

# Kalatha Road – Toolangi State Forest

298-515-0001

## INVESTIGATION REPORT

### Investigation into Leadbeater's Possum (*Gymnobelideus leadbeateri*) Habitat Management Prescriptions within VicForests scheduled logging coupe 298-515-0001

#### Abstract

VicForests scheduled logging coupe 298-515-0001 was investigated to assess the presence/absence of Leadbeater's Possum “Zone 1” and “Zone 1A habitat” to inform planning and operational compliance with the relevant instruments of the regulatory framework designed to provide minimum protection for the potential habitat of the endangered Leadbeater's Possum (LBP).

The instruments assessed for compliance were the:

- “*Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014*” (“Management Standards and Procedures”)
- “*Planning Standards for timber harvesting operations in Victoria's State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014*” (“Planning Standards”)

Additionally, the results of this investigation were analysed using;

- The recommendations of the latest scientific approach to *potential* Leadbeater's Possum habitat management prescriptions contained within the Fenner School of Environment and Society, Australian National University's “*New Restoration Forest Management Prescriptions to Conserve Leadbeater's Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria*” (ANU Restoration Forest Management Prescriptions)

An area of Leadbeater's Possum “Zone 1A habitat” (LBP Z1A under the Management standards and Procedures and Planning Standards) and “Zone 1” habitat (ANU Restoration Forest Management Prescriptions) was identified within VicForests scheduled logging coupe 298-515-0001 during this investigation. The criteria for assessment used, methodology employed and the results of the investigation are detailed below.

#### Surveyor/Author

Andrew Lincoln

