', has been shown to be the most damaging form of logging, with research documenting irreversible impacts with catastrophic effects.[19]

Many forest areas within the Eastern Victoria fire extent are burnt to varying degrees but are still recovering mixed species forests where overstorey trees have not been killed by fire. The trees in these areas are alive and recovering, and the forests still function as important habitat for species that managed to survive the fires. Yet logging has gone ahead and is planned in many of these vulnerable recovering areas.

Logging has also recommenced in unburnt forests in eastern Victoria, including in some of the key refuge areas identified in this report: the Colquhoun, Cabbage Tree and Swifts Creek areas. These areas were also identified by the Victorian government as "the best post-fires habitat (the top 20%)" for priority threatened species under greater threat since the bushfires, including habitat of species identified in this investigation.[20] Yet logging continued in these important forest refuges.

The Department acknowledged in its bushfire emergency biodiversity response planning the need to immediately "identify and design protections for key unburnt areas and populations within the current fire extent" and to "[p]rotect and manage key populations of species outside the current fire extent".[21] **This must include protection from logging of threatened species habitat and the key refuge areas in and outside the fire extent identified in this report.**

Refuge area	Forest Management Area						Total	
	East Gippsland		Tambo		North-east			
	# coupes	Area (ha)	# coupes	Area (ha)	# coupes	Area (ha)	# coupes	Area (ha)
Errinundra	59	2117					59	2117
Cottonwood	40	1228					40	1228
Colquhoun	36	1292	17	597			53	1889
Cabbage Tree	25	984					25	984
Sardine Creek to Bemm	96	3779					96	3779
Far East	9	363					9	363
Nunniong	56	2605	67	2378			123	4983
Swift's Creek (west)			67	2238			67	2238
Mt Alfred			34	1339			34	1339
Alpine Region			10	462	37	1759	47	2221
Total	**321**	**12368**	**195**	**7014**	**37**	**1759**	**553**	**21141**

Table 5: Number of logging coupes and area outside fire extent or less severely burnt within the key identified refuge areas

Key identified refuges in East Gippsland FMA

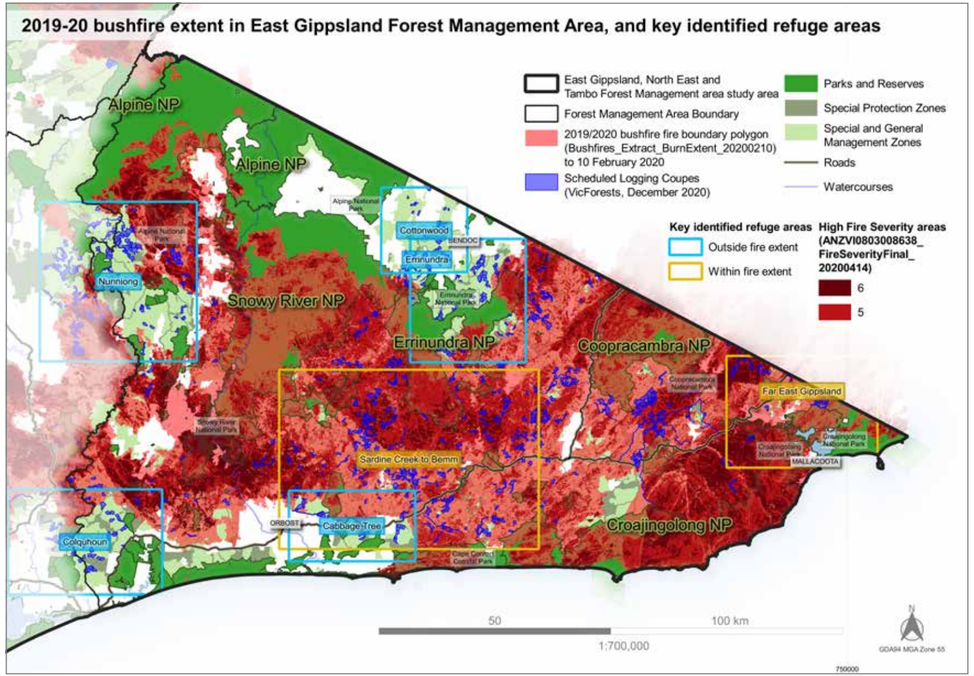

Figure 2: East Gippsland FMA

Errinundra

Errinundra has some of the most diverse, ancient ecosystems in Australia, with links to Gondwanic forests. The wet forests on the Errinundra plateau fringe the largest stand of cool temperate rainforest on the mainland. Remaining old growth forests throughout the region are strongholds for iconic wildlife like the Greater Glider, large forest owls and the Long-footed Potoroo. Logging in the region has intensified since the 1980s and most of the remaining stands of unburnt, unlogged forest have now been approved for logging by VicForests.

The forests in Errinundra, south of Bendoc and north-west of Combienbar in East Gippsland, are highly significant for conservation of biodiversity and threatened species. Rich rainforest areas support dense stands of Sassafras, Black Oliveberry and Soft Tree-Ferns, plus the rare endemic Errinundra Shining Gum. Part of the Errinundra National Park burnt in the fires, but most of the state forest to the north of the park escaped the fires.

With around 42% of the modelled habitat distribution for the Errinundra Shining Gum within the fire extent and 21% subject to high severity fire, it is critical that all remaining stands are protected.

Stands of old hollow-bearing trees, some more than 600 years old, provide homes for the threatened Greater Glider. According to the HIM, the Errinundra forest region contains some of the best habitat for the Greater Glider. Only 19% of areas modelled as important for the species in East Gippsland FMA remain unburnt *with more than half of this unburnt area still available for logging*.

Species detection data and the HIM show the Errinundra area is also a stronghold for the Long-footed Potoroo, another species which has been gravely impacted by the fires, as over 80% of its known habitat is within the fire extent.

Many stands of forests scheduled for logging adjoin Errinundra National Park. Unfortunately, the boundaries of the park were constrained at the time of its creation in the early 1980s and have been compromised over time by adjacent logging. It is now critical that any further edge effects from logging are halted and adjoining surviving forests are restored. This requirement for sensitive management of the Park's boundaries is clearly stated in the Errinundra National Park Management Plan[22], but to date has been ignored. Both the park and adjoining forests contain important unburnt refugia for wildlife like the Greater Glider and Long-footed Potoroo and are an important 'Ark' ensuring the survival of these species.

PHOTO: JILL REDWOOD

Gippsland Waratah

Sellers Road, Errinundra. Scheduled for logging.

PHOTO: JUSTIN CALLY

Southern Greater Glider

The Greater Glider is Australia's largest gliding mammal. It was once a common forest-dwelling species, but in the past twenty years glider populations have declined by 80%.[23] This is largely due to intensive logging and bushfires impacting suitable habitat. The Glider is listed as vulnerable under federal legislation, but its status is currently drafted to be upgraded to endangered.

Greater Gliders have a limited home range,[24] making localised extinction likely when their habitat is logged. According to our HIM analysis, only around 37% of Glider habitat is now unburnt across the East Gippsland, Tambo and North East FMAs [25]. Just over half of that area is unprotected and still available for logging despite supporting significant populations and containing some of the best habitat for the species.

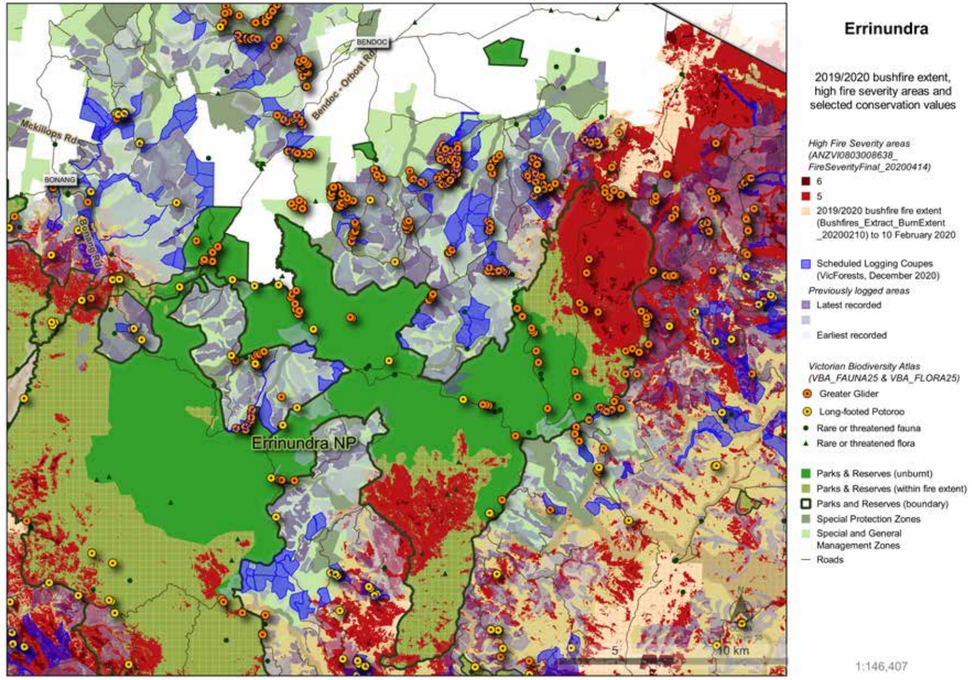

Figure 3: Errinundra

Cottonwood Range

The Cottonwood Range forms the northern extension of the Errinundra Plateau and has forests with similar characteristics to the wet forests of the Errinundra region. The area contains critical habitat for the threatened Greater Glider and is one of the few places with recent records of the rare and elusive Spot-tailed Quoll, a species rarely recorded elsewhere in Victoria.

