

**Environment East Gippsland v VicForests
Supreme Court proceeding number 8547 of 2009**

STATEMENT OF EVIDENCE

Dr Charles Meredith

1 February 2010

1.0 AUTHOR'S STATEMENT

1. Name and address:

Dr Charles Meredith
Biosis Research Pty. Ltd., 38 Bertie Street, Port Melbourne

2. Qualifications and experience:

Dr Meredith holds a Bachelor of Science in Botany and Genetics and a Doctorate of Philosophy in Zoology. He has over 25 years experience in environmental management, flora and fauna survey and management, conservation value assessment, biodiversity issues, and conservation and land-use planning and policy. He has served on a broad range of committees, including the Victorian Coastal Council Expert Panel, the Scientific Advisory Committee to the Flora and Fauna Guarantee Act, the Monash University Department of Biological Sciences Advisory Committee and the Editorial Advisory Board for Groundwork, the quarterly journal of the Australian Minerals & Energy Environment Foundation. Charles is an Inaugural Fellow of the Environment Institute of Australia and New Zealand, and is a Member of the Ecological Society of Australia and the Royal Society of Victoria.

3. Area of expertise:

- biodiversity survey
- rare and threatened species/communities assessment
- rare and threatened species/communities management
- habitat assessment
- sites of significance studies
- conservation issues assessment
- environmental design guidelines
- environmental impact statement – natural environment
- impact minimisation (mitigation) guidelines
- benchmarking – environmental management and practice
- regional environmental planning

4. Expertise to make the report:

Dr Meredith has worked on a broad range of projects relating to East Gippsland and Victoria's fauna and forest ecology, including:

- review of the impacts of timber harvesting on flora and fauna, for the Victorian Timber Industry Inquiry
- assessment of the ecological values of Victoria's river and streams, for the Victorian Environment Assessment Council
- preparation of management plans for Victoria's Heritage Rivers and Natural Catchments, for the Victorian Environment Assessment Council
- ecological assessment of alternative sites for a proposed pulp mill in East Gippsland, for North Limited
- ecological assessment of the proposed Very Fast Train route, Orbost to Bonang section, for VFT Consortium

- ecological and impact assessment for the Eastern Gas Pipeline, Longford-Sydney, for BHP Petroleum
- a study of the arboreal mammals of Chiltern State Park, for Parks Victoria.

5. Instructions defining the scope of the report:

I was commissioned by Bleyer Lawyers on behalf of Environment East Gippsland (EEG) to provide further expert opinion in accordance with the instructions below:

Hollow-bearing Trees

1. Look at Action Statement No 192 “Loss of hollow-bearing trees from Victorian native forests and woodlands”.
 - (a) At page 6 paragraph 7 under the heading “State Forest” the Action Statement refers to “significant areas or stands of hollow-bearing trees”. Is there an agreed or generally accepted standard for determining what constitutes a “significant area or stand”?
 - (b) In a given area, is the extent and or density of hollow-bearing trees a matter of significance? If so what is the significance?
 - (c) What is the significance if any of the presence of hollow-bearing trees for fauna and biodiversity?
 - (d) Based on your report dated April 2009, together with any other material which you consider necessary (but which you must identify in answering this question) what fauna species would you expect to find using hollow-bearing trees in and around the four Brown Mountain Forestry Coupes? Please do not restrict your answer to threatened species.
 - (e) Having regard to the species of tree present in the Brown Mountain Forestry Coupes how long do hollows useable by fauna take to form in those tree species and in the Brown Mountain area?
2. Would the logging of any or all of the four Brown Mountain Forestry Coupes have any impact on the presence of hollow-bearing trees? If so, can you estimate what the level of impact will be?
3. To the extent that you find there to be an impact by reason of the intended logging operations, what period of time would you expect it to take for new hollow-bearing trees to be available for fauna use in the Brown Mountain Forestry Coupes?
4. You are asked to assume that VicForests will, prior to logging any or all of the Brown Mountain Forestry Coupes:
 - (a) create a 100m stream-side buffer for the stream that runs along the eastern boundary of coupe number 840-502-0015;
 - (b) in coupes adjacent to Brown Mountain creek Department of Sustainability & Environment staff with appropriate expertise in biodiversity management will guide the identification of hollow-bearing habitat trees in consultation with VicForests and the harvesting contractors:
 - i) trees with a DBHOB (diameter breast height over bark) greater than 250cm will be retained where it is safe to do so;
 - ii) at least five hollow-bearing habitat trees per hectare will be retained assuming the presence of sufficient numbers and if it is safe to do so;
 - iii) where more than six retained hollow-bearing habitat trees are present in a concentrated area (less than one quarter of a hectare) harvesting machinery should minimise traffic in that area and other trees may be harvested; and
 - iv) harvesting debris and other fuels are to be removed from within 20cm of the base of retained hollow-bearing trees or from around groups of retained hollow-bearing habitat trees to reduce the impact of regeneration burning where it is safe to do so.

