P & J SMITH ECOLOGICAL CONSULTANTS



POST-FIRE SURVEY OF ARBOREAL MAMMALS AT WOMBEYAN AND JENOLAN Interim Report



Greater Glider in epicormic regrowth, Blue Mountains NP

Peter Smith and Judy Smith February 2021







Australian Wildlife and Nature Recovery Fund

Summary

As part of the Cores, Corridors and Koalas: Jenolan to Wombeyan Post-fire Assessment project, we are surveying for gliders and other arboreal mammals in areas at Wombeyan and Jenolan that were burnt in the 2019-20 bushfires. In November-December 2020, we carried out spotlighting surveys of six 500 m long transects (three surveys per transect) and also put out wildlife cameras. We plan to repeat the surveys in April-May 2021. All of the transects are in NSW National Parks and Wildlife Service reserves and all are transects for which there is pre-fire survey data on arboreal mammals.

Seven species of arboreal mammals had been recorded on the transects in the pre-fire surveys, including three threatened species: the Greater Glider (*Petauroides volans*), Yellow-bellied Glider (*Petaurus australis*) and Squirrel Glider (*Petaurus norfolcensis*), although the single Squirrel Glider record was a tentative identification of a poorly seen animal and should not be considered a definite record. In our November-December 2020 surveys, about 11 months after the fires, we recorded only three species: Greater Glider, Common Brushtail Possum (*Trichosurus vulpecula*) and Sugar/Krefft's Glider (*Petaurus breviceps/notatus*). The last, formerly considered one species, is now recognised as two separate species, both of which may occur on the transects. However, we did not see any 'Sugar Gliders' well enough to confirm their identity.

The species for which we obtained most data was the Greater Glider, which had been present on all six transects before the fires. Greater Gliders were recorded post-fire on four transects, but none were found in two transects where 100% of the eucalypt foliage had been killed in the fire. In three transects where 44-72% of the eucalypt foliage had been killed, there had been a decline in Greater Glider numbers of about a quarter. In the other transect, where 77% of the eucalypt foliage had been killed, there had been a decline in numbers of about three-quarters.

It was encouraging that Greater Gliders were still present on four transects. The species has a diet of eucalypt leaves and could not be found where virtually all of the eucalypt foliage had been killed in the fire, but they were still present, albeit in lower numbers, in less severely burnt sites where sufficient eucalypt foliage remained to see them through the immediate post-fire period before the trees began reshooting.

Results for another threatened species, the Yellow-bellied Glider, were less encouraging. Our data are limited, since the species had been recorded pre-fire on only one of our transects, but that transect was important, with a large stand of *Eucalyptus viminalis* (Ribbon Gum) trees, many of which were heavily marked by the distinctive feeding scars that Yellow-bellied Gliders make when feeding on the sap. We did not see or hear Yellowbellied Gliders in our three post-fire surveys of this transect, and we could find no fresh (post-fire) feeding scars in this stand of trees.

Our survey results for Greater Gliders can be used to make a broad extrapolation on how this threatened species has fared in the 2019-20 wildfires in the Greater Blue Mountains World Heritage Area as a whole. About one third of this area remained unburnt (including unburnt areas within the fire boundary), while one third was burnt at low to moderate severity, and one third was burnt at high to extreme severity. From our survey results on the effects on Greater Gliders at different fire severities, we estimate that the overall reduction in the Greater Glider population of the World Heritage Area was about 45%. This is a rough estimate based on a small dataset and should be treated with caution, but it gives some idea of the order of magnitude of the loss of Greater Gliders as a result of the fires. Although not totally catastrophic, it has certainly been a massive loss.

The scale of the 2019-20 fires and their impacts in the Greater Blue Mountains World Heritage Area emphasise the importance of the Kanangra-Boyd to Wyangala vegetation corridor and the broader Great Eastern Ranges corridor, of which it forms a part. The Kanangra-Boyd to Wyangala corridor was largely unaffected by the 2019-20 fires and has become an important source from which Greater Gliders and other species can potentially recolonise the heavily burnt World Heritage Area. It typifies what the Great Eastern Ranges conservation initiative is seeking to achieve: reconnecting the landscape along the ranges from Victoria to northern Queensland to stem the loss of native animals and plants, support their movements, and provide opportunities for them to move and adapt in response to the changing climate.

Contents

Summary	1
1. Introduction	3
2. Methods	5
3. Results	7
4. Discussion	10
Acknowledgements	11
References	11
Appendix 1. Survey results	12
Appendix 2. Transect descriptions	18

1. Introduction

As part of the Cores, Corridors and Koalas: Jenolan to Wombeyan Post-fire Assessment project, we have been engaged by the Kanangra-Boyd to Wyangala Conservation Partnership to survey for gliders and other arboreal mammals in conservation reserves at Wombeyan and Jenolan that were impacted by the 2019-20 wildfires, specifically the Green Wattle Creek wildfire. The 2019-20 fire season saw the most extensive fires in Australia's eucalypt forests since European settlement (Boer *et al.* 2020) and the Wombeyan and Jenolan areas were hard hit by these fires. The project is being funded by WWF Australia and the Great Eastern Ranges Initiative.

We are surveying six sites for which we have data on arboreal mammal populations pre-fire. Four of the sites are at Wombeyan (Map 1), including one in Wombeyan Karst Conservation Reserve, one in Mares Forest National Park and two in Blue Mountains National Park. All four sites had been surveyed in December 2016 (Smith and Smith 2017) and the first two had also been surveyed in May 2018 (Smith and Smith 2018). The other two sites are in Jenolan Karst Conservation Reserve (Map 2). Both had been surveyed in January 2003 (DECC 2007) and one had also been surveyed in February 2011 (OEH 2012) and again in November 2018 (P. and J. Smith, K2W Jenolan Caves Bioblitz). All six sites are to be used for long-term monitoring of arboreal mammal populations.

Each site is being surveyed three times in spring-summer 2020 and three times in autumn 2021. The spring-summer surveys have now been completed, including collection of detailed habitat data to assess the value of each site as arboreal mammal habitat and how that habitat value has been impacted by the fires. The results of the spring-summer surveys are presented in this interim report. A final report will be provided when the autumn surveys have been completed.

Page





2. Methods

Spotlight Surveys

Survey methods follow Smith and Smith (2018). Each monitoring site is a 500 m transect along a track through eucalypt forest or woodland. Five points at 125 m intervals along the transect, including the two end points and the centre, have been marked with numbered blue plastic tags attached to the trunks of adjacent trees. The coordinates of the points have been recorded with a GPS receiver.