The forests of the Cottonwood Range, between Bonang, Bendoc, and the Victorian State border, have similar characteristics to the high elevation wet forests of the Errinundra region. Mature stands of forests in the Cottonwood range have been fragmented by past logging.

A detection of the endangered Spot-tailed Quoll in the Cottonwood Range forests in 2016 required the creation of Special Protection Zones. However, the 500 ha of forest protected for the species did not include critical old growth forest areas just hundreds of meters from where the quoll was found, and these forests were then extensively logged in 2018.

The Cottonwood Range is also a hotspot for the Greater Glider, with habitat modelling showing that the forests in the area provide some of its best habitat. The Greater Glider relies on the presence of hollow-bearing trees to survive, using them for shelter and nesting.

Playgrounds Track,
Scheduled for logging.

Spot-tailed Quoll

The Spot-tailed Quoll is mainland Australia's largest carnivorous marsupial. It has an extensive home range of over 2500 hectares. This home range must include large areas of continuous intact forest with suitable den sites and prey to accommodate the quoll's survival. It is listed as endangered under both the FFG Act and EPBC Act.

Any logging in these areas poses a serious threat to the survival of the species. The bushfires have reduced the number of suitable refuges and created higher competition for resources. This makes the quoll more vulnerable to competition pressures from introduced species like foxes and cats.

According to the Department's biodiversity report, 36% of the Quoll's habitat is within the fire extent[26], making unburnt forest areas within its best modelled habitat now extremely vulnerable and crucial to protect. Over 30% of the quoll's protected habitat across the three fire-affected FMAs has burnt[27]. Additional areas must be set aside to ensure the continued survival of this unique endangered marsupial carnivore.

PHOTO: CHRIS TAYLOR

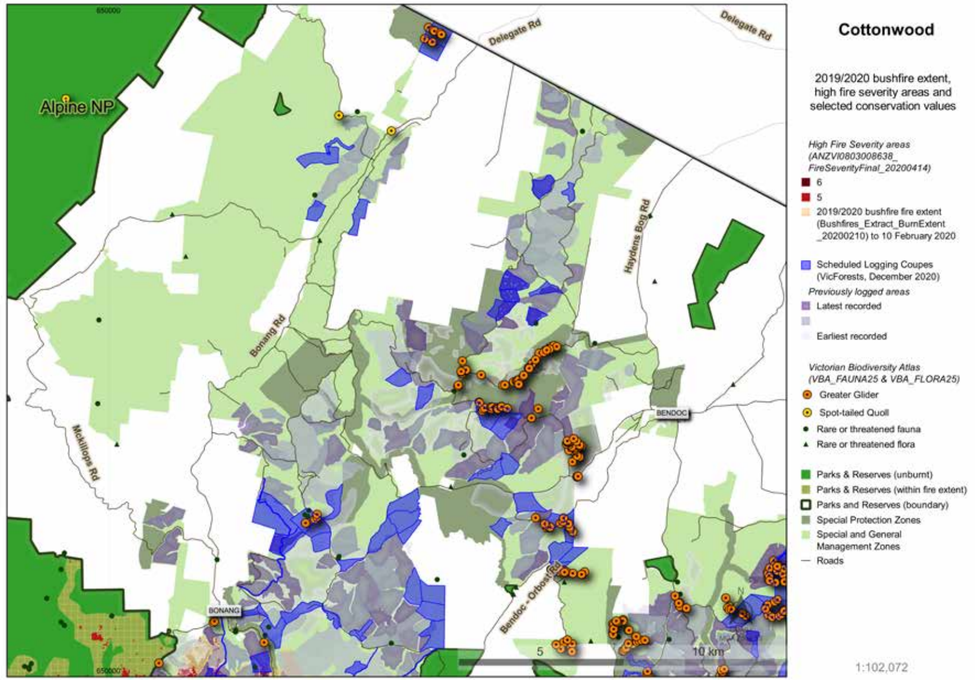

Figure 4: Cottonwood

Colquhoun

The Colquhoun region is the forest backdrop for the popular coastal town Lakes Entrance and is important for local tourism and recreation. Having survived the 2019–20 bushfires, it is also significant for its range of rare and threatened plant and animal species, including the Masked Owl and Colquhoun Grevillea, a plant unique to the East Gippsland region. The region contains important remnant East Gippsland Lowland Forest, an EVC which has been heavily impacted by past logging and fire.

Lowland Forest can contain important stands of Black She-Oak *Allocasuarina littoralis* which the threatened Glossy Black Cockatoo feeds off almost exclusively. The Colquhoun forest is the most south-western extent of the Cockatoo's range on mainland Australia, a range which has been heavily impacted by the fires. Only small fragments of unburnt forests remain as feeding areas for the Cockatoo, including the Colquhoun forests.

The endemic Colquhoun Grevillea has 56% of its distribution within the fire extent, of which 24% was classified as high severity fire. The Department estimates that a "[m]ajority if not all populations [have been] impacted".[28] Many of the remaining records are in state forest still available for logging.

Past logging has already degraded and fragmented this refuge of unburnt forest. Despite the catastrophic impacts of the fires on the significant environmental values found in the area, logging has recommenced in Colquhoun, even in logging coupes where Masked Owl had been recorded after the fires.

Colquhoun State Forest, area scheduled for logging.

Masked Owl

Victoria's rarest forest owl, the Masked Owl is listed as threatened under the FFG Act and currently considered endangered on the advisory list, with plans to upgrade the species to critically endangered.

Masked Owls in East Gippsland are concentrated in lowlands forests close to the coast. The Colquhoun is an important unburnt area with suitable habitat and very recent records of Masked Owl in areas still scheduled for logging. These areas should be protected.

According to our analysis, in three of the main forest management areas affected by the fires around 80% of habitat deemed important for the Masked Owl was impacted by the bushfires. Only around 10% of the important habitat areas are unaffected by fire and protected[29]. In this context, the Colquhoun provides significant refuge for the species.

PHOTO: ROHAN BILNEY

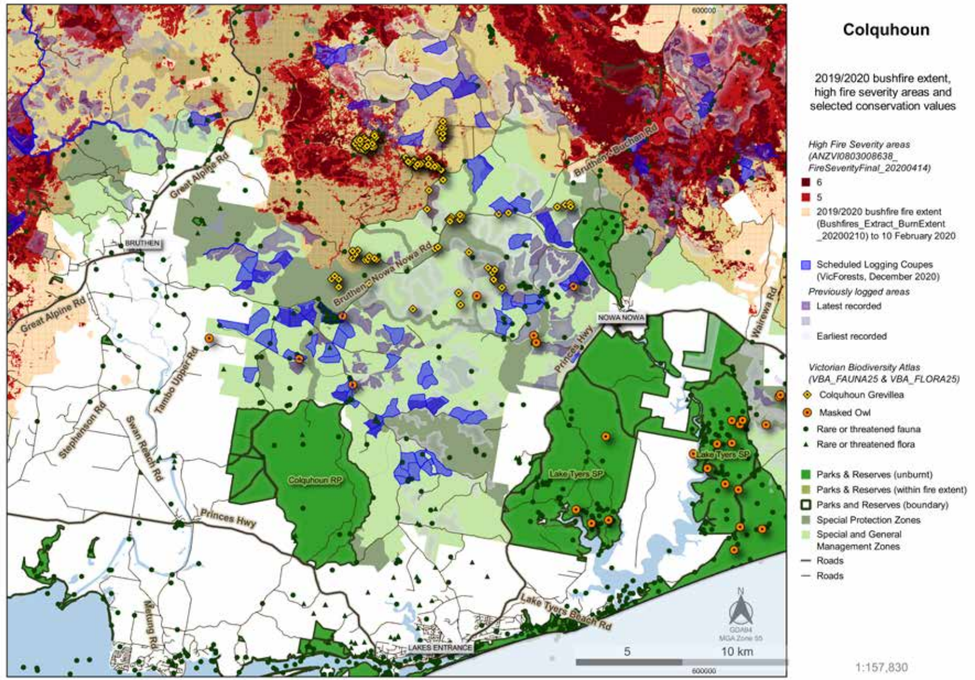

Figure 5: Colquhoun

Cabbage Tree

Close to Orbost and Marlo, the Cabbage Tree forest area includes the unique and significant Cabbage Tree Creek Flora Reserve and the popular Cape Conran Coastal Park and surrounding coastal state forests. The Cabbage Tree Reserve's rainforest attracts rare bird species like the Large-billed Scrubwren and Top-knot Pigeon, making it a popular destination for bird watchers and tourists.

