A Scientific Response to the IFA's Leadbeater's Possum Pamphlet

Australian National University

This document provides a response to the pamphlet published by The Institute of Foresters of Australia. This response is written by scientists at The Australian National University, led by Professor David Lindenmayer. This group of scientists has been studying Leadbeater's Possum and gathering data in the forests of the Central Highlands of Victoria since mid-1983. They have published more than 200 peer-reviewed scientific articles and 8 books on the Victorian Central Highlands and Leadbeater's Possum.

This document sets out the IFA text, and, with compliments to the ABC's Fact Check, our responses. We've included references to the relevant scientific publications on which our responses are drawn.

Leadbeater's Possum, timber harvesting, and the proposed 'Great Forest National Park' - the FACTS

Creating another national park will not help conserve Leadbeater's Possum, contrary to the claims of the environmental groups which are lobbying for it. The possum's greatest threat is widespread bushfire and this will remain the case regardless of whether the area in question is a national park or retains its current mix of public land tenures.

The so-called 'Great Forest National Park' would encompass a massive 525,000 hectares of forest in Victoria's Central Highlands region. If legislated, it would effectively close the State's valuable hardwood industry causing social and economic hardship for several thousand people despite providing no discernible conservation benefit.

The good news is that there is already a range of other strategies that are effectively conserving the Leadbeater's Possum without the need for yet another national park. Our national parks should not be compromised by adding areas that do not appreciably contribute to the current world class reserve system.

We cannot (based on the science) agree with this "good news".

Some Leadbeater's Possum facts:

• Its optimum habitat is tall ash-type mountain forest with large old live or dead nesting trees standing amidst a dense mid-storey of regenerating eucalypt and wattle, but it also occurs in some low woodlands.

This is correct as it is based on 34 years of detailed field research work by scientists at The Australian National University.[1] The key emphasis here should be on the abundance of large old trees. Leadbeater's Possum is totally dependent on large old trees in which it spends 75% of its life.

• A suitable forest structure also arises 15 to 35 years after a major bushfire where there are numbers of remaining live or dead nest trees amongst a regenerating understorey. Recent surveys have found the possum is not uncommon in regrowth derived from the 1983 bushfire and from logging undertaken between 1978 and 2000.

Leadbeater's Possum occurs in regrowth sites but **only** where there are large old trees remaining.

• Within the next decade, the area of suitable Leadbeater's Possum habitat should increase as old forests burnt in the 2009 'Black Saturday' bushfires develop a dense understorey of eucalypt and wattle regrowth. These areas of recently burnt old forest, as well as remaining unburnt stands of old growth forest are already contained in conservation reserves.

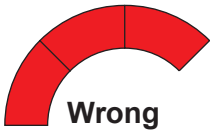
• The Victorian Government's 2013 estimate of the Leadbeater's Possum population is between 4,000 and 11,000 individuals over an area of 560,000 hectares. More recent surveying suggests this may be an underestimate as, since 2015, 218 new Possum colonies have been detected. On these data, the IFA disputes the 'critically endangered' conservation status of the possum.

The estimates in the 2013 report are widely recognized as being inaccurate, in part because the size of the area from which the possums have been drawn in using the call play-back method to attract them is unknown and is not repeatable. More credible estimates are of 2000-4000 animals.[1] However, the most critical part of the viability of any population trend is the change over time. **Long-term time series data collected by The Australian National University shows that populations are declining rapidly in all age classes of montane ash forests.**

The IFA disputes the Critically Endangered status of Leadbeater's Possum, but at no stage has it done any field research, analysis of empirical data, nor any population modelling on which to base its beliefs. **The IFA claims are at odds with all peer-reviewed and published scientific information to date.**

Q: Isn't timber harvesting the greatest threat to the survival of Leadbeater's Possum? NO

- *Most of the ash-type forests (around 70%) preferred by Leadbeater's Possum are already* contained in conservation reserves or closed water supply catchments where timber harvesting is banned.