Surveys at the four Wombeyan sites were carried out over five nights between 13 and 17 November 2020, commencing on four nights at 2000 hours and one night at 2030 hours AEDT, with one to three sites surveyed per night. Surveys at the two Jenolan sites were carried out over three nights between 4 and 11 December 2020, commencing at 2030 hours AEDT, with both sites surveyed each night. Each transect was surveyed by both of us for one hour on three different nights, varying the time at which the survey commenced. Each survey involved us walking together along the track, carrying binoculars and each systematically searching the vegetation on their side of the track with a spotlight.

For every arboreal mammal detected, we recorded the species, the number of animals, their location (GPS coordinates of the corresponding point along the transect centreline, the estimated perpendicular distance from the centreline, and which side of the track), the tree or shrub species in which they were seen, and any observations of feeding behaviour, use of tree hollows, etc. Some animals were detected by call without being sighted. It was not possible to determine the exact locations of these animals.

Gliders were the particular focus of the surveys, but all arboreal mammals were recorded, whatever their distance from the transect centreline. No arboreal mammals were detected beyond a distance of about 60 m. Other nocturnal mammals, birds, reptiles and frogs seen or heard along the transects during the surveys were recorded. We also noted any additional nocturnal species recorded on or near the transects outside the survey times, including records based on indirect evidence such as droppings.

We recorded the weather conditions during each survey, including cloud cover, wind, precipitation, fog and temperature. Cloud cover was recorded as clear (starry sky with few if any clouds), cloudy (partly clear, partly cloudy) or overcast (no stars visible). Wind was recorded as still, light wind (leaves moving), moderate wind (branches moving) or strong wind (whole trees moving). We also noted whether or not the moon was visible and the moon phase.

Wildlife Cameras

To complement the spotlight surveys, we set out two wildlife cameras at each site. At Wombeyan, the cameras were put out on 13 November and collected on 17 November 2020 (i.e. they were out for four nights). At Jenolan, the cameras were put out on 4 December and collected on 11 December 2020 (i.e. they were out for seven nights). Each camera was aimed at a bait container attached to a tree trunk 1.5 to 2 m above ground. The bait was a mixture of peanut butter, oats, honey, olive oil, vanilla essence, almond essence and rosewater. A ball of bait was placed inside a container with holes, allowing the animals to smell the bait but not remove it. Sugar water was sprayed on the trunk around the bait container.

Habitat Measurements

Glider habitat measurements were made at the five marked points along each transect centreline. The 10 nearest trees at each point (five nearest trees on each side of the track) were identified to species. Trees less than a third the height of the tallest trees were not included in the sample. Dead trees were included as a separate category (since they could not always be identified to species). For each tree, we also recorded whether it was a canopy tree (>2/3 the height of the tallest trees) or an understorey tree (1/3 - 2/3 the height of the tallest trees): we estimated how much of the tree's canopy consisted of dead or defoliated branches (to the nearest 10%); whether or not it had live mistletoes; and whether or not it contained hollows that were apparently suitable as den sites for gliders. Each tree was classified as having either no suitable hollows, small hollows suitable for Sugar and Squirrel Gliders, large hollows suitable for Greater and Yellow-bellied Gliders, or both small and large hollows. Each tree was scored for recent epicormic regrowth as 0 (none), 1 (some), 2 (moderate amount) or 3 (large amount). When assessing how much of the tree's canopy was dead or defoliated, we ignored the epicormic regrowth, i.e. we assessed what the condition of the tree would have been immediately after the fires, before any regrowth occurred.

At each point, we recorded what acacia and banksia species were present within 10 m of the point. Acacia sap and banksia flowers are known to be important food sources for several species of gliders. The abundance of each species at each point was scored as 0, 1 (<10 plants within 10 m) or 2 (10 or more plants within 10 m). The scores were summed to provide an index of abundance for each species, with a maximum value of 10.

We measured the height of the tallest tree at each point with a clinometer. This was the tallest tree in the vicinity and not necessarily one of the 10 trees identified to species. We also estimated the tree foliage cover around each point. This is the percentage of the ground shaded by a vertical projection of the leaves and branches of the trees, including both canopy and understorey trees, but not trees less than a third the height of the tallest trees. Tree foliage cover was estimated to the nearest 10%. Other features that we noted at each point included any evidence of recent fire, any evidence of recent tree felling, any plant species in flower that were likely to provide food sources for gliders (eucalypts, acacias, mistletoes and banksias), and any nest boxes. We took two reference photos at each point using an 18 mm lens setting, one photo perpendicular to each side of the track.

From the tree species composition and other habitat features, we classified the vegetation along each transect in terms of Keith's (2004) NSW vegetation classes. The geology of the Wombeyan transects was determined from the Goulburn 1:250,000 geological map (Thomas *et al.* 2013), and the geology of the Jenolan transects from mapping by Branagan *et al.* (2014). We used GIS layers to determine the elevation range along each transect, the distance from human habitation, and the distance from the Greater Blue Mountains World Heritage Area. A fire history GIS layer from NSW National Parks and Wildlife Service, current to December 2020, was used to determine how many fires there have been at each site since 1980, whether they were wildfires or prescribed burns, and the date of the last fire. To assess the landscape context of each transect, we mapped and calculated the extent of native forest and woodland within 1 km of the transect using Google Earth satellite imagery from October 2019 (Wombeyan) and December 2019 (Jenolan) translated to a GIS layer. The satellite imagery predated the fires that burnt the Wombeyan and Jenolan sites in December 2019 and January 2020.



Figure 1. Decline in Greater Glider numbers in post-fire surveys compared with pre-fire surveys. Figures in the columns are the % of eucalypt foliage killed in the fire.

3. Results

The results of the post-fire arboreal mammal surveys at Wombeyan and Jenolan in November-December 2020 are summarized in Table 1 and compared with pre-fire surveys of the same transects between 2003 and 2018. Detailed survey results are provided in Appendix 1. The habitat features of the six survey sites and the impact of the 2019-20 fires are described in Appendix 2.

The species for which we obtained most data was the Greater Glider, which is a threatened species listed under Commonwealth legislation but not yet under NSW legislation. The relationship between Greater Gliders counts (number detected per 500 m; 18 post-fire counts and 14 pre-fire counts) and fire severity (% of eucalypt foliage killed in the fire; pre-fire values 0) was tested using a linear mixed effects model with fire severity as a fixed effect and transect as a random effect. In every transect, the mean count of Greater Gliders post-fire was lower than the mean count pre-fire, with greater declines in the most severely burnt sites. The relationship between Greater Glider counts and fire severity was highly statistically significant (p = 0.00004, likelihood ratio test).

The transects differed markedly in Greater Glider density pre-fire, reflecting differences in habitat quality (Table 1). Greater Glider counts also vary from night to night within a survey period, since some animals are likely to be missed in any one survey, and the number missed varies randomly (Appendix 1). Because of these confounding factors, the best way to isolate fire effects is to consider the percentage change in mean Greater Glider counts post-fire versus pre-fire for each transect (Figure 1).