The Cabbage Tree Creek Flora Reserve contains one of Victoria's only three stands of Cabbage Fan-palms, a flora species usually found further north on the New South Wales coast and in Queensland. The palm grows in warm-temperate rainforest, a forest type dominated by Jungle Grape vines, Lilly-pilly, and epiphytic ferns.

The surrounding area is mostly drier, low elevation coastal forest. This is the preferred habitat for the Lace Monitor, Victoria's largest lizard, which is often encountered by visitors to East Gippsland's coastal parks.

Cabbage Tree's forests contain significant unburnt stands of the Banksia Woodland forest type. Over 80% of its modelled distribution is within the fire extent.[30]

The Cabbage Tree forests are at the southern extent of the Long-footed Potoroo's range and in this area overlap with the range of the similarly threatened Long-nosed Potoroo whose distribution is confined to forests closer to the coast.

Logging has already recommenced in this area after the bushfires. Logging scheduled close to the Cabbage Tree Creek Reserve threatens the integrity of the area. The reserve, Cape Conran Coastal Park and surrounding state forests are popular tourism destinations providing important economic benefits for the surrounding regional towns. They are also vital to the wellbeing of the local community.

PHOTO: LISA ROBERTS

PHOTO: LISA ROBERTS

Lace Monitor amongst logging slash in Lior logging Coupe, Colquhuon.

Lace Monitor

The Lace Monitor, also known as Tree Goanna, is a large terrestrial and semi-arboreal lizard, an often seen and highly recognisable animal in Victoria's coastal forest landscapes. The Lace Monitor lays its eggs in termite mounds and termite colonies within trees using the heat from the mounds to incubate its eggs.[31]

The Lace Monitor's East Gippsland range was heavily affected by fires. According to our analysis, over 60% of its most important modelled habitat in the East Gippsland FMA was impacted by fire[32].

The Lace Monitor is set to be listed as endangered under the FFG Act, following provisional assessment.

Logging and habitat degradation are known threats to the species, which shelters in tree hollows. The species was common in Victoria but given the threats of logging and the profound impacts of the bushfires on the species, urgent action must be taken to remove the threat of logging to this already endangered species.

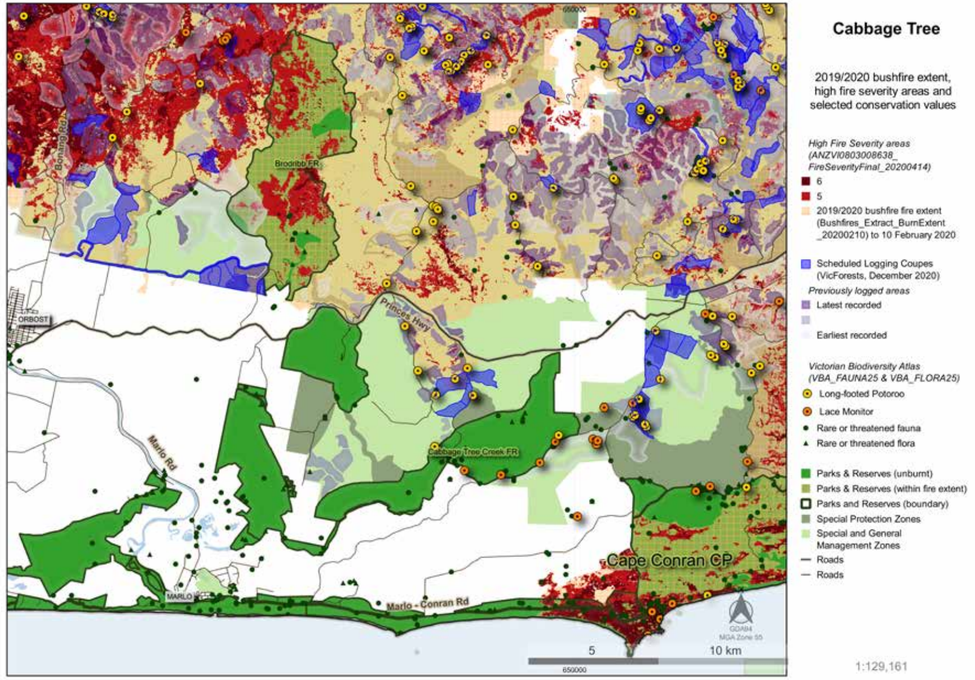

Figure 6: Cabbage Tree

Sardine Creek to Bemm

Extending from the foothill forests north-east of Orbost, through the southern Errinundra and Kuark forests, and all the way to the coastal forests of Croajingolong National Park, this area includes core habitat for threatened species such as the Long-footed Potoroo and Greater Glider. The area also includes a large proportion of the Immediate Protected Areas (IPAs as well as the Sea to Summit Forest Trail, a unique walking track being developed for visitors to experience unbroken forest from East Gippsland's alpine environments through to its coastline.

Unfortunately, a vast majority of the areas set aside for the Sea to Summit track and IPAs suffered extensive bushfire impacts. Around 90% of the IPAs are within the fire extent.

While most of the Sardine Creek to Bemm area is within the fire extent, some parts have been less severely burnt and are now a critical focus for protection. A significant corridor of unburnt and less severely burnt forests now extends from the Snowy River National Park, through parts of the Martins Creek and Sardine Creek reserves, then through the Murrungower forests south of Kuark, to the state forests north of Bemm River township and Croajingolong National Park by the coast.

This area also comprises a significant part of the distributional range of the Long-footed Potoroo, concentrated in the foothill forests of this part of East Gippsland.

Forests recover from fire, scheduled for logging.

Long-footed Potoroo

The Long-footed Potoroo is a cryptic marsupial preferring wet and damp forest types which support underground fruiting fungi, an essential food source for the Potoroo. The Long-footed Potoroo was seriously impacted by the fires, with over 80% of its modelled habitat affected[33].

The Sardine Creek to Bemm map (Figure 10) concentrates on the Long-footed Potoroo's core range. It shows the extent of the species' affected habitat and, noting the smaller Cabbage Tree Forest inset on the map, illustrates how extensive the bushfire footprint is compared to the smaller areas of key unburnt forests identified in this report.

Despite its importance to the Long-footed Potoroo, there are over 90 forest areas and nearly 4000ha still scheduled for logging in this area.

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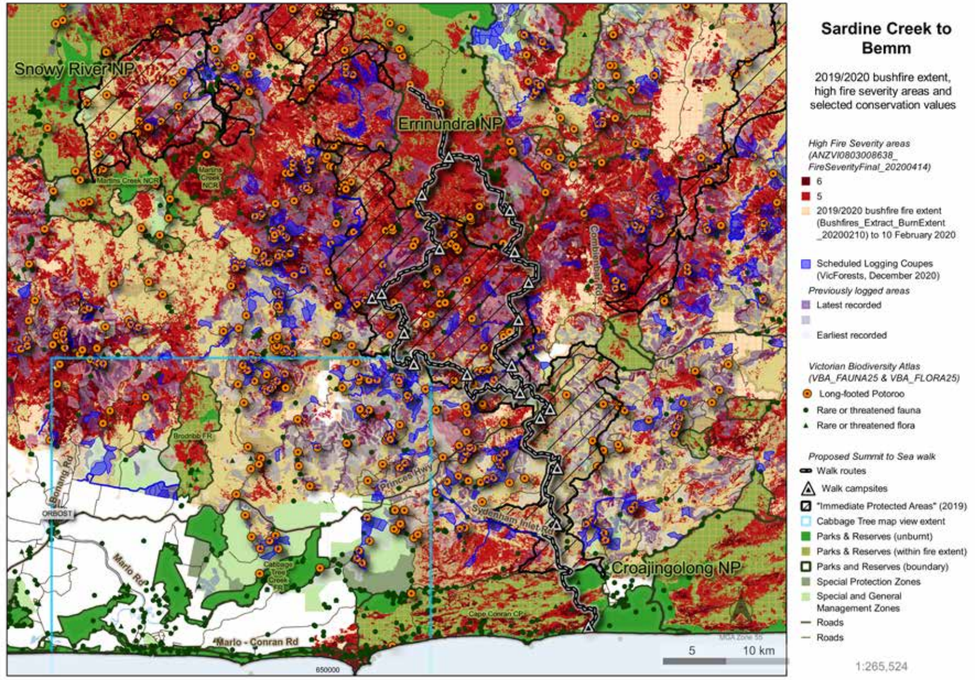

Figure 7: Sardine Creek to Bemm

Far Eastern Forests

Far East Gippsland is a major tourist destination that supports the wider region, bringing vast numbers of holiday makers, especially in the warmer months of the year. The forests in the area are an integral part of the landscape and are significant not only for the people who visit, but for the rare plant and animal species supported by the warmer temperate habitats of East Gippsland found nowhere else in Victoria.