Assuming VicForests adheres to the prescriptions in (a) and (b) above, and assuming logging is carried out in any or all of the Brown Mountain Forestry Coupes, would that affect your answers to questions 2 and 3 above? If so, in what way?
5. Given the nature and extent of hollow-bearing trees in the Brown Mountain Forestry Coupes, would they present any issues in relation to the safety of logging operations and those undertaking it?
6. If so, are you able to predict the extent, if any, that hollow-bearing trees within the coupes are likely to be felled because of the safety of logging operations and those undertaking it?
7. What in your opinion is the likelihood that hollow dependent fauna species will use any habitat trees left in the Brown Mountain Forestry Coupes as a result of the application of the habitat tree prescriptions referred to in paragraph 4 above.

8. What factors affect whether hollow dependent fauna species will use remaining habitat trees after logging? Are some species more likely to use retained trees after logging and if so which species and why?

Your Report of April 2009

9. On the assumption that the 4 proposed Brown Mountain Forestry Coupes are logged in accordance with the modified prescriptions referred to in paragraph 4 above, would any or all of the Brown Mountain Forestry Coupes still be critical habitat for any of the species mentioned in your Report?
10. We refer you to the February 2009 bushfires in Victoria. Do the nature, extent and consequences of those fires and in particular any effect they may have had on the habitat of any of the species covered in your Report affect your opinion about whether the habitat identified in your Report is more or less critical for those species? Attached to this letter is a map of the State of Victoria which identifies the fires in 2009 and the areas in Victoria in which each of these fires burned.
11. We refer you to the alteration of the rules about land clearing where the government recently announced interim planning provisions to simplify residents' entitlements to clear native vegetation around their homes. Attached to this letter is a document produced by the Department of Sustainability and Environment and titled "Making Victoria Fire Ready – Preparing for bushfire". Is the introduction of this rule likely to affect the habitat for any of the species covered in your Report? If yes, does it affect your opinion about the importance of the habitat covered by your Report for those species?

6. Facts, matters and assumptions upon which the report is based:

These are set out in the following report.

7. Documents and other materials taken into account:

These are set out in the following report.

8. Persons carrying out tests or experiments:

The data collection was assisted by Mark Venosta, Nathan Garvey and Katrina Sofo, all of Biosis Research Pty. Ltd..

9. Summary of the opinion of the expert:

My opinions are set out in the following report.

10. Statement identifying any provisional opinions:

There are no provisional opinions.

11. Statement identifying any questions falling outside the expert's expertise; statement indicating whether the report is incomplete or inaccurate in any respect.

This report does not address any questions falling outside my expertise and I do not believe the report is incomplete or inaccurate in any respect.

Declaration

Acknowledgement of Expert Witness Code of Conduct

I acknowledge that I have read the Expert Witness Code of Conduct (Rule 44.01) and I agree to be bound by it.