Greater Gliders were recorded in the post-fire surveys at four of the six transects but none were found in the two transects where 100% of the eucalypt foliage had been killed in the

fire. The species had been present in all six transects before the fire. In three transects where 44-72% of the eucalypt foliage had been killed, the post-fire Greater Glider counts were lower than the pre-fire counts by about a quarter (21-27%). In the other transect, where 77% of the eucalypt foliage had been killed, the post-fire counts were three-quarters (75%) lower (Figure 1).

The second most commonly recorded arboreal mammal species was the Common Brushtail Possum, which was recorded in two of the six transects. In both cases, possum counts were higher after the fire than before (Table 1). Both transects are close to holiday accommodation that was not burnt in the fires and is known to be a favoured habitat for Common Brushtail Possums (Transect 6 is close to Wombeyan Campground and Transect 13 to Jenolan Cottages). The increase in brushtail counts post-fire may be due to animals from the holiday accommodation areas moving into the transects after the fire. Because of the fires and the subsequent pandemic, very few people have used the holiday accommodation areas during 2020, with the result that they have provided fewer sources of food for Common Brushtail Possums than they did before the fires.

Five other arboreal mammal species have been recorded on or near the transects, although the Squirrel Glider, a threatened species listed under NSW legislation but not Commonwealth legislation, was only a tentative identification of a poorly seen animal and should not be considered a definite record. Only one of these five species was recorded in the post-fire surveys: the Sugar/Krefft's Glider. Formerly considered one species, the Sugar Glider has recently been divided into three species, two of which occur in New South Wales (Cremona *et al.* 2020). The most likely to occur on our transects is Krefft's Glider (*Petaurus notatus*), but the Sugar Glider (*Petaurus breviceps sens. str.*), as now more narrowly defined, could also be present. We did not see any 'Sugar Glider' well enough in our post-fire surveys to confirm its identity.

The Feathertail Glider is also now recognised as two separate species, both of which could be present on our transects: the Narrow-toed Feathertail Glider (*Acrobates pygmaeus sens. str.*) and the Broad-toed Feathertail Glider (*Acrobates frontalis*) (Van Dyck *et al.* 2013). The two species can only be distinguished in the hand and which of them occurs on the transects remains unknown.

The Feathertail Glider, Yellow-bellied Glider and Common Ringtail Possum were not recorded on any transect post-fire. These three species were infrequently recorded before the fire and it may be that they will be detected when the transects are resurveyed in autumn 2021. However, the absence of records of the Yellow-bellied Glider is a concern. This is a threatened species listed under NSW legislation but not Commonwealth legislation. Our data for this species are limited. It had been recorded on only one of our six transects, Transect 12, but that transect was important to the species, with a large stand of *Eucalyptus viminalis* (Ribbon Gum) trees showing signs of heavy use by Yellow-bellied Gliders. The gliders were feeding on the sap of these trees and many of the trees were heavily marked by the distinctive feeding scars that they make. We saw no Yellow-bellied Gliders in our three post-fire surveys of Transect 12 and heard no calls (the species calls frequently and its calls are loud and distinctive). Furthermore, we found no fresh feeding scars in this stand of trees, only ones that predated the fire.

Table 1. Summary of arboreal mammal spotlighting results

Post-fire surveys in November-December 2020 (about 11 months after the fire) compared with pre-fire surveys in 2003-18. Figures in the table are the mean number of animals detected per 500 m. The fire severity measure is the % of eucalypt foliage killed in the fire, based on a sample of 50 trees per transect. Transects arranged by increasing fire severity. Reserve: BMN = Blue Mountains National Park; MFN = Mares Forest National Park; JKR = Jenolan Karst Conservation Reserve; WKR = Wombeyan Karst Conservation Reserve. Vegetation class (Keith 2004): ERF = Eastern Riverine Forest; SEW = Southern Escarpment Wet Sclerophyll Forest; SMD = Sydney Montane Dry Sclerophyll Forest; STW = Southern Tableland Wet Sclerophyll Forest. + = recorded outside survey times, (f) = old (pre-fire) feeding signs, ? = tentative identification.

Transect	1	1		5		1	2		6			1	3		1	4
Fire severity (% burnt)	4	4		63		7	2		77			1(00		1(00
Reserve	BN	ИN		MFN		BN	/N		WKR			J۴	(R		J۴	(R
Vegetation class	SE	EW		SMD		SE	W	SMD/STW/ERF		STW				STW		
Survey date	2020	2016	2020	2018	2016	2020	2016	2020	2018	2016	2020	2018	2011	2003	2020	2003
Number of surveys	3	1	3	3	1	3	1	3	3	1	3	1	1	1	3	1
Feathertail Glider					1											1
Greater Glider	14	19.1	5.3	6	9.2	8.7	11	1.3	5	6.3		1	5	4		6
Yellow-bellied Glider						(f)	1.1									
Sugar/Krefft's Glider						0.3		0.3	0.3	+						2
Squirrel Glider									+?							
Common Brushtail Possum								2.3	0.7		0.7					
Common Ringtail Possum									+							1

4. Discussion

The results from the first round of post-fire surveys in November-December 2020 were better than we feared might be the case. In particular, it was encouraging that Greater Gliders were still present on four of our six transects, albeit in lower numbers than before the fire. Not surprisingly, they could not be found on the two transects where virtually all of the eucalypt foliage had been killed in the fire. However, they are still present in less severely burnt sites where sufficient eucalypt foliage remained to see them through the immediate post-fire period before the trees began reshooting (Greater Gliders have a diet that consists almost entirely of eucalypt leaves). There was abundant epicormic eucalypt regrowth in the transects in November-December, 11 months after the fire, and we saw Greater Gliders feeding in this regrowth (front cover photo). It was noticeable, however, that they were mainly seen in trees that still had remnant foliage from before the fire, rather than in trees that had lost all their foliage in the fire, even if the trees were now densely covered in epicormic regrowth (see photos in Appendix 2).

In one of our transects, Transect 11, we observed a small Greater Glider joey at the entrance of a hollow, where it had been left while its mother fed nearby. This is the first Greater Glider breeding season since the fire and it was good to see that breeding was occurring in the burnt vegetation, although it is a reminder of the low reproductive output of the Greater Glider, with only one young produced per adult female per year and not all females breeding in any one year.