The far eastern forests of East Gippsland extend from the furthest easterly tip of Victoria along the border of NSW, surrounding the townships of Mallacoota and Genoa and include large parts of Croajingolong National Park.

Warm temperate rainforests of Far East Gippsland host rare epiphytic orchids like Tangle and Orange-Blossom Orchids, large rainforest trees like Lilly Pillys, Eastern Leatherwoods and Sandpaper Figs, as well Victoria's rarest tree-fern, the Prickly Tree Fern.

Areas east of the Mallacoota inlet mostly escaped the fires but Mallacoota and the forests to the west of the township were severely fire affected. Much of the forests in the region are within the fire extent but some were far less intensely impacted than other areas in East Gippsland (refer to Figure 8.

Like the Colquhoun region, the forests here are mostly made up of Lowland, Shrubby Dry and Damp Forests which support populations of She-oak – a critical food source for the rare Glossy Black Cockatoo.

Logging was discovered in late November in fire-affected forests in the Maramingo Creek catchment in the far east, despite nearby records of the Glossy Black Cockatoo and recent reports of the presence of multiple Giant Burrowing Frogs found close to where logging has since occurred.

Logging in fire-affected forests is known to have particularly damaging impacts on waterways which support a number of rare species, including the Giant Burrowing Frog.

Logging adjacent to Giant Burrowing frog records in Far East Gippsland.

Glossy Black Cockatoo

The Glossy Black Cockatoo in Victoria is mostly found in far eastern Gippsland. It is the smallest of the black cockatoo species and feeds exclusively on She-oak nuts.

Fire has affected 64% of the Glossy Black Cockatoo's habitat. This is extremely concerning given the species' limited range in Victoria, and the continued threat logging has on the last fragments of the species' best habitat, some of which is within the fire extent, but less severely impacted.

Citizen scientists detected Glossy Black Cockatoo in forests scheduled for logging in Far East Gippsland in April after the bushfires. According to our analysis of the Glossy Black Cockatoo's remaining unburnt modelled habitat, 15% is unprotected and open for logging, while only 13% is unburnt and protected[34]. Forests in the far east, which contain the best habitat for the Cockatoo, must now be protected from logging.

PHOTO: ROHAN BILNEY

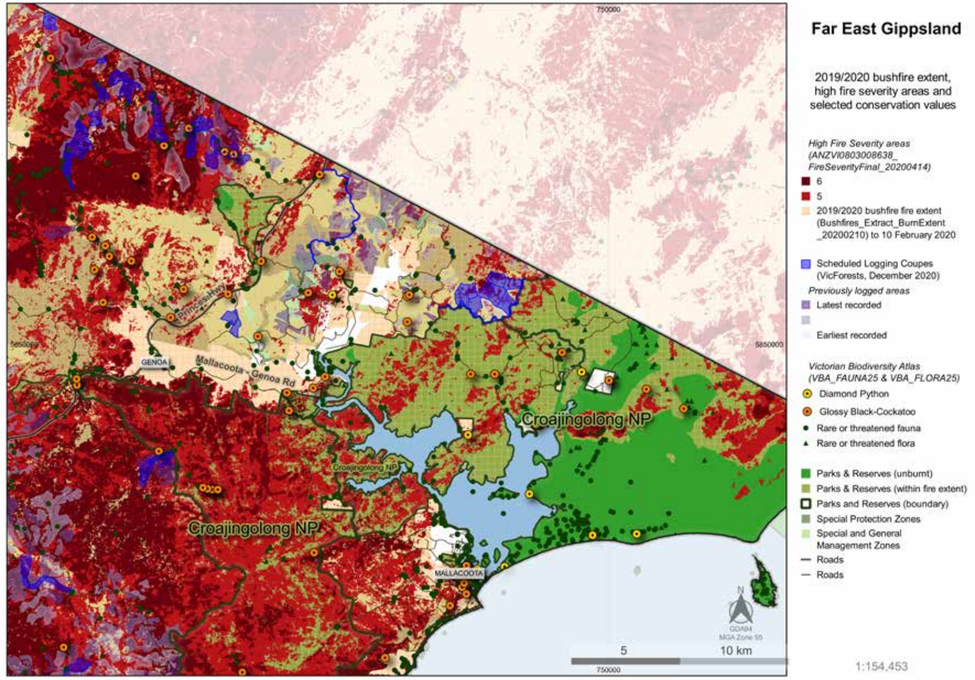

Figure 8: Far East Gippsland

Nunniong

Straddling the East Gippsland and Tambo FMAs and situated north-west of Buchan, the Nunniong region features high mountain plains surrounded by montane wet and damp old growth forests, and important stands of Alpine Ash. The area is incredibly diverse in terms of vegetation types and flora and supports sensitive alpine vegetation communities as well as threatened wildlife like large forest owls.

The core Nunniong forest areas remain mostly untouched by recent wildfires, and like most of the key identified refuge areas it is surrounded by severely and extensively burnt forests.

The Nunniong, Nunnett and Bentley Plains are a network of scenic reserves and unique landscapes that support sensitive alpine vegetation communities such as EPBC-listed sub-alpine grasslands and alpine sphagnum bogs. There are now less than 4300ha of this type of community remaining in Victoria.[35]

The Nunniong forest area supports two significant forest owl species, the Sooty Owl and Powerful Owl.

Much of the area has been subject to intensive logging over the past decades, particularly concentrated in Alpine Ash stands. Logging had already heavily fragmented the area and now 24% of modelled Alpine Ash distribution across East Gippsland is within the fire extent, with 14% of this area subject to high severity fire.[36] Given the significant pressures faced by Alpine Ash dominated forests due to threats from climate change as well as increased fire frequency and severity,[37] remaining Alpine Ash in the Nunniong area must be properly protected from further manageable disturbances.

Yet more than a hundred coupes totalling almost 5000ha of forest is scheduled for logging in this area, the most of any of the key refuge areas. Continued logging threatens critical Alpine Ash forest areas which must be protected to ensure the species survives and can regenerate in eastern Victoria's fragile alpine, subalpine, and montane environments.

Alpine Ash forests scheduled for logging, Nunniong Alpine Ash forests scheduled for logging, Nunniong.

Powerful Owl

The Powerful Owl is Australia's largest forest owl, found in a wide range of forest types. Its conservation status under the EPBC Act is set to be upgraded to endangered.[38]

The Powerful Owl needs large tracts of mature forests with an abundance of hollow bearing trees for roosting, rearing young and supporting a necessary population of prey species. It also needs dense and well vegetated valleys for hunting and roosting.

Habitat modelling shows Nunniong is an incredibly important area for the Powerful Owl. According to the Department's biodiversity report 26% of the Owl's habitat is within the fire extent.

Shockingly, around 63% of the Powerful Owl's unburnt habitat in the Tambo FMA is still available for logging[39]. Protecting the Nunniong area from logging would save critical habitat for the Powerful Owl.