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Court.



Dr Charles Meredith
1 February 2010

2.0 EVIDENCE

2.1 Hollow-bearing Trees

I discuss each of my instructions below, with each question set out separately.

1. *Look at Action Statement No 192 “Loss of hollow-bearing trees from Victorian native forests and woodlands”.*
 - (a) *At page 6 paragraph 7 under the heading “State Forest” the Action Statement refers to “significant areas or stands of hollow-bearing trees”. Is there an agreed or generally accepted standard for determining what constitutes a “significant area or stand”?*
 - (b) *In a given area, is the extent and or density of hollow-bearing trees a matter of significance? If so what is the significance?*
 - (c) *What is the significance if any of the presence of hollow-bearing trees for fauna and biodiversity?*
 - (d) *Based on your report dated April 2009, together with any other material which you consider necessary (but which you must identify in answering this question) what fauna species would you expect to find using hollow-bearing trees in and around the four Brown Mountain Forestry Coupes? Please do not restrict your answer to threatened species.*
 - (e) *Having regard to the species of tree present in the Brown Mountain Forestry Coupes how long do hollows useable by fauna take to form in those tree species and in the Brown Mountain area?*

There is currently no agreed or generally accepted standard for determining what constitutes a “significant area or stand of hollow-bearing trees”. This is perhaps surprising, given the importance of this criterion in the actions for State forest set out in Action Statement No 192, and therefore also for the application of the Code of Practice for Timber Production, which, for public forests, states that “forest management planning and all forestry operations must comply with measures specified in relevant Flora and Fauna Guarantee Action Statements ...” (Section 2.2.2, p. 21, under the heading Mandatory Actions).

The action refers to identifying significant areas or stands “... using the State Forest Resource Inventory (SFRI) and other relevant information”. The SFRI is a GIS-based forest inventory system that is primarily focused on timber resource data and providing timber harvesting planning tools, but which also contains some biodiversity data. The data collection consists largely of remote-sensing, with ground-truthing at selected sites through on-ground data collection. While the SFRI did not initially incorporate data on tree hollows, it is now able to do this. I reviewed the current information on the SFRI data sets available on the DSE web site, and it would appear that this only relates to recent data collected from ground-truthing sites. While the data from these sites could presumably be outputted, there do not appear to be any methods yet developed for using the various tree stand data types to predict tree hollow occurrence more widely, and there are no outputs relating to assessing areas or stands that are significant in relation to hollow-bearing trees.

There are some data types in the SFRI that would be indicative of the numbers of hollow-bearing tree (e.g. crown form, tree height, old-growth), but these are indirect indicators, and, while one could be confident that areas mapped as old-growth, for instance, had relatively high numbers of tree hollows, the same may also be true of forest areas that do not fit the DSE definition of old-growth.

There has been some modelling work by DSE in relation to Leadbeater’s Possum in the Victorian Central Highlands that aims to assess tree hollow density from aerial photos and to use this information to identify high quality habitat (Habitat Zones 1A and 1B) for this species. This is highly specific work that has not, to my knowledge, been used for other species or in other parts of the State.

Although apparently not implemented in the SFRI, Gibbons and Lindenmayer (2002) discuss a number of ways of using tree stand data to predict tree hollow occurrence.

Hollow-bearing trees provide essential resources to a large range of Australian wildlife, so it follows that the extent and/or density of tree hollows in an area or stand is clearly a factor that would contribute to the ecological significance of an area or stand. Just considering the East Gippsland forests, a large number of bird and mammal species, as well as some, utilise tree hollows for breeding, roosting or denning. If tree hollows are absent, or present in only low numbers, they become a critical limiting resource for these species. Tree hollows only form in older trees and there has been a massive reduction in tree hollow availability through land clearing and through the creation of large areas of younger aged forests through timber harvesting and silvicultural management since European settlement. This general loss of tree hollows means that any areas that still retain high levels of hollows are of even greater significance.