Our survey results for Greater Gliders, the species for which we have most data, can be used to make a broad extrapolation on how this threatened species has fared in the 2019-20 wildfires in the Greater Blue Mountains World Heritage Area as a whole. The eight conservation reserves that make up the World Heritage Area have a total area of 1,081,000 ha. About 36% of this area remained unburnt (including unburnt areas within the fire boundary), 5% was burnt at low severity, 26% at moderate severity, and 34% at high to extreme severity (Smith 2020). Our survey results suggest that the reduction in Greater Glider numbers in habitat burnt at high to extreme severity was 100% (based on Transects 13 and 14, where 100% of the eucalypt foliage was killed in the fire), that the reduction in numbers in habitat burnt at moderate severity was 39% (mean for Transects 5, 6 and 12, where 63-77% of the eucalypt foliage was killed in the fire), and that the reduction in numbers in habitat burnt at low severity was 27% (based on Transect 11, where 44% of the eucalypt foliage was killed in the fire).

From these figures, we calculate that the overall reduction in the Greater Glider population of the Greater Blue Mountains World Heritage Area as a result of the 2019-20 fires was about 45%. This is a rough estimate that assumes that fire severity in Greater Glider habitat was the same as for the World Heritage Area as a whole. It also assumes that our small dataset is representative of overall impacts on Greater Gliders across the World Heritage Area. The figure of 45% should be treated with caution but it gives some idea of the order of magnitude of the loss of Greater Gliders as a result of the fires. Although not totally catastrophic, it has certainly been a massive loss.

The scale of the 2019-20 fires and their impacts in the Greater Blue Mountains World The scale of the 2019-20 fires and their impacts in the Greater Blue Mountains World Heritage Area emphasise the importance of the Kanangra-Boyd to Wyangala vegetation corridor and the broader Great Eastern Ranges corridor, of which it forms a part. The Kanangra-Boyd to Wyangala corridor was largely unaffected by the 2019-20 fires and has become an important source from which Greater Gliders and other species can potentially recolonise the heavily burnt World Heritage Area. It typifies what the Great Eastern Ranges

conservation initiative is seeking to achieve: reconnecting the landscape along the ranges from Victoria to northern Queensland to stem the loss of native animals and plants, support their movements, and provide opportunities for them to move and adapt in response to the changing climate.

Acknowledgements

We gratefully acknowledge the assistance of Mary Bonet of K2W Inc, who administered the project and provided us with wildlife cameras, and David Smith, Corin Smith and Lawrie Dunn of NSW National Parks and Wildlife Service, who provided accommodation at Wombeyan and gave us a lot of useful information about the 2019-20 fires and their impact on the local wildlife.

References

- Boer, M. M., Resco de Dios, V. and Bradstock, R. A, (2020). Unprecedented burn area of Australian mega forest fires. *Nature Climate Change* **10**, 171-172.
- Branagan, D.F., Pickett, J. and Percival, I.G. (2014). Geology and geomorphology of Jenolan Caves and the surrounding region. *Proceedings of the Linnean Society of NSW* **136**, 99-130.
- Cremona, T., Baker, A.M., Cooper, S.J.B., Montague-Drake, R., Stobo-Wilson, A.M. and Carthew, S.M. (2020). Integrative taxonomic investigation of *Petaurus breviceps* (Marsupialia: Petauridae) reveals three distinct species. *Zoological Journal of the Linnean Society* 20: 1-25.
- DECC (2007). *Terrestrial Vertebrate Fauna of the Greater Southern Sydney Region*. *Volume 1. Background Report*. NSW Department of Environment and Climate Change, Sydney.
- Keith, D. (2004). Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT. NSW Department of Environment and Conservation, Hurstville.
- OEH (2012). *The Vertebrate Fauna of the Jenolan Karst Conservation Reserve*. NSW Office of Environment and Heritage, Department of Premier and Cabinet, Sydney.
- Smith, J., Smith, P. and Smith, K. (2019). *Native Fauna of the Greater Blue Mountains World Heritage Area*. P. and J. Smith Ecological Consultants, Blaxland.
- Smith, P. (2020). Impact of the 2019-20 fires on the Greater Blue Mountains World Heritage Area – final report. Report to Blue Mountains Conservation Society, April 2020. P. and J. Smith Ecological Consultants, Blaxland.
- Smith, P. and Smith, J. (2017). Reconnaissance survey of arboreal mammal populations in the Wombeyan-Wiarborough area. Report to K2W Link Glideways Program, January 2017. P. and J. Smith Ecological Consultants, Blaxland.
- Smith, P. and Smith, J. (2018). Monitoring of arboreal mammals in the Kanangra to Wyangala corridor: baseline surveys of six transects in May 2018. Report to K2W Glideways Partnership and Foundation for National Parks and Wildlife, July 2018. P. and J. Smith Ecological Consultants, Blaxland.
- Thomas, O.D, Pogson, D.J., Johnston, A.J., Scott, M.M., Warren, A.Y.E., Sherwin, L., Colquhoun, G.P., Watkins, J.J., Cameron, R.G., MacRae, G.P., Glen, R.A. and Vassallo, J.J. (2013). *Goulburn 1:250 000 Geological Sheet SI/55-12, Second Edition*. Geological Survey of New South Wales, Maitland.
- Van Dyck, S., Gynther, I. and Baker, A. (eds) (2013). *Field Companion to the Mammals of Australia*. New Holland Publishers, Sydney.

Appendix 1. Survey results

Table 2. Spotlighting results for Transect 5, Oak Range Trail, Mares Forest NationalPark

Results from the 2020 post-fire survey (about 10.5 months after the fire) compared with pre-fire surveys in May 2018 (Smith and Smith 2018) and December 2016 (Smith and Smith 2017). An estimated 63% of the eucalypt foliage at this site was killed in the fire. Figures in the table are the number of animals detected per 500 m. s = seen, h = heard, d = droppings, t = tracks, a = carcass, c = camera records, ^T = threatened species, * = introduced species, X = recorded on or near transect outside survey times

	2020 2018							2016	
Date	13/11/20	14/11/20	15/11/20	Mean	28/5/18	29/5/18	30/5/18	Mean	16/12/16
Start time (AEDT)	2230	2120	2000		1843	2123	1900		2245
Duration (minutes)	60	60	60		60	60	60		55
Transect length (m)	500	500	500		500	500	500		490
Arboreal mammals									
Feathertail Glider Acrobates frontalis/pygmaeus									1s
^T Greater Glider <i>Petauroides volans</i>	5s⁺	7s	4s	5.3	8s	3s⁺	7s	6	9.2s
Other mammals									
Common Wombat Vombatus ursinus				d					
Eastern Grey Kangaroo Macropus giganteus				Xs					
Red-necked Wallaby Macropus rufogriseus				Xc					
Microbats	s	s	s	s		s		s	s
*Goat Capra hircus				t					
*European Rabbit Oryctolagus cuniculus				d					
*Pig Sus scrofa								а	
Nocturnal birds									
Australian Owlet-nightjar Aegotheles cristatus									
Southern Boobook Ninox novaeseelandiae	h	h	h	h					h
Frogs									
Common Eastern Froglet Crinia signifera									h