PHOTO: ROHAN BILNEY

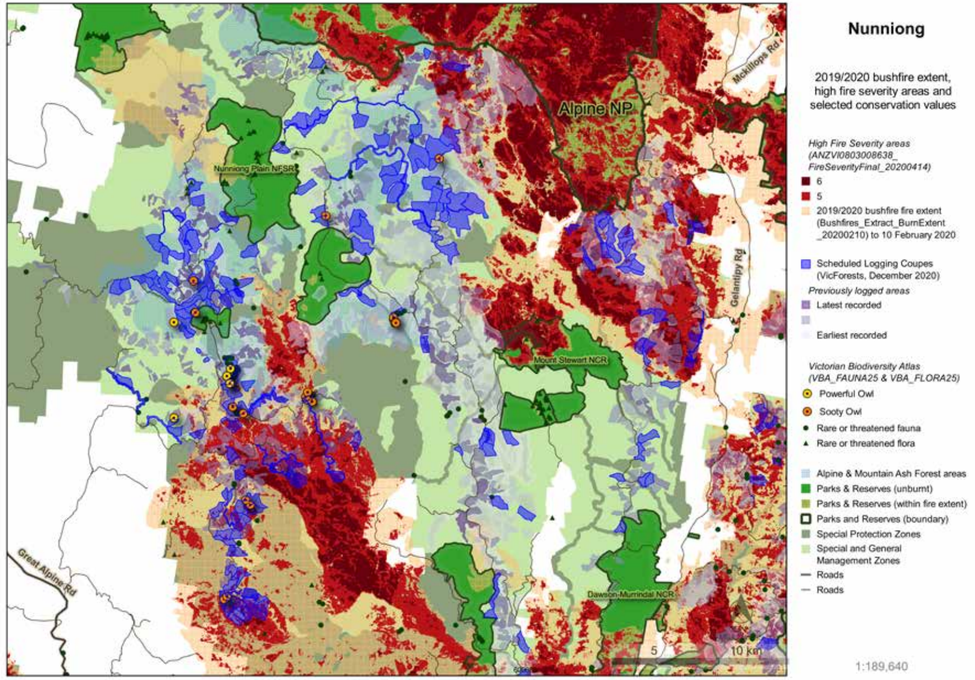

Figure 9: Nunniong

PHOTO: JILL REDWOOD

Key identified refuges in Tambo FMA

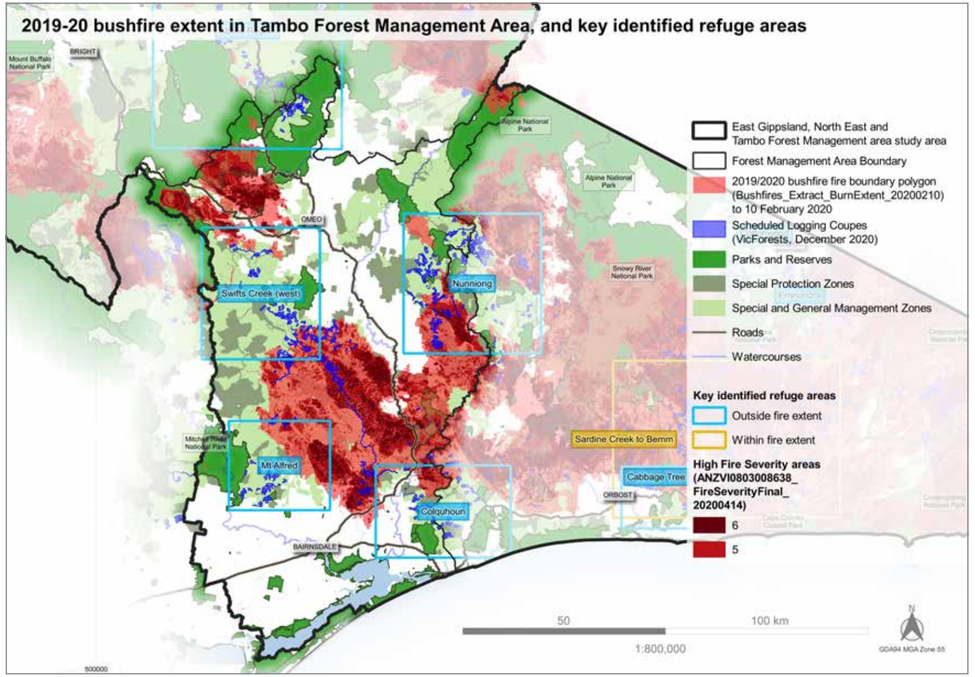

Figure 10: Tambo FMA

Swifts Creek

The forest areas west of Swifts Creek township and south of Omeo stretch from the Angora Range through to Mt Delusion. The higher elevation forests of Swifts Creek support important stands of Alpine Ash and are an important area for the conservation of the species as a refuge from the impacts of climate change and future bushfires.[40] These tall, mature forests provide critical habitat for the Powerful Owl, Sooty Owl and Greater Glider.

The region contains significant Alpine Ash forests in the higher elevation areas and mature drier forests in the lower elevation areas which form part of the Cassilis Historic Area. A significant EVC in the region is Montane Riparian Thicket, which is confined to montane environments and found in sheltered gullies throughout the Mt Delusion area. These montane rainforest-like communities are dominated by tall tea-tree and cool-temperate fern species like Alpine, Lance and Ray Water-ferns.

Logging has recommenced in unburnt forests in the area. The fire-affected parts of Swifts Creek in the Angora Range were some of the first areas where 'salvage logging' operations commenced after the 2019–20 bushfire season. The impacts of salvage logging are particularly damaging. It is regarded as one of the worst forms of logging in terms of impacts to waterways and soil and has long-term impacts on forest recovery. Action must be taken to halt current and scheduled logging in fire-affected areas to allow them to recover.

Even prior to the fires, some intensively logged areas have not recovered, and now extensive areas of Alpine Ash forests appear to have been replaced by weeds and grasses. Stands of Alpine Ash remain on logging plans in the Mt Delusion area west of Swifts Creek.

Many remaining large stands of Alpine Ash forests support hollow-dependent fauna species like the Sooty Owl.

As these fragmented stands of Alpine Ash and other montane species become more isolated and threatened by further bushfires, protecting what remains on the Mt Delusion and Angora Range has become ever more critical, not only for contracting Alpine Ash forests, but as habitat for the Sooty Owl and other species.

Forests in Swifts Creek, logged in late 2019.

Sooty Owl

The Sooty Owl is a handsome, medium-sized owl with a distinctive Tyto family disc-shaped face. Sooty Owls prefer higher elevation wet and damp forests with large hollows to rear young. These can take more than 120 years to form.

Like the Powerful Owl, the Sooty Owl need large tracts of mature forest with an abundance of hollow bearing trees for roosting and supporting prey. Its conservation status is set to be upgraded to endangered.[41]

Both forest owls were affected by the recent bushfires. According to the Department's biodiversity report, almost half of the Sooty Owl's habitat is within the fire extent (47%). Our analysis shows that of the remaining unburnt habitat for the Sooty Owl in the Tambo FMA where Swifts Creek is located, more than half is unprotected and still available for logging[42].

PHOTO: DAVID HOLLANDS

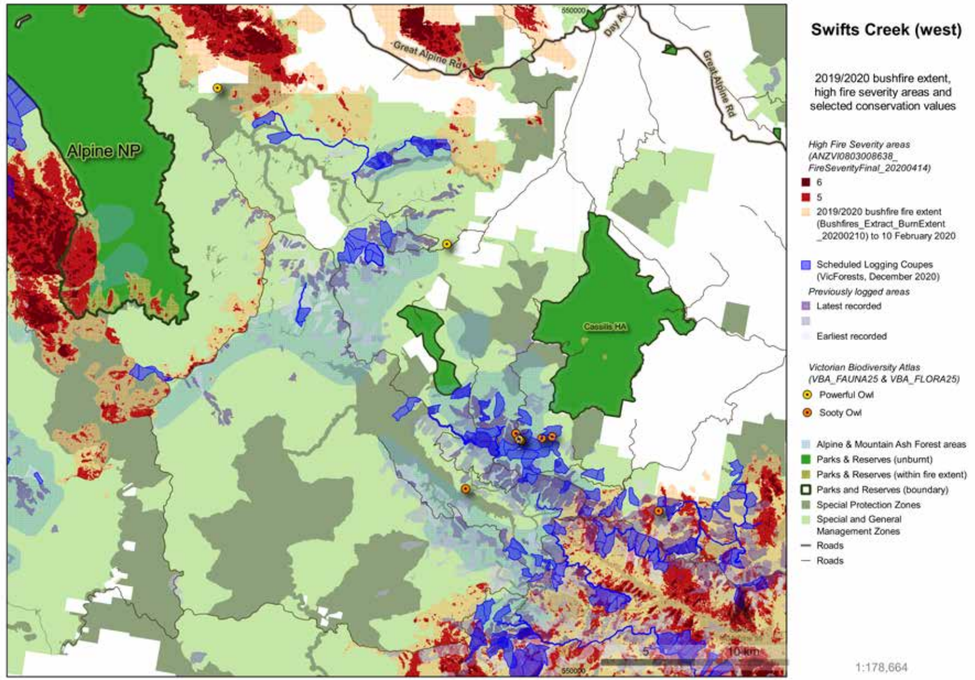

Figure 11: Swifts Creek

Mt Alfred

Mt Alfred is an important area of state forest north-west of Bairnsdale which abuts the Mitchell River National Park and includes the Mount Taylor recreation site. It mostly comprises Damp, Lowland and Herb-Rich Foothill Forest, and significant areas of warm temperate rainforest in the steeper gullies. These beautiful forests attract people from the local community and are an important tourism site for the region.