The Action Statement provides an excellent summary of hollow use by Victorian fauna species:

“Hollows are considered essential for 16 species of mammal and 44 species of bird in Victoria ... including 14 mammals and birds considered threatened in Victoria The Tree Goanna Varanus varius is also dependent upon hollows for shelter”

Hollows are also used opportunistically by at least 17 species of mammal”

Based on the species lists reviewed for my earlier report (Meredith 2009), the following species that are known to occur in the Brown Mountain area require the presence of tree hollows:

Scientific Name	Common Name
Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo
Callocephalon fimbriatum	Gang-gang Cockatoo
Cacatua galerita	Sulphur-crested Cockatoo
Eolophus roseicapilla	Galah
Alisterus scapularis	Australian King-Parrot
Platycercus elegans	Crimson Rosella
Dacelo novaeguineae	Laughing Kookaburra
Todiramphus sanctus	Sacred Kingfisher
Hirundo nigricans	Tree Martin
Artamus superciliosus	White-browed Woodswallow
Artamus cyanopterus	Dusky Woodswallow
Cormobates leucophaeus	White-throated Treecreeper
Climacteris erythrogastra	Red-browed Treecreeper
Pardalotus punctatus	Spotted Pardalote
Pardalotus striatus	Striated Pardalote
Trichosurus vulpecula	Common Brushtail Possum
Trichosurus cunninghami	Mountain Brushtail Possum
Petauroides volans	Greater Glider
Petaurus australis	Yellow-bellied Glider
Petaurus breviceps	Sugar Glider
Acrobates pygmaeus	Feathertail Glider
Cercartetus nanus	Eastern Pygmy-possum
Tadarida australis	White-striped Freetail Bat
Nyctophilus gouldi	Gould's Long-eared Bat
Nyctophilus geoffroyi	Lesser Long-eared Bat
Chalinolobus gouldii	Gould's Wattled Bat
Chalinolobus morio	Chocolate Wattled Bat
Falsistrellus tasmaniensis	Eastern False Pipistrelle
Vespadelus regulus	Southern Forest Bat
Vespadelus vulturinus	Little Forest Bat
Vespadelus darlingtoni	Large Forest Bat

This list is derived from the records in the Atlas of Victorian Wildlife database for the general Brown Mountain area, as defined as the Study Area in Meredith (2009). It is not expected that all these species would actually occur in any one forest stand in the area, although many would. On the other hand, there are likely to be some other hollow-using species that have not been recorded in the area in surveys but which do occur there.

Trees hollows may begin to form in eucalypts at 25-40 years old, but hollows of a size that is able to be utilised by vertebrates do not appear until trees are much older (Gibbons and Lindenmayer 2002). In forests of the type found around Brown Mountain, large hollows typically take 120-150 years and are not frequent until even older ages (200 plus years). Notably, the planned rotation age for timber harvesting in these forests is generally no longer than 80 years.

2. *Would the logging of any or all of the four Brown Mountain Forestry Coupes have any impact on the presence of hollow-bearing trees? If so, can you estimate what the level of impact will be?*

I have viewed an extensive range of photographs of the four Brown Mountain Forestry Coupes, and the information in the coupe plans provided to me. The coupes are multi-aged in structure, with the presence of very large, mature trees a notable component of the forest. These trees undoubtedly contain hollows suitable for vertebrate fauna (hollows are visible in many photos) and can be expected to contain relatively high densities of these hollows.

If these large trees were removed by logging, then there will be a considerable impact on hollow availability, at a level that would very significantly reduce the value of the coupe areas for hollow-requiring wildlife. If some of these large trees were retained, as would be required by the Code of Forest Practice, then the impact would be reduced to the extent that these trees were retained. However, it is well documented that the survival of retained trees within logging coupes is significantly reduced compared to an unlogged area, so the impact will still be very significant in the medium to long term (Gibbons and Lindenmayer 2002).