Includes one likely but unconfirmed sighting

Date	Weather conditions
13/11/20	Clear, still to light wind, raining earlier today, 12°C, no moon
14/11/20	Clear, still, 13°C, no moon
15/11/20	Clear, still, 18°C, no moon
28/5/18	Cloudy, still to light wind, 10°C, full moon
29/5/18	Overcast, moderate wind, light rain, 9°C, full moon visible through cloud
30/5/18	Clear, moderate to strong wind, 4°C, full moon
16/12/16	Cloudy, still, some fog, lot of rain earlier, 16°C, no moon visible

Table 3. Spotlighting results for Transect 6, quarry track, Wombeyan KarstConservation Reserve

Results from the 2020 post-fire survey (about 10.5 months after the fire) compared with pre-fire surveys in May 2018 (Smith and Smith 2018) and December 2016 (Smith and Smith 2017). An estimated 77% of the eucalypt foliage at this site was killed in the fire. Figures in the table are the number of animals detected per 500 m. s = seen, h = heard, c = camera records, ^T = threatened species, X = recorded on or near transect outside survey times, ? = tentative identification

	2020					20	2018			
Date	14/11/20	15/11/20	17/11/20	Mean	28/5/18	29/5/18	30/5/18	Mean	13/12/16	
Start time (AEDT)	2250	2300	2000		2015	1943	2038		0110	
Duration (minutes)	60	60	60		60	60	60		55	
Transect length (m)	500	500	500		500	500	500		635	
Arboreal mammals										
^T Greater Glider <i>Petauroides volans</i>	1s	2s	1s	1.3	8s	2s	5s	5	6.3s	
Sugar/Krefft's Glider Petaurus breviceps/notatus			1s	0.3	1s			0.3	Xh	
^T Squirrel Glider <i>Petaurus norfolcensis</i>								Xs?		
Common Brushtail Possum Trichosurus vulpecula	1s	3s	3s	2.3	1s		1s?	0.7		
Common Ringtail Possum Pseudocheirus peregrinus								Xs		
Other mammals										
Common Wombat Vombatus ursinus				Xc						
Eastern Grey Kangaroo Macropus giganteus	S			S				Xs	Xs	
Red-necked Wallaby Macropus rufogriseus				Xs						
Swamp Wallaby Wallabia bicolor		S		S						
Microbats			s	S		s		S		
Nocturnal birds										
Tawny Frogmouth Podargus strigoides	h			h						
White-throated Nightjar Eurostopodus mystacalis			h	h						
Southern Boobook Ninox novaeseelandiae	h	h	h	h						
Frogs										
Brown-striped Frog Limnodynastes peronii				Xh						
Spotted Grass Frog Limnodynastes tasmaniensis				Xh						
Common Eastern Froglet Crinia signifera				Xh						
Bleating Tree Frog Litoria dentata	h	h		h						
Peron's Tree Frog Litoria peronii		h	h	h						

Date	Weather conditions
14/11/20	Clear, still,12°C, no moon
15/11/20	Clear, still, 16°C, no moon
17/11/20	Overcast, light wind, mist forming, no moon
28/5/18	Cloudy becoming clear, still, 10°C, full moon
29/5/18	Overcast, still, some light rain, 9°C, no moon visible
30/5/18	Clear, light to strong wind, 5°C, full moon
13/12/16	Clear, still, 18°C, full moon

Table 4. Spotlighting results for Transect 11, Langs Road at Range Trail junction, BlueMountains National Park

Results from the 2020 post-fire survey (about 10.5 months after the fire) compared with a pre-fire survey in December 2016 (Smith and Smith 2017). An estimated 44% of the eucalypt foliage at this site was killed in the fire. Figures in the table are the number of animals detected per 500 m. s = seen, h = heard, ^T = threatened species, X = recorded on or near transect outside survey times

		2020								
Date	13/11/20	14/11/20	16/11/20	Mean	14/12/16					
Start time (AEDT)	2115	2000	2145		2150					
Duration (minutes)	60	60	60		50					
Transect length (m)	500	500	500		341					
Arboreal mammals										
^T Greater Glider <i>Petauroides volans</i>	12s	12s	18s⁺	14	19.1s					
Other mammals										
Common Wombat Vombatus ursinus				Xs						
Microbats	S	S		S	S					
Nocturnal birds										
Southern Boobook Ninox novaeseelandiae	S	h	h	S						
Frogs										
Brown-striped Frog Limnodynastes peronii			h	h						
Peron's Tree Frog Litoria peronii	h		h	h						

⁺ Includes one small juvenile

Date	Weather conditions
13/11/20	Clear, still, raining earlier today, 12°C, no moon
14/11/20	Clear, still, 13°C, no moon
16/11/20	Overcast, light to moderate wind, 16°C, no moon
14/12/16	Overcast, still, spots of rain, 18°C, no moon visible

Table 5. Spotlighting results for Transect 12, Langs Road at Rock Lily Road junction,Blue Mountains National Park

Results from the 2020 post-fire survey (about 10.5 months after the fire) compared with a pre-fire survey in December 2016 (Smith and Smith 2017). An estimated 72% of the eucalypt foliage at this site was killed in the fire. Figures in the table are the number of animals detected per 500 m. s = seen, h = heard, d = droppings, (f) = old (pre-fire) feeding signs, ^T = threatened species, * = introduced species, X = recorded on or near transect outside survey times

		2016			
Date	13/11/20	15/11/20	16/11/20	Mean	14/12/16
Start time (AEDT)	2000	2120	2030		2035
Duration (minutes)	60	60	60		60
Transect length (m)	500	500	500		455
Arboreal mammals					
^T Greater Glider <i>Petauroides volans</i>	9s	9s	8s	8.7	11s
^T Yellow-bellied Glider <i>Petaurus australis</i>				(f)	1.1h
Sugar/Krefft's Glider Petaurus breviceps/notatus		1h		0.3	
Other mammals					
Common Wombat Vombatus ursinus				d	
Eastern Grey Kangaroo Macropus giganteus				Xs	
Microbats	S	S	S	S	S
*Cat <i>Felis catus</i>	s			S	
Nocturnal birds					
Tawny Frogmouth Podargus strigoides		S		S	S
White-throated Nightjar Eurostopodus mystacalis				Xs	
Southern Boobook Ninox novaeseelandiae	h	h		h	S
Frogs					
Eastern Banjo Frog Limnodynastes dumerilii		S		S	
Brown-striped Frog Limnodynastes peronii					h
Smooth Toadlet Uperoleia laevigata	h	h	h	h	
Bleating Tree Frog Litoria dentata	h	h	h	h	
Lesueur's Frog Litoria lesueuri ss				Xh	
Peron's Tree Frog Litoria peronii	h	S	S	S	