A detailed ecosystem assessment in montane ash forest[2] shows that 20% of the distribution of Leadbeater's Possum occurs in forests that are formerly reserved. In the remaining 80% of distribution in wood production landscapes, extensive areas have been clearfelled since the 1980s and most were selectively cut before that. **In many landscapes it is easy to see 20, 30 or even more logging coupes that have been clearfelled in the past 5-15 years.** Sections of wood production forest landscapes that are not logged typically include steep and rocky areas and streamside strips which are often unsuitable habitat for Leadbeater's Possum.[3]

- *In the 30% of the ash-type forest where timber harvesting is permitted, the harvested trees are predominantly 77-year old advanced regrowth in which Leadbeater's Possum does not normally nest. Possums are not uncommon in these areas where groups or individual older trees suitable for nesting occur, but they are identified during coupe planning and protected and not cut down.*
- Stands of older trees with hollows suitable arboreal mammal nesting are not harvested - there has been no old growth forest harvesting in this region for around 30-years, and all trees that originated before 1900 are automatically protected.

It is true that some areas of old growth forest – those patches in excess of 5 ha in size – have not been logged since the 1990s. However, patches smaller than 5 ha in size are available for logging. Notably, there are now only 1887 ha of old growth Mountain Ash forest in the entire Central Highlands of Victoria and this is distributed across 147 different patches, with the vast majority of patches being smaller than 5 ha. The lack of old growth forest is a major problem for the conservation of Leadbeater's Possum and the old growth estate needs to be considerably expanded if the species is to have any reasonable chance of survival in the long-term.[4] **The next nearest old growth forest is the 1939 regrowth forest – much of which needs to be fully protected if an increased area of old growth forest is to develop.**

It is wrong to suggest that all trees that originated before 1900 are fully protected. Many hundreds of such trees are badly damaged every year directly during logging operations. In addition, large old trees that are retained are often destroyed during the high-intensity fires that are deliberately lit after logging to regenerate new stands of trees.[5] Recent work by scientists at The Australian National University has shown that the highest abundances of collapsed large old trees are on sites that have been logged in the past 20-30 years.[6]

- *The smallest and most vulnerable colonies of Leadbeater's Possum occur in sub-alpine snow gum woodlands (e.g. Lake Mountain) and lowland woodland (at Yellingbo) which have never been subject to timber harvesting.*

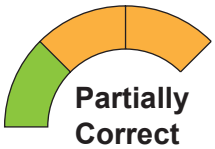
Populations in both areas are at very high risk of extinction. However, populations in the remainder of the distribution of the species are also at high risk of extinction – precisely the reason why the species has been listed by the Australian Government as Critically Endangered. Indeed, the most recent work by The Australian National University shows that **populations of the species are in steep decline in all age classes of montane ash forest.**

Q: Isn't timber harvesting responsible for a lack of old trees with suitable nesting hollows? NO

- The current lack of old trees is primarily due to severe bushfires in 1926 and 1939 which together burnt an estimated 85% of the Central Highlands ash forests, killing most old growth forest and replacing it with regrowth which is now 77-90 years old.

The current lack of large old trees is largely a consequence of more than **120 years of intensive and extensive logging that has removed large areas of former old growth forest and millions of large old trees.** In addition, following major fires in 1939, post-fire salvage logging continued for a further 20+ years in which many fire-damaged large old trees were cut down.

- *Old trees (including dead stags) that had survived the 1939 and 1926 fires and have provided possum nesting hollows since then, have been collapsing (due to natural decay) in significant numbers over the past 20-years, and are now infrequent.*



It is true that large old trees are subject to high rates of natural attrition.[5,6] However, logging has both: (1) directly and indirectly significantly elevated the rate of collapse of large old trees, and (2) substantially impaired the recruitment of large old trees. Each time a site is logged the age of the trees is reset to zero and it takes 120+ years for such trees to develop into large old trees. That is, a tree dating from the 1939 fires requires a further 50 years from now to start developing cavities suitable for occupancy by Leadbeater's Possum; a forest replanted after logging in 2016 will need to grow until 2136AD before the trees are 120 years old.