Retained trees are susceptible to damage from logging operations and post-harvest burning, or can suffer poor health (Gibbons and Lindenmayer 2002). Such trees are prone to early mortality, especially with repeated exposure to harvesting events over their lifespan.

There will also be some hollows in trees other than the oldest specimens. These are likely to be all removed by logging.

3. *To the extent that you find there to be an impact by reason of the intended logging operations, what period of time would you expect it to take for new hollow-bearing trees to be available for fauna use in the Brown Mountain Forestry Coupes?*

As set out previously, the time taken for the formation of hollows that can be utilised is considerable. If the coupes were never logged again, then large hollows would typically not be present for 120-150 years and are not frequent until even older ages (200 plus years). If, as the current public forest zoning allows, the coupes are regularly logged, then the rotation age of less than 80 years will essentially mean that these lost hollows are never replaced.

4. *You are asked to assume that VicForests will, prior to logging any or all of the Brown Mountain Forestry Coupes:*
- (a) *create a 100m stream-side buffer for the stream that runs along the eastern boundary of coupe number 840-502-0015;*
 - (b) *in coupes adjacent to Brown Mountain creek Department of Sustainability & Environment staff with appropriate expertise in biodiversity management will guide the identification of hollow-bearing habitat trees in consultation with VicForests and the harvesting contractors:*
 - i) *trees with a DBHOB (diameter breast height over bark) greater than 250cm will be retained where it is safe to do so;*

- ii) *at least five hollow-bearing habitat trees per hectare will be retained assuming the presence of sufficient numbers and if it is safe to do so;*
- iii) *where more than six retained hollow-bearing habitat trees are present in a concentrated area (less than one quarter of a hectare) harvesting machinery should minimise traffic in that area and other trees may be harvested; and*
- iv) *harvesting debris and other fuels are to be removed from within 20cm of the base of retained hollow-bearing trees or from around groups of retained hollow-bearing habitat trees to reduce the impact of regeneration burning where it is safe to do so.*

Assuming VicForests adheres to the prescriptions in (a) and (b) above, and assuming logging is carried out in any or all of the Brown Mountain Forestry Coupes, would that affect your answers to questions 2 and 3 above? If so, in what way?

If these prescriptions were adhered to, then the first scenario I discussed (total removal of the largest trees) would not apply but my answer in relation to the second scenario (retention of some trees under the Code) would still apply. It should be noted that every one of these prescriptions is not all that prescriptive, with safety considerations taking priority in (b) (i), (ii) and (iv) [please note that I am not saying that safety should not be the primary consideration, I just note that this will necessarily lead to a reduced outcome for biodiversity], and (b) (iii) is “should” and “minimise”, leaving a lot of scope for not fully meeting this prescription.

- 5. *Given the nature and extent of hollow-bearing trees in the Brown Mountain Forestry Coupes, would they present any issues in relation to the safety of logging operations and those undertaking it?*

It is highly likely that safety issues will compromise the level to which these prescriptions can be met. I am not an expert in workplace safety in relation to forestry operations, but it has been my experience, based on discussions with tree fellers, discussions with coupe auditors, and my own observations of coupes after logging, that, perhaps not unreasonably, fellers do not like to have large old trees in close proximity to other trees that they are felling, due to the potential to snag dead branches or parts of the tree of “poor form”, potentially bringing debris down on them. They are also concerned with working coupes with retained trees where windthrow may occur, endangering anyone working in the area. It is my view that the “it was not safe to do so” approach is frequently taken, with a resulting negative impact on hollow-bearing tree retention. I recall that a number of the trials of alternative silvicultural systems recommended by the Victorian Government Inquiry into the Timber Industry to reduce biodiversity impacts were halted early due to exactly these sort of concerns.