Date	Weather conditions
13/11/20	Clear, still to light wind, raining earlier today, 12°C, no moon
15/11/20	Clear, still, 18°C, no moon
16/11/20	Overcast becoming cloudy, moderate to strong wind, 16°C, no moon
14/12/16	Overcast, light wind, 18°C, no moon visible

Table 6. Spotlighting results for Transect 13, Six Foot Track, Jenolan KarstConservation Reserve

Results from the 2020 post-fire survey (about 11 months after the fire) compared with pre-fire surveys in November 2018 (Smith and Smith, K2W Jenolan Caves Bioblitz), February 2011 (OEH 2012) and January 2003 (DECC 2007). An estimated 100% of the eucalypt foliage at this site was killed in the fire. Figures in the table are the number of animals detected per 500 m. Results for 2003 and 2011 only list arboreal mammals. s = seen, h = heard, d = droppings, ^T = threatened species, * = introduced species, X = recorded on or near transect outside survey times

		202	20	2018	2011	2003	
Date	4/12/20	6/12/20	11/12/20	Mean	24/11/18	21/02/11	20/01/03
Start time (AEDT)	2130	2030	2140		2045		
Duration (minutes)	60	60	60		90		
Transect length (m)	500	500	500		500	200	500
Arboreal mammals							
^T Greater Glider <i>Petauroides volans</i>					1s	5s	4s
Common Brushtail Possum Trichosurus vulpecula		1s	1s	0.7			
Other mammals							
Common Wombat Vombatus ursinus				d			
Eastern Grey Kangaroo Macropus giganteus	s			s	S		
Red-necked Wallaby Macropus rufogriseus		S		s	S		
Swamp Wallaby Wallabia bicolor				Xs			
Microbats	s	S		s	S		
*European Rabbit Oryctolagus cuniculus				Xs			
Nocturnal birds							
Tawny Frogmouth Podargus strigoides	h			h			
Southern Boobook Ninox novaeseelandiae	h			h			

Date	Weather conditions
4/12/20	Clear, still to moderate wind, 18°C, no moon
6/12/20	Clear, moderate to strong wind, cold, no moon
11/12/20	Overcast, moderate to strong wind, 7°C, no moon visible

Table 7. Spotlighting results for Transect 14, Six Foot Track, Jenolan KarstConservation Reserve

Results from the 2020 post-fire survey (about 11 months after the fire) compared with a pre-fire survey in January 2003 (DECC 2007). An estimated 100% of the eucalypt foliage at this site was killed in the fire. Figures in the table are the number of animals detected per 500 m. Results for 2003 only list arboreal mammals. s = seen, h = heard, d = droppings, ^T = threatened species, * = introduced species, X = recorded on or near transect outside survey times

		202	20		2003
Date	4/12/20	6/12/20	11/12/20	Mean	20/01/03
Start time (AEDT)	2030	2135	2030		
Duration (minutes)	60	60	60		
Transect length (m)	500	500	500		500
Arboreal mammals					
Feathertail Glider Acrobates frontalis/pygmaeus					1s
^T Greater Glider <i>Petauroides volans</i>					6s
Sugar/Krefft's Glider Petaurus breviceps/notatus					2s
Common Ringtail Possum Pseudocheirus peregrinus					1s
Other mammals					
Common Wombat Vombatus ursinus				d	
Eastern Grey Kangaroo Macropus giganteus				Xs	
Swamp Wallaby Wallabia bicolor				Xs	
*European Rabbit Oryctolagus cuniculus				Xs	
Nocturnal birds					
Tawny Frogmouth Podargus strigoides	h			h	
Southern Boobook Ninox novaeseelandiae	h			h	

Date	Weather conditions
4/12/20	Clear, light wind, 18°C, no moon
6/12/20	Clear, moderate to strong wind, cold, no moon
11/12/20	Overcast, moderate to strong wind, 11°C, no moon visible

Appendix 2. Transect descriptions

Table 8. Tree measurements

Sample of 50 trees per transect (10 trees per sample point). Fire severity scored as the % of each tree's foliage that was killed in the fire (ignoring subsequent epicormic regrowth). Post-fire epicormic regrowth scored for each tree as 0, 1 (some), 2 (moderate) or 3 (abundant), including regrowth at the base of the tree. Tree height and foliage cover are means from the five sample points per transect. Tree foliage cover includes epicormic regrowth and is the % of the ground vertically shaded by tree leaves and branches, including both canopy and understorey trees but not ones less than 1/3 the height of the tallest trees. Large hollows are ones potentially suitable for Greater Gliders and Yellow-bellied Gliders; small hollows are ones potentially suitable for Squirrel Gliders and Sugar Gliders. The assessment was made from the ground and probably overestimates the number of trees with suitable hollows (since we could only see the entrance of the potential hollow, not the interior). Understorey trees are 1/3 to 2/3 the height of the tallest trees; canopy trees are >2/3 the height of the tallest trees. + = additional species present along transect.

Tree measurement	Transect						
Tree measurement	5	6	11	12	13	14	
Fire severity % (mean and range)	63 (0-100)	77(10-100)	44(10-100)	72(10-100)	100 (90-100)	100 (100-100)	
Epicormic regrowth score (mean and range)	1.8 (0-3)	1.8 (0-3)	1.7 (0-3)	1.8 (0-3)	2.4 (0-3)	2.2 (0-3)	
Height (m) of tallest trees (mean and range)	20 (17-22)	27 (23-34)	39 (30-47)	33 (27-36)	27 (26-29)	24 (22-27)	
Tree foliage cover % (mean and range)	22 (20-30)	16 (10-20)	34 (20-40)	24 (10-30)	16 (10-20)	10 (10-10)	
Ratio of canopy to understorey trees	25:25	26:24	34:16	37:13	37:13	39:11	
No. of trees with large hollows	8	1	6	9	4	3	
No. of trees with small hollows	9	6	19	20	7	7	
No. of trees with live mistletoes	0	0	0	0	0	0	
No. of dead trees	6	6	3	5	5	2	
No. of live Acacia falciformis trees		5					
No. of live Allocasuarina littoralis trees		1					
No. of live Casuarina cunninghamiana trees		3					
No. of live Eucalyptus agglomerata trees		4					
No. of live Eucalyptus blaxlandii trees						+	
No. of live Eucalyptus bridgesiana trees		12					
No. of live Eucalyptus dalrympleana trees				1	18	9	
No. of live <i>Eucalyptus elata</i> trees		4					
No. of live Eucalyptus eugenioides trees		1					
No. of live Eucalyptus fastigata trees			27	23	22	38	
No. of live <i>Eucalyptus radiata</i> trees	12		5	15	5	1	
No. of live Eucalyptus sieberi trees	32	14		2			
No. of live Eucalyptus viminalis trees			15	4			

Table 9. Acacia and banksia abundance

Abundance of each species scored at each point as 0 (none within 10 m of point), 1 (<10 plants within 10 m) or 2 (10 or more plants within 10 m) then summed for the five points per transect, giving an abundance index with a maximum value of 10. Almost all the wattle plants were seedlings that had germinated since the fire, although some *Acacia falciformis* in Transect 6 were trees that had survived the fire (Table 8). The banksias were plants that had survived the fires and were reshooting from the base. + = present along transect but not within 10 m of any point.