Mt Alfred is of particular interest for local conservation groups given its close proximity to the town of Bairnsdale and intense logging in the area over the past 40 years.

Situated in the Stony Creek catchment, the area is significant for a range of species, most notably the Giant Burrowing Frog. Mt Alfred is a stronghold for the species, containing a significant breeding population and a large proportion of its identified Victorian habitat. The region is a refuge of high quality unburnt Giant Burrowing Frog habitat but it currently remains unprotected with large areas scheduled for logging.

Important populations of Greater Gliders have also been found in the area.

Intensive logging has already fragmented Greater Glider and Giant Burrowing Frog habitat in the region. While there are some small islands of protected areas in Mt Alfred, past and scheduled logging threatens the connectivity of these reserves, leaving small, isolated and potentially unviable areas within a largely degraded environment.

Extending the small existing protection zones to include Watts Creek and the headwaters of the Flaggy Creek rainforest site would preserve the connectivity of one of the last remaining unburnt areas, which provides habitat for the Giant Burrowing Frog.

Mt Alfred forests, scheduled for logging.

PHOTO: LISA ROBERTS

Giant Burrowing Frog

Found throughout mixed-species forested environments, the Giant Burrowing Frog is one of the least understood amphibian species in Victoria.[43] Very little is known about its habitat requirements, genetics, and niche within the forest ecologies it calls home. Few adults have been recorded in the wild.

The species is currently listed as endangered under federal legislation but is being reassessed as critically endangered. More than 80% of the habitat deemed important for the species is within the fire extent. According to the species' Action Statement, logging and planned burns pose significant risk to the frog's habitat.[44] Only around 17% of the frog's habitat in the Tambo area is unburnt and protected, while 31% is unburnt but unprotected and still available for logging[45].

Logging affects water quality and removes leaf litter and ground cover which provides habitat for the species. Streamside buffers are inadequate for protecting the species, which can be found some distance away from streams and bodies of water.

There are a number of logging coupes scheduled in Watts Creek in the Mt Alfred area where there are known breeding sites for the Giant Burrowing Frog. These should be protected and removed from the TRP.

PHOTO: ROHAN BILNEY

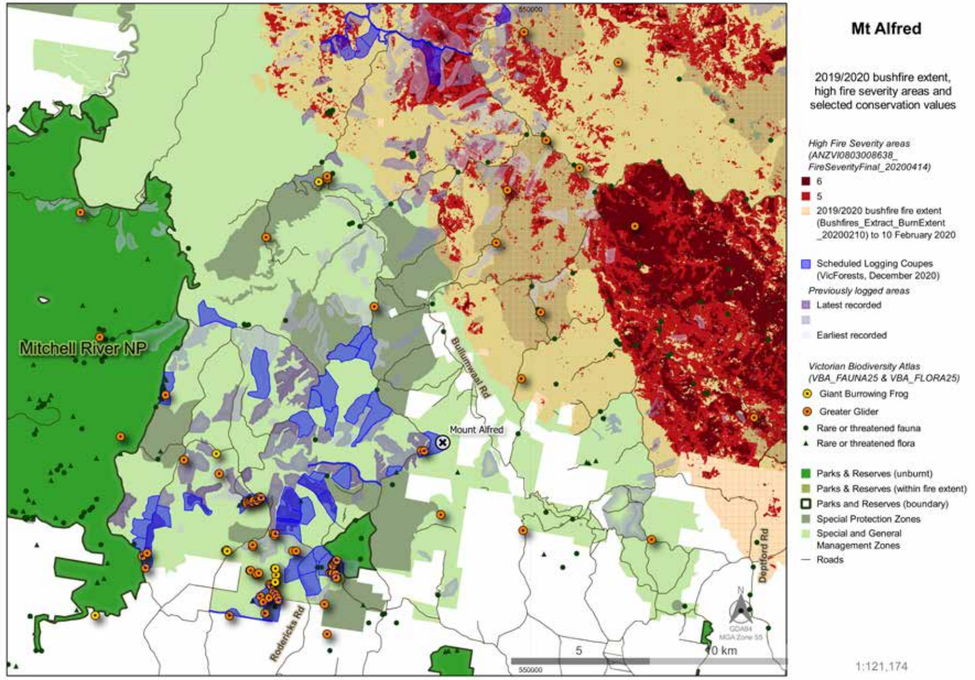

Figure 12: Mt Alfred

PHOTO: LISA ROBERTS

Key identified refuges in North-East FMA

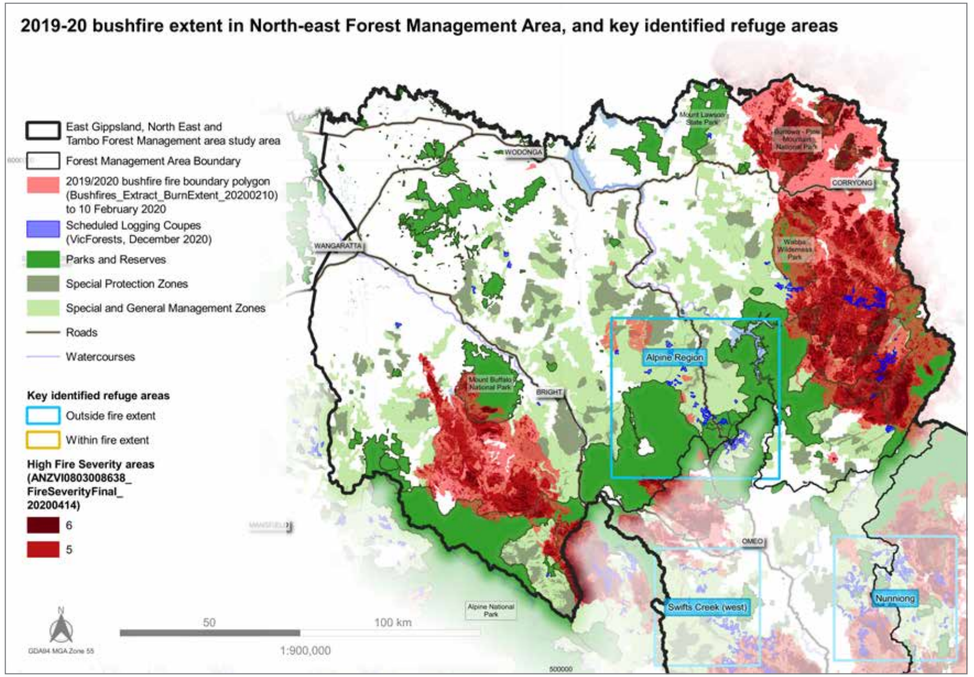

Figure 13: North-East FMA

Alpine Region

The alpine forest region north of Omeo and east of Falls Creek includes the Alpine National Park and the Mt Wills Historic Area as well as surrounding state forests. The region is an iconic and popular tourist destination, close to alpine resorts and host to large parts of the Australian Alps Walking Track. The walk spans over 650km starting at Walhalla near Mt Baw Baw, weaving through the Alpine National Park and Mt Wills Historic Area to Mount Kosciuszko in NSW and on to Canberra.

Despite being a reserve, multiple logging coupes are scheduled in the Mt Wills Historic Area, threatening the integrity of the reserve system. Some of the coupes are directly adjacent to the walking track.

Alpine Ash forests in the area support a number of hollow-dependent species like large forest owls and gliders, as well as surrounding forest vegetation types within the Alpine National park, Mt Wills Historic Area, and surrounding state forest.

While the area largely escaped the 2019–20 bushfires, the region has been affected by past bushfires, and in some places has burnt multiple times. Repeated fires from 2003–2014 have led to large-scale conversion of alpine forest to shrubland'[46].