- More recently, the 2009 'Black Saturday' bush fires killed much of the remaining old growth forest which had been surviving in Melbourne's closed water supply catchments.

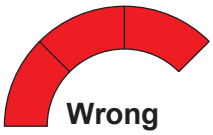
The amount of old growth Mountain Ash remaining in the Central Highland region is just 1.16% of the entire Mountain Ash estate. The situation for Alpine Ash is even worse – just 0.47% is old growth. **A key part of the conservation of Leadbeater's Possum must be to significantly expand the size of the old growth forest estate – close to 30-60% of the region as it was historically.**

- *Timber harvesting of the 1926 and 1939 fire regrowth forests since the mid-1980s has created areas of younger years old. Even if these areas hadn't been harvested, they would now be 77-90 years old, which is still 100 years from becoming old trees with suitable nesting hollows.*

Timber harvesting has indeed created large areas of young regrowth forest. However, such logging operations also rapidly accelerated the rate of loss of living and dead large old trees that formerly occurred in these now logged areas.[6] These large old trees were critical nesting habitat for Leadbeater's Possum but the species is now absent from harvested locations. **Logging has both accelerated the loss of existing large old trees and significantly set back the time until new cohorts of large old trees will develop.**[5]

Q: Wouldn't creating a 'Great Forest National Park' conserve Leadbeater's Possum? NO

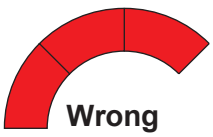
- The Government's Leadbeater's Possum Advisory Group reported in 2014 that it takes around 190 years for ash trees to naturally develop hollows suitable for possum nesting.
- *Trees in these forests that are being harvested for wood products are mostly <90 years old. Even if left to grow in a new national park, it would thus take another 100 years for them to develop hollows suitable for Leadbeater's Possum nesting. Thus new park creation would not be of value to the possum until about 2116.*



Wrong. Detailed modelling analysis by scientists from the Government of Victoria has shown that **a large ecological reserve is critical for the long-term survival of Leadbeater's Possum.**[7] This has been reinforced by more recent work by leading scientists at the University of Melbourne. The new park is essential to protect existing stands of 1939 regrowth which is the next nearest old growth in the Central Highlands region. In addition, the scattered living and dead large old trees within the 1939 regrowth have a significantly greater probability of remaining alive and standing if the area surrounding them is not logged.[6]

Q: But wouldn't a 'Great Forest National Park' benefit Victoria and the local community? NO

- It would close a significant forestry, timber, and wood manufacturing industry which employs several thousand people in regional Victoria and suburban Melbourne. This would have serious economic and social impacts given past experience which suggests that most of these lost jobs would not be replaced by new jobs in national park management or tourism. In addition, even more timber would have to be imported from overseas, where, for the equivalent timbers, forest management is rarely sustainable.



Extensive social science from all over the world, including Australia has clearly and repeatedly shown that a transition to nature-based economies provide more jobs, better jobs, and longer lasting jobs than exploitation-based industries such as timber harvesting (e.g. [8]).

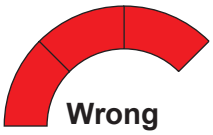
It is also wrong to suggest that more timber will be required from overseas. The vast bulk of timber can be provided from plantation forests. **More than 80% of Victoria's timber is already sourced from plantations.** In addition, the primary product generated from cutting ash forests is paper – which can readily be manufactured from plantation feedstock. In fact, plantation feedstock is the preferred source of fibre for making paper. **Notably, in 2013, 77.4% of all workers in Victoria's forest industry were employed in the plantation sector, not in native forest harvesting.**