Species	Transect						
Species	5	6	11	12	13	14	
Acacia falciformis		10	3	1	1	1	
Acacia melanoxylon				+	6	4	
Acacia parramattensis		+					
Acacia terminalis	9			+			
Banksia spinulosa	3						

Table 10. Features of the transects and their surroundings

Reserve: BMN = Blue Mountains National Park; MFN = Mares Forest National Park; JKR = Jenolan Karst Conservation Reserve; WKR = Wombeyan Karst Conservation Reserve. Vegetation class (Keith 2004): ERF = Eastern Riverine Forest; SEW = Southern Escarpment Wet Sclerophyll Forest; SMD = Sydney Montane Dry Sclerophyll Forest; STW = Southern Tableland Wet Sclerophyll Forest. Fire history obtained from National Parks and Wildlife Service records. The forest and woodland % is the proportion of land within 1 km of the transect centreline that is native forest and woodland.

Facture	Transect						
reature	5	6	11	12	13	14	
Reserve	MFN	WKR	BMN	BMN	JKR	JKR	
Vegetation class	SMD	SMD/STW/ERF	SEW	SEW	STW	STW	
Elevation (m)	890-905	605-640	960-970	890-900	1150-1170	1100-1120	
Distance from human habitation (km)	0.8	0.2	0.9	1.4	0.1	0.8	
Distance from GBM World Heritage Area (km)	0.1	0.5	0	0	0	0	
Wildfires since 1980	1	1	1	1	1	1	
Prescribed burns since 1980	1	0	0	0	0	0	
Data of last wildfing	Dec 2019 -	Dec 2019 -	Dec 2019 -	Dec 2019 -	Dec 2019 -	Dec 2019 -	
Date of last wildlife	Jan 2020	Jan 2020	Jan 2020	Jan 2020	Jan 2020	Jan 2020	
Date of last prescribed burn	May 2019						
Forest and woodland within 1 km (%)	94	82	99	99	97	98	
Satellite imagery used for above assessment	Oct 2019	Oct 2019	Oct 2019	Oct 2019	Dec 2019	Dec 2019	

Poin	Latitudo	Longitude			
t	Latitude	Longitude			
5A	-34.284911	149.942520			
5B	-34.285998	149.942020			
5C	-34.286813	149.941609			
5D	-34.287937	149.941205			
5E	-34.288863	149.940394			
6A	-34.299827	149.971857			
6B	-34.299716	149.970771			
6C	-34.299722	149.969277			
6D	-34.299025	149.968258			
6E	-34.297979	149.967518			
11A	-34.259371	149.937730			
11B	-34.259219	149.939083			
11C	-34.259088	149.940209			
11D	-34.259089	149.941565			
11E	-34.259134	149.943042			
12A	-34.272332	149.973095			
12B	-34.271305	149.972501			
12C	-34.270258	149.972077			
12D	-34.269170	149.971827			
12E	-34.267873	149.971390			
13A	-33.790690	150.024017			
13B	-33.791447	150.024878			
13C	-33.791907	150.026009			
13D	-33.792803	150.026574			
13E	-33.793859	150.026915			
14A	-33.797695	150.025675			
14B	-33.798751	150.025712			
14C	-33.799742	150.026279			
14D	-33.800852	150.026595			
14E	-33.801936	150.026601			

Table 11. Coordinates of transect points (GDA94)

Transect 5, Oak Range Trail, Mares Forest National Park

Transect 5 runs along an unsealed vehicle track, Oak Range Trail, from near its junction with Wombeyan Caves Road. The site is a plateau on Siluro-Devonian Mares Forest Volcanics geology at an elevation of 890-905 m. The vegetation class is Sydney Montane Dry Sclerophyll Forest about 20 m tall in which the main tree species are *Eucalyptus sieberi* (Silvertop Ash) and *E. radiata* (Narrow-leaved Peppermint). It was originally a state forest, converted to national park in 2010. Impacts of past logging are evident at the southern end of the transect, where larger trees are sparse and there are many young trees and saplings. The western side of the transect was burnt in a hazard reduction burn in May 2019. The entire transect was burnt around New Year December 2019-January 2020 by the Green Wattle Creek wildfire. The impacts of that fire were most severe on the southern side of the transect. We estimate that 63% of the eucalypt foliage along the transect was killed in the fire. A number of trees have fallen either during or after the fire. A few *Xanthorrhoea australis* (Austral Grass-tree) were flowering in November 2020 and were a potential food source for arboreal mammals.



Photo 1. Northern section of Transect 5 in May 2018, before the hazard reduction burn of May 2019 and the wildfire of December 2019-January 2020. There had been no recorded fires at the site since before 1980, either wildfires or hazard reduction burns.



Photo 2. Northern end of Transect 5 in November 2020, eastern side of Oak Range Trail. Not burnt in May 2019 but severely burnt in December 2019-January 2020



Photo 3. Northern end of Transect 5 in November 2020, western side of Oak Range Trail at the same point as Photo 2. Lightly burnt in the hazard reduction burn in May 2019, which appears to have had a marked effect in reducing the impact of the December 2019-January 2020 wildfire.



Transect 6, Quarry track, Wombeyan Karst Conservation Reserve

Transect 6 runs along an unsealed vehicle track up a gully beside an ephemeral creek (flowing in November 2020) that is a tributary of Wombeyan Creek at an elevation of 605-640 m. The track was badly eroded in the flooding rains of February 2020 and is now impassable to vehicles and barely passable on foot. The track runs between the Wombeyan Caves campground and a long-abandoned marble quarry. The geology is Siluro-Devonian Mares Forest Volcanics. The vegetation is forest about 27 m tall consisting of a mixture of three vegetation classes. The main class is the vegetation of the hillsides. Sydney Montane Dry Sclerophyll Forest, in which the main tree species are *Eucalyptus* sieberi (Silvertop Ash) and E. agglomerata (Blue-leaved Stringybark). Along the creek is a narrow band of Southern Tableland Wet Sclerophyll Forest characterised by E. bridgesiana (Apple Box), which changes downstream, at the eastern end of the transect, to Eastern Riverine Forest characterised by Casuarina cunninghamiana (River Oak) and E. elata (River Peppermint). The entire transect was burnt around New Year December 2019-January 2020 by the Green Wattle Creek wildfire. We estimate that 77% of the eucalypt foliage along the transect was killed in the fire. A number of trees have fallen either during or after the fire. A few Acacia falciformis trees that survived the fire were flowering in November 2020, otherwise no plant species were in flower that were likely to be significant for arboreal mammals. A number of nest boxes of various types were erected along the transect in 2017 and most of these have survived the fire.