Over 97% of Alpine Ash distribution burnt in wildfires in 2003, 2006, 2009, 2013, and 2014. In some cases, areas burnt two to three times. While some areas have been aerially reseeded, that is not a long-term sustainable option due to future unavailability of seed. Large stands of Alpine Ash are now at an immature growth stage, incapable of seed production and more vulnerable to being wiped out by future bushfires. They are now highly susceptible to decline due to increasingly hotter and drier conditions.[47]

The Department's bushfire emergency report states that '[b]ecause of vulnerability of this species to multiple burns, areas where this is the dominant tree species are of concern.'[48]

Given the increased risk and severity of bushfires in areas where Alpine Ash occurs, and that these forests are particularly sensitive to a more frequent fire regime,[49] it is critical that immediate action is taken to protect Alpine Ash.

Alpine forests, scheduled for logging.

Hollow-bearing Trees

Tree hollows are a key habitat component for some 300 Australian vertebrate fauna species, of which a third have formal conservation status. Unfortunately, hollow bearing trees are disappearing from forest landscapes due to planned burns, logging, bushfires, and the impacts of climate change.[50] Hollows can take hundreds of years to develop so when areas are logged animals are not only directly affected, but they also lose large swathes of suitable habitat.

Smaller hollows can take at least 80 years to form, while large hollows preferred by forest owls can take up to 220 years.[51] Hollow dependent species require large tracts of surrounding understorey and connectivity of habitat. Intensive logging plans, across all the areas identified within this report leave small numbers of isolated hollow-bearing trees in cleared and degraded landscapes. Logging is having profound impacts, turning large scale areas that once supported diverse forests containing hollow-bearing trees into immature landscapes void of these essential habitat features.

PHOTO: DAVID HOLLANDS

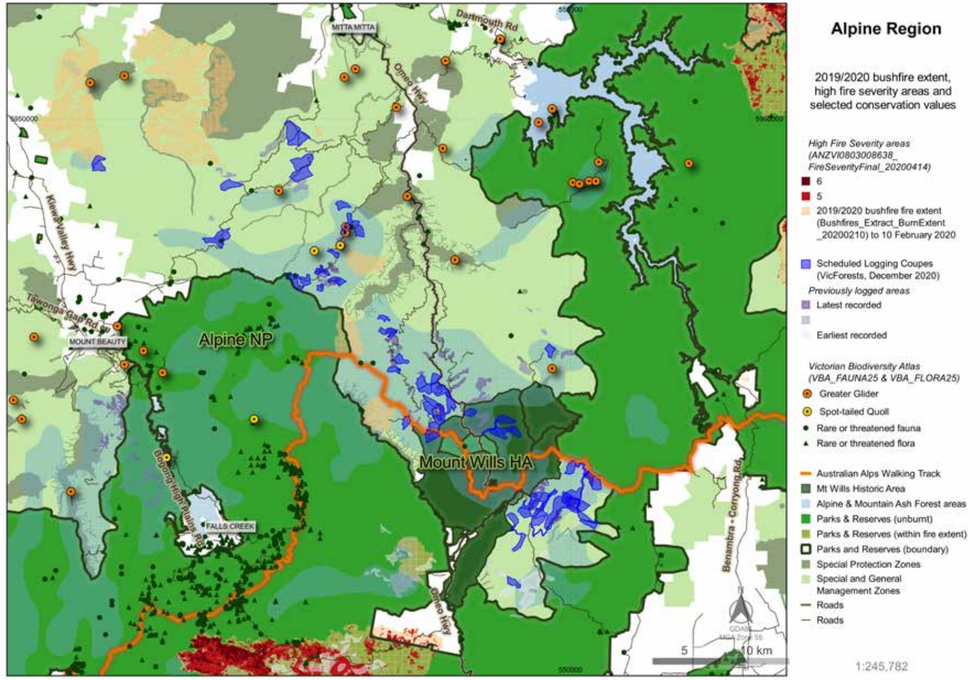

Figure 14: Alpine Region

Discussion

This report has highlighted a selection of the key unburnt and less severely burnt areas that escaped the worst impacts of the 2019–20 bushfires in eastern Victoria. The discussion of these areas in the preceding sections, in the context of a just small selection of many threatened forest fauna and flora, demonstrates how critical it is to protect all unburnt and less severely burnt areas in and near the fire footprint. Yet logging is still scheduled in bushfire-affected threatened species habitat across eastern Victoria, including in the key unburnt, and less severely burnt, refuges identified in this report.

Refuge area	# logging coupes scheduled	Total area (ha)	Select values and findings
Errinundra	59	2117	Mature mixed species wet and damp forests, important habitat for the Greater Glider, Long-footed Potoroo, and large forest owls. Our HIM analysis shows only around 37% of glider habitat is unburnt across the East Gippsland, Tambo and North East FMAs. Just over half of that area is unprotected and still available for logging. ***Critical habitat for Greater Glider, Long-footed Potoroo and large forest owls must be protected from logging. Protection of this area will also assist in preserving the integrity of the cool temperate rainforests Errinundra National Park.***
Cottonwood	40	1228	Higher elevation mixed species wet and damp forests, critical habitat for the Greater Glider, Spot-tailed Quoll, and large forest owls. More than 30% of the quoll's protected habitat across the three fire-affected FMAs has burnt. ***Additional areas must be set aside to ensure the continued survival of this unique but endangered marsupial carnivore. The Cottonwoods contain multiple records of Greater Gliders in areas still scheduled for logging.***
Colquhoun	53	1889	Lowland coastal forests, only known records of Colquhoun Grevillea, and critical habitat for Glossy Black Cockatoo and Masked Owl. Around 80% of habitat deemed important for the Masked Owl was impacted by the bushfires. Only around 10% of the important habitat areas are unburnt and protected. ***Colquhoun is now one of the only extensive unburnt areas of lowland forests and must be protected in its entirety as key habitat for the Glossy Black Cockatoo and Masked Owl.***
Cabbage Tree	25	984	Some of the last remaining unburnt lowlands coastal forests providing important habitat for the Lace Monitor and contains rare warm temperate rainforest species and banksia woodlands. Over 60% of the Lace Monitor's most important modelled habitat in the East Gippsland FMA was impacted by fire. ***Remaining unburnt forests must be protected for the Lace Monitor and to preserve the integrity of rare warm-temperate rainforest stands.***

Table 6: Summary of scheduled logging, key values and findings

Refuge area	# logging coupes scheduled	Total area (ha)	Select values and findings
Sardine Creek to Bemm	96	3779	Large areas impacted by fire with extensive corridors containing lower severity fire. One of the last intact tracts of forest extending from higher elevation alpine forests to the coast and critical habitat for the Long-footed Potoroo. The Long-footed Potoroo was seriously impacted by the fires, with over 80% of its modelled habitat affected. ***This large area of low-severity fire affected lowland forests, still scheduled for logging, are critical for preservation of the Long-footed Potoroo.***
Far East	9	363	Forests less severely impacted by fire supporting endemic plant species usually only found in NSW, and critical habitat for the Glossy Black Cockatoo and Giant Burrowing Frog. Of the Glossy Black Cockatoo's unburnt modelled habitat, around 52% is unprotected and open for logging. ***Logging coupes in the area threaten recent records of Giant Burrowing Frog and some of the only records of Glossy Black Cockatoo in Victoria.***
Nunniong	123	4983	Higher elevation forests dominated by Alpine Ash, some of the last fragments of intact forest in heavily logged areas provide critical habitat for forest owls and gliders. According to our analysis, around 63% of the Powerful Owl's unburnt habitat in the Tambo FMA is still available for logging. ***Scheduled logging in the area threatens some of the last remaining Alpine Ash stands in an already heavily logged area. Protection will safeguard important habitat for the Sooty Owl and Powerful Owl.***
Swifts Creek	67	2238	Mature tracts of wet forests are ideal habitat for Greater Glider, and Sooty and Powerful Owl. Alpine Ash forests have been heavily impacted by fire and logging. Analysis shows that of the remaining unburnt habitat for the Sooty Owl in the Tambo FMA where Swifts Creek is located, more than half is unprotected and still available for logging. ***Small fragments of unburnt, unlogged forests in this area must be protected as habitat for the Greater Glider and large forest owls, especially given the intensive logging history in the area.***
Mt Alfred	34	1339	Lowlands and herb-rich forests, critical habitat for fragmented populations of Greater Glider and Giant Burrowing Frog. More than 80% of the habitat deemed important for the frog is within the fire extent. Around 17% of the frog's habitat within the Tambo area is unburnt and protected, while 31% is unburnt, yet unprotected and still available for logging. ***One of the few remaining unburnt forests with known breeding sites for the rare and soon to be listed as Critically Endangered Giant Burrowing Frog, is still scheduled for logging.***
Alpine Region	47	2221	Area contains sensitive alpine vegetation and large stands of Alpine Ash, vulnerable to higher frequency fire regimes. Despite being a reserve, multiple logging coupes are scheduled within the Mt Wills Historic Area, threatening the integrity of the reserve system. Some of the coupes are directly adjacent to the Australian Alps Walking Track. ***Critical stands of mature Alpine Ash and other montane forests in this alpine region must be protected from logging given the significant risk of increased severity and frequency of bushfire events. Coupes within and adjacent to the Mt Willis Historic Area should be removed from the TRP.***

Table 6: Summary of scheduled logging, key values and findings

Recommendations

Logging is a threat to wildlife and forests over which governments have direct control. The Victorian State Government and land managers must implement the following recommendations to preserve what remains of our native forests and diverse ecosystems, and to safeguard and begin the recovery of threatened species and their habitat after the 2019-20 fires.