- 6. *If so, are you able to predict the extent, if any, that hollow-bearing trees within the coupes are likely to be felled because of the safety of logging operations and those undertaking it?*

I cannot offer a definitive opinion on the extent that hollow-bearing trees within the coupes are likely to be felled due to safety reasons, but, as discussed above, I believe that there will be some removal of trees for safety reasons.

- 7. *What in your opinion is the likelihood that hollow dependent fauna species will use any habitat trees left in the Brown Mountain Forestry Coupes as a result of the application of the habitat tree prescriptions referred to in paragraph 4 above.*
- 8. *What factors affect whether hollow dependent fauna species will use remaining habitat trees after logging? Are some species more likely to use retained trees after logging and if so which species and why?*

Hollow dependent fauna will continue to use habitat trees that are retained within the coupes to some extent. However, their use will be reduced by a number of factors:

- a) if other habitat requirements are lost due to logging then those fauna will not survive in the area or will decline in numbers; this is likely with those species that are typical of mature or multi-aged forest

- b) there will be an overall loss of hollow resources in the coupe areas, so there will be increased competition for hollows amongst resident fauna
- c) there is likely to be an initial influx into the coupes of species that prefer disturbed habitats or open habitats; where these are hollow-users, there will be increased competition for the hollows.

As the retained trees decline in number due to lowered survivability after logging, the competition for hollows will continue to increase, even as other habitat values improve.

2.2 My Report of April 2009

9. *On the assumption that the 4 proposed Brown Mountain Forestry Coupes are logged in accordance with the modified prescriptions referred to in paragraph 4 above, would any or all of the Brown Mountain Forestry Coupes still be critical habitat for any of the species mentioned in your Report?*

Tree hollows are a critical habitat requirement for the Sooty Owl. A significant reduction in tree hollow numbers or availability would significantly reduce the coupe area's value as part of critical habitat for this species.

The other species discussed are not hollow-dependent, but all would be negatively affected by logging.

10. *We refer you to the February 2009 bushfires in Victoria. Do the nature, extent and consequences of those fires and in particular any effect they may have had on the habitat of any of the species covered in your Report affect your opinion about whether the habitat identified in your Report is more or less critical for those species? Attached to this letter is a map of the State of Victoria which identifies the fires in 2009 and the areas in Victoria in which each of these fires burned.*

The 2009 fires in Victoria were very severe and burnt a large area of forest. Perhaps more importantly, since 2002, large forest fires have burnt most of the Victorian Alps, Central Highlands, Wilsons Promontory and the Grampians – the bulk of Victoria's forests (see Figure 1). East Gippsland's forests had very large fires in the 1980s and, on current trends, can expect very large fires in the future. Each time these large, very hot fires occur (and these are essentially a post-European settlement phenomenon, and, in my view, they will only increase), they cause considerable stress to the native fauna, through massive mortality, loss or alteration of habitat and loss or damage to mature trees.

These mega-fires mean that the few, wet forest refugia are the last to burn. In the past, they burnt very infrequently, but long droughts and extreme temperatures mean that they will now burn more often. The wet forests of East Gippsland are one such refugium. The age of the mega-fire means that the retention of unburnt (even or not severely burnt) habitat becomes much more critical to species' survival and the significance of old-growth resources (including areas such as these coupes that are multi-aged but include old-growth attributes) is greatly increased. The logging of a coupe has many of the negative impacts of a major fire, and so the combination of logging and wildfire in our forests has synergistic effects, increasing the impacts of both.