Photo 4. Sydney Montane Dry Sclerophyll Forest in Transect 6 in May 2018. There had been no recorded fires at the site since before 1980, either wildfires or hazard reduction burns.



Photo 5. Severely burnt Sydney Montane Dry Sclerophyll Forest in Transect 6 in November 2020.



Photo 6. One of the few patches of lightly burnt Sydney Montane Dry Sclerophyll Forest in Transect 6 in November 2020.



Transect 11, Langs Road at Range Trail junction, Blue Mountains National Park

Transect 11 runs along an unsealed road, Langs Road, east from its junction with the Range Trail. The site is a plateau on Siluro-Devonian Mares Forest Volcanics geology at an elevation of 960-970 m. The vegetation class is Southern Escarpment Wet Sclerophyll Forest about 39 m tall in which the main tree species are *Eucalyptus fastigata* (Brown Barrel) and *E. viminalis* (Ribbon Gum). The entire transect was burnt around New Year December 2019-January 2020 by the Green Wattle Creek wildfire. We estimate that 44% of the eucalypt foliage along the transect was killed in the fire, chiefly in the understorey; most of the canopy foliage survived the fire in this tall forest. There has been some felling of trees along Langs Road for safety reasons. No plant species were in flower in November 2020 that were likely to be significant for arboreal mammals.



Photo 7. Southern Escarpment Wet Sclerophyll Forest in Transect 11 in December 2016. There had been no recorded fires at the site since before 1980, either wildfires or hazard reduction burns.



Photo 8. Lightly burnt Southern Escarpment Wet Sclerophyll Forest in Transect 11 in November 2020.



Photo 9. One of the few patches of moderately burnt Southern Escarpment Wet Sclerophyll Forest in Transect 11 in November 2020.



Transect 12, Langs Road at Rock Lily Road junction, Blue Mountains National Park

Transect 12 runs along an unsealed road, Langs Road, at its junction with Rock Lily Road. The site is a plateau on Siluro-Devonian Mares Forest Volcanics geology at an elevation of 890-900 m The vegetation class is Southern Escarpment Wet Sclerophyll Forest about 33 m tall in which the main tree species are *Eucalyptus fastigata* (Brown Barrel) and *E. radiata* (Narrow-leaved Peppermint), although *E. viminalis* (Ribbon Gum) is the dominant species in a broad depression adjacent to a small dam. The entire transect was burnt around New Year December 2019-January 2020 by the Green Wattle Creek wildfire, which was the first recorded fire at the site, either wildfire or hazard reduction burn, since before 1980. We estimate that 72% of the eucalypt foliage along the transect was killed in the fire. The *E. viminalis* stand, which was an important feeding site for Yellow-bellied Gliders, was burnt severely and we could find no evidence that they have fed there since the fire (i.e. no fresh feeding scars on the trees). Fire severity in the *E. fastigata-E. radiata* forest varied from light to severe along the transect. There has been some felling of trees along Langs Road for safety reasons. No plant species were in flower in November 2020 that were likely to be significant for arboreal mammals.



Photo 10. *Eucalyptus fastigata-E. radiata* forest in Transect 12 in December 2016.



Photo 11. *Eucalyptus viminalis* forest in Transect 12 in December 2016.



Photo 12. Severely burnt *Eucalyptus fastigata-E. radiata* forest in Transect 12 in November 2020.



Photo 13. Lightly burnt *Eucalyptus fastigata-E. radiata* forest in Transect 12 in November 2020.



Transect 13, Six Foot Track, Jenolan Karst Conservation Reserve

Transect 13 runs along a walking track, the Six Foot Track, on a broad ridgetop at an elevation of 1150-1170 m. The geology is Silurian Inspiration Point Formation (interbedded siltstone and sandstone). The vegetation class is Southern Tableland Wet Sclerophyll Forest about 27 m tall in which the main tree species are *Eucalyptus fastigata* (Brown Barrel) and *E. dalrympleana* (Mountain Gum). The entire transect was burnt around New Year December 2019-January 2020 by the Green Wattle Creek wildfire, which was the first recorded fire at the site, either wildfire or hazard reduction burn, since before 1980. We estimate that 99.8% of the eucalypt foliage along the transect was killed in the fire. The transect begins about 100 m from a cluster of holiday cottages and an adjacent clearing, and the immediate vicinity of the cottages was not burnt. A number of trees have fallen either during or after the fire, and others beside the Six Foot Track have been felled for safety reasons, some of them large trees with hollows. No plant species were in flower in December 2020 that were likely to be significant for arboreal mammals.



Photo 14. Southern Tableland Wet Sclerophyll Forest in Transect 13 in September 2018.



Photo 15. Severely burnt Southern Tableland Wet Sclerophyll Forest on the western side of Transect 13 in December 2020.



Photo 16. Severely burnt Southern Tableland Wet Sclerophyll Forest on the eastern side of Transect 13 in December 2020.



Transect 14, Six Foot Track, Jenolan Karst Conservation Reserve

Transect 14 runs along a walking track, the Six Foot Track, on a narrow ridgetop at an elevation of 1100-1120 m. The geology is Silurian Inspiration Point Formation (interbedded siltstone and sandstone). The vegetation class is Southern Tableland Wet Sclerophyll Forest about 24 m tall in which the main tree species are *Eucalyptus fastigata* (Brown Barrel) and *E. dalrympleana* (Mountain Gum). The entire transect was burnt around New Year December 2019-January 2020 by the Green Wattle Creek wildfire, which was the first recorded fire at the site, either wildfire or hazard reduction burn, since before 1980. We estimate that 100% of the eucalypt foliage along the transect was killed in the fire. A number of trees have fallen either during or after the fire, and others beside the Six Foot Track have been felled for safety reasons, some of them large trees with hollows. No plant species were in flower in December 2020 that were likely to be significant for arboreal mammals.



Photo 17. Example of a hollow-bearing tree that has fallen as a result of fire damage.



Photo 18. Severely burnt Southern Tableland Wet Sclerophyll Forest on the western side of Transect 14 in December 2020.



Photo 19. Severely burnt Southern Tableland Wet Sclerophyll Forest on the eastern side of Transect 14 in December 2020.