1. Protect each of the key refuges identified in this report and any other remaining unburnt forests from current and future logging to ensure the survival and persistence of flora and fauna species that rely on these forests to survive.

   For example, protect the remaining 90,000ha of unprotected state forest in East Gippsland that is outside the fire extent.[52] Further logging in the small unburnt fragments of forest, and in areas impacted by low severity fire, will have dire consequences for threatened flora and fauna that have survived in these areas. Action to protect these areas is in line with DELWP's bushfire response planning.

2. Commit to not logging any identified habitat remaining in Victoria for each threatened species significantly affected by the 2019–20 bushfires, particularly those species listed in this report.

   Many of the species listed in this report are set to have their conservation status upgraded in the next 24 months. Protecting any remaining habitat from logging while this process is undertaken is a critical first step to giving these species the best chance of recovery following the catastrophic bushfires and will help safeguard them against future impacts of bushfires and climate change.

3. Bring forward the 2030 transition out of native forest logging.

a. In November 2019 the Victorian government committed to a decade-long transition out of native forest logging. This timeframe was too slow even before the bushfires and its devastating impact on forests and wildlife. Now there is an even more urgent need to rapidly transition the logging industry out of native forests to remove a key identified threat to the survival of threatened and endangered wildlife.

4. Prioritise funding and restoration of areas impacted by the bushfires to restore habitat and provide better resources for weed and pest control programs in forest areas to improve recovery from bushfire events.

5. Declare and map the key refuges identified in this report as high priority assets in need of protection from all types of future fires, including planned burns.

References

1 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 17

2 Dickman, C. et al. (2020) After the catastrophe: a blueprint for a conservation response to large-scale ecological disaster, Threatened Species Recovery Hub, January 2020, p 5

3 Precautionary measures in timber harvesting post the 2019/20 Victorian bushfires, Regulatory position statement. May 2020. Conservation Regulator Victoria

4 https://www.environment.vic.gov.au/__data/assets/pdf_file/0036/82989/2-NaturePrint-Habitat-Models.pdf&sa=D&ust=1607390790720000&usg=AOvVaw2KP-2WFcv-wOrEmk0OKufR

5 Precautionary measures in timber harvesting post the 2019/20 Victorian bushfires, Regulatory position statement. May 2020. Conservation Regulator Victoria

6 Table 2, p 15

7 https://www.environment.vic.gov.au/__data/assets/pdf_file/0036/82989/2-NaturePrint-Habitat-Models.pdf&sa=D&ust=1607390790720000&usg=AOvVaw2KP-2WFcv-wOrEmk0OKufR

8 Precautionary measures in timber harvesting post the 2019/20 Victorian bushfires, Regulatory position statement. May 2020. Conservation Regulator Victoria

9 Precautionary measures in timber harvesting post the 2019/20 Victorian bushfires, Regulatory position statement. May 2020. Conservation Regulator Victoria, p 2

10 Threatened Species and Communities Risk Assessment, Victoria's Regional Forest Agreements. October 2020. Department of Environment, Land, Water and Planning

11 Dickman, C. et al. (2020) After the catastrophe: a blueprint for a conservation response to large-scale ecological disaster, Threatened Species Recovery Hub, January 2020

12 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 5

13 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 45

14 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 35

15 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 35

16 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 3

17 Department of Environment, Land, Water and Planning (2020) Conservation Status Assessment Project - List of taxa including preliminary Victorian assessments.

18 https://www.environment.vic.gov.au/__data/assets/pdf_file/0036/82989/2-NaturePrint-Habitat-Models.pdf&sa=D&ust=1607390790720000&usg=AOvVaw2KP-2WFcv-wOrEmk0OKufR

19 David B. Lindenmayer, Philip J. Burton, Jerry F. Franklin (2012) Salvage Logging and Its Ecological Consequences. Island Press

20 Precautionary measures in timber harvesting post the 2019/20 Victorian bushfires, Regulatory position statement. May 2020. Conservation Regulator Victoria, pp 6-9

21 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, pp 59-60

22 Errinundra National Park Management Plan, October 1996. Natural Resources and Environment. National Park Service, p 30

23 Flora and Fauna Guarantee - Scientific Advisory Committee, Final recommendation on a nomination for listing, Petauroides volans subs. Volans Kerr 1792 - Greater Glider. March 2017

24 Lindenmayer, D.B. et al. (2010) How to make a common species rare: A case against conservation complacency. Biological Conservation 144 (2011) 1663-1672.

25 Figure A- 6 in the appendix

26 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 84

27 Figure A- 20 in the appendix

28 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 36

29 Figure A- 15 in the appendix

30 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 45

31 Wilson, S., & Swan, G. (2010) A Complete Guide to Reptiles of Australia, Fourth Edition. New Holland Publishers, NSW

32 Figure A- 11 in the appendix

33 Figure A- 13 in the appendix

34 Figure A- 3 in the appendix

35 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 35

36 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 51

37 Bowman, D. M. J. S et al. (2014) Abrupt Fire Regime Change May Cause Landscape-Wide Loss of Mature Obligate Seeder Forests. Glob Chang Biol, vol. 20, no. 3, p. 1008, doi:10.1111/gcb.12433.

38 Threatened Species Scientific Committee, Established under the Environment Protection and Biodiversity Conservation Act 1999 Finalised Priority Assessment List for the assessment period commencing 1 October 2020, p 1

39 Figure A- 17 in the appendix

40 Bowman, D. M. J. S. et al. (2014) Abrupt Fire Regime Change May Cause Landscape-Wide Loss of Mature Obligate Seeder Forests. Glob Chang Biol, vol. 20, no. 3, p. 1008, doi:10.1111/gcb.12433.

41 Threatened Species Scientific Committee, Established under the Environment Protection and Biodiversity Conservation Act 1999 Finalised Priority Assessment List for the assessment period commencing 1 October 2020, p 1

42 Figure A- 19 in the appendix

43 R. Bilney (2015) Observations of Giant Burrowing Frogs Heleioporus australiacus (Limnodynastidae) in the Mitchell River catchment, East Gippsland, Victoria. The Victorian Naturalist, Volume 132 (5), The Field Naturalist Club of Victoria

44 Flora & Fauna Guarantee Action Statement #61 (2003) Giant Burrowing Frog Heleioporus australiacus Department of Sustainability and Environment

45 Figure A- 1 in the appendix

46 Bowman, D. M. J. S, et al. (2014) Abrupt Fire Regime Change May Cause Landscape-Wide Loss of Mature Obligate Seeder Forests. Glob Chang Biol, vol. 20, no. 3, p. 1008, doi:10.1111/gcb.12433.

47 Harris, R.M.B. et al. (2018) Biological responses to the press and pulse of climate trends and extreme events. *Nature Climate Change* 8, 579–587. https://doi.org/10.1038/s41558-018-0187-9

48 Victoria's bushfire emergency: biodiversity response and recovery Version 2 August 2020, Victorian State Government Department of Environment, Land, Water and Planning, p 35

49 Bowman, D. M. J. S. et al. (2014) Abrupt Fire Regime Change May Cause Landscape-Wide Loss of Mature Obligate Seeder Forests. Glob Chang Biol, vol. 20, no. 3, p. 1008, doi:10.1111/gcb.12433.

50 Lindenmayer, D.B. et al. (2012), Interacting Factors Driving a Major Loss of Large Trees with Cavities in a Forest Ecosystem. PLoS One. 7(10): e41864. doi: 10.1371/journal.pone.0041864

51 Lindenmayer, D.B., et al. (2012), Interacting Factors Driving a Major Loss of Large Trees with Cavities in a Forest Ecosystem. PLoS One. 7(10): e41864. doi: 10.1371/journal.pone.0041864

52 Table 2, p 15

Greater Glider in its tree hollow home.

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