It is wrong to imply that native forest logging is a strong economic and social component of the Victorian economy. Environmental accounting work has shown that the value-added value of logging of ash forests is just $40 per ha per year. The value-added value includes employment and employment activity. The value-added value of water production from the catchments in the Central Highlands of Victoria is $850 per ha per year (but logging can significantly reduce water yields[9,10]). The equivalent value-added estimate for tourism in the region is $1500 per ha per year (or almost double that for water) and approximately 37 times the value for logging. **Economic activity and job creation generated from tourism is significantly greater than from timber harvesting.**

- *It would add little or nothing to regional tourism which is already vibrant (based on the existing State Forests and the already extensive NationaI and State Parks) and has successfully co-existed with the timber industry for decades. Tourism is heavily reliant on the forest road network but past experience indicates that this would unlikely to be maintained if the timber industry was forced out.*

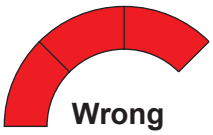
There is enormous untapped tourism potential in the Central Highlands region of Victoria – to visit the world's tallest flowering trees, spectacular waterfalls, epic vistas and much more. The Great Forest National park aims to encourage public-private partnerships to develop the infrastructure to support tourism and foster the growth and employment of this beautiful part of regional Victoria.

- Within the proposed park, unlike in State forests, there would be restrictions on camping, walking dogs, riding horses, off-road bikes, prospecting, collecting firewood, etc.



With the development of walkways, trails, campgrounds and other infrastructure, more people can visit and experience these beautiful forests. Appropriate zones and infrastructure can easily provide access to a wide range of activities – as is the experience in huge numbers of parks throughout Australia.

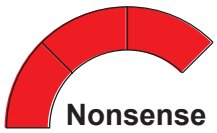
- *It would compromise our fire-fighting ability in that it would remove the forestry and timber industry personnel and their equipment which are the forest's front-line firefighters, and would result in much of the forest road network falling into disrepair. This would make Leadbeater 's Possum and the region's other conservation values even more vulnerable to their major threat, which is severe and widespread bushfire, not to mention settlements which would be enclosed by or adjacent to the proposed huge national park.*



Removing logging from extensive areas of wet ash forests will have significant positive benefits for reducing fire risk. This is because (as demonstrated by compelling scientific evidence[11]) **logging increases the risk of crown-scorching wildfires in the period between 7 and 40+ years after logged forest has been regenerated.** That is, logging adds significantly to the fire burden in ash forests and this effect lasts for decades after forests have been regenerated following harvesting. Australian wet ash forests are not alone in this regard, similar logging and fire relationships have been seen all around the world.[12] There is no reason to believe that Victorian ash forests will be any different to wet forests elsewhere around the world.

Q: Without a new national park, can anything be done to conserve Leadbeater's Possum? YES

- The most effective ways to conserve Leadbeater's Possum do not require a new national park. They include installation of nest boxes, artificial hollow creation, and captive breeding to provide animals for potential relocation to suitable habitat where they are currently absent. In addition, all known colonies of the possum in State forests are protected by generous timber harvesting exclusion zones.



This is an absurd set of suggestions and solutions from the IFA and does not have any substance in fact.

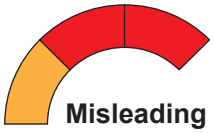
First, there is **no evidence** whatsoever to suggest that nest boxes will be effective for Leadbeater's Possum in these forests. A ten-year study showed very low levels of use of nest boxes by Leadbeater's Possum.[13] Moreover, those nest boxes were quickly rendered ineffective because they were struck by falling branches or occupied by pest animals. On this basis, nest boxes may need to be replaced up to 10 times over a 50-80 year period before new cohorts of hollow-bearing trees develop from the existing 77 year old regrowth forest.[14] In addition, **economic analyses have indicated that retaining large old trees is far more cost-effective than nest box programs.[15]**

Second, there is no evidence that creating artificial hollows will be effective for Leadbeater's Possum – the technique has not been appropriately trialled in a scientific way.