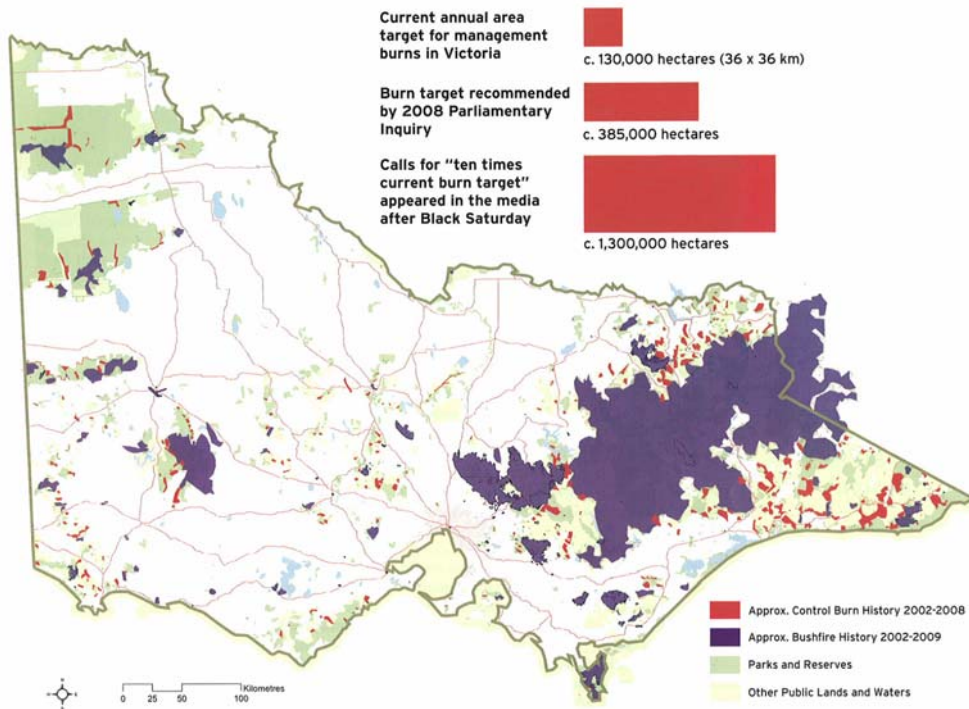
I have noted over the years the practice of foresters is to undertake their planning on the basis that there will be minimal losses of timber resource due to wildfire. This is, of course, never the case. It would appear that planning to minimise impacts on biodiversity is undertaken using the same, and equally erroneous, assumption.

11. *We refer you to the alteration of the rules about land clearing where the government recently announced interim planning provisions to simplify residents' entitlements to clear native vegetation around their homes. Attached to this letter is a document produced by the Department of Sustainability and Environment and titled "Making Victoria Fire Ready –*

Preparing for bushfire". Is the introduction of this rule likely to affect the habitat for any of the species covered in your Report? If yes, does it affect your opinion about the importance of the habitat covered by your Report for those species?

All the species covered in my Report occur largely on public land. I do not believe that any will be impacted by the introduction of these interim planning provisions.

Bushfire and planned burn history since 2002



There has been an almost unprecedented level of fire across Victoria since 2002. The purple areas on this map roughly show the total area affected by bushfires since 2002. The red areas indicate management burns (primarily for fuel reduction) since 2002 (note that small burn areas, and all management burns for 2009, are not included). BASED ON A MAP PREPARED BY DSE, 2009.

Figure 1. Bushfire and planned burn history in Victoria since 2002. Source: Park Watch No. 239, December 2009, p.11.

3.0 REFERENCES

DSE. 2003. *Action Statement No 192. Loss of hollow-bearing trees from Victorian native forests and woodlands*. Department of Sustainability and Environment, Melbourne.

DSE. 2007. *Code of Practice for Timber Production*. Department of Sustainability and Environment, Melbourne.

Gibbons, Philip and Lindenmayer, David. 2002. *Tree Hollows and Wildlife Conservation in Australia*. CSIRO Publishing, Melbourne

Meredith, Charles. 2009. *Assessment of Critical Habitat for Six Species Under the Flora and Fauna Guarantee Act in the Bonang-Goongerah Area, East Gippsland, Victoria*. Biosis Research Pty. Ltd., Melbourne