Third, **Leadbeater's Possum has not bred successfully in captivity for more than a decade.** Translocation is a high risk strategy that often fails[16] and is ethically inappropriate when there is no habitat in which to release animals.

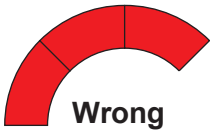
Fourth, detailed analyses of forest management indicate that current codes of practice for logging in State Forests are inadequate for the survival of Leadbeater's Possum – the reason why a large ecological reserve is required.[4] Timber exclusion zones are far from "generous" and indeed have been shown to be inadequate for the maintenance of a viable population of Leadbeater's Possum.

- *Nest boxes have been used for some time to counteract an expected shortage of tree hollows. Recent surveys have found that 25% of newly installed boxes were occupied. A program using arborists to artificially create nesting hollows in young trees has also been successful in attracting nesting possums.*



As outlined previously, **there is no evidence to suggest that nest boxes will be ecologically effective and cost-effective for Leadbeater's Possum.** A ten-year study showed very low levels of use of nest boxes by Leadbeater's possum.[13] Moreover, those nest boxes were quickly rendered ineffective because they were struck by falling branches or occupied by pest animals.[13] On this basis, nest boxes may need to be replaced up to 10 times over a 50-80 year period before new cohorts of hollow-bearing trees develop from the existing 77 year old regrowth forest.[14] In addition, economic analyses have indicated that retaining large old trees is far more cost-effective than nest box programs.[15] It makes no logical sense to establish nest boxes when large old trees continue to be lost as a direct result of logging operations and their rate of loss is elevated as a result of high-intensity fires used to regenerate logged forests.

- A substantial area of ideal future Leadbeater's Possum habitat is developing as burnt forests continue to recover from the 2009 'Black Saturday' bushfires in parts of Melbourne's water supply catchments.



Extensive and repeated field surveys have shown that Leadbeater's Possum is largely absent from sites burned in the 2009 fires.[17] It is unclear when animals may recolonize burned and naturally regenerated old growth stands. A major issue is that there is now almost no existing old growth forest – less than 1.16% of the ash forest is now old growth as a consequence of past widespread logging, clearfelling over the past 40 years, recurrent wildfires and post-fire salvage logging.[1] There is a clear need to significantly expand the size of the old growth estate. To achieve this, large areas of existing 77 year old regrowth forest that regenerated after the 1939 wildfires need to be set aside to what it was historically.[1] Expansion of the old growth estate is also essential to tackle problems with recurrent high-severity wildfire, maximize the amount of water produced from ash forests, and to maximize the amount of carbon that is stored.

- A comprehensive set of actions recommended by the Leadbeater's Possum Advisory Group in January 2014 gives confidence that this species can be successfully conserved and managed while maintaining the socio-economic value of a substantial and sustainable local timber industry. Their report can be accessed at: http://www.depi.vic.gov.au/__data/assets/pdf_file/0004/258214/Leadbeaters-Possum-Advisory-Group-Recommendations-Report_UV.pdf

It is well known and now widely accepted by conservation scientists that the LPAG process was flawed and the actions recommended were far from comprehensive.[1] The LPAG process was precluded from assessing the effectiveness of an expanded reserve system for Leadbeater's Possum. Victorian Government research conducted at the same time as the LPAG process actually showed that a large ecological research is essential to secure viable populations of Leadbeater's Possum. This has been confirmed by the most recent analysesled by scientists at

the University of Melbourne. The key underlying principle of credible ecological science is that protecting a threatened species demands tackling the processes threatening that species. Logging is a key process threatening Leadbeater's Possum.

For more information about this response to the IFA pamphlet, please contact the **Fenner School of Environment and Society** at The Australian National University: fses-cle-admin@anu.edu.au or call (02) 61257800.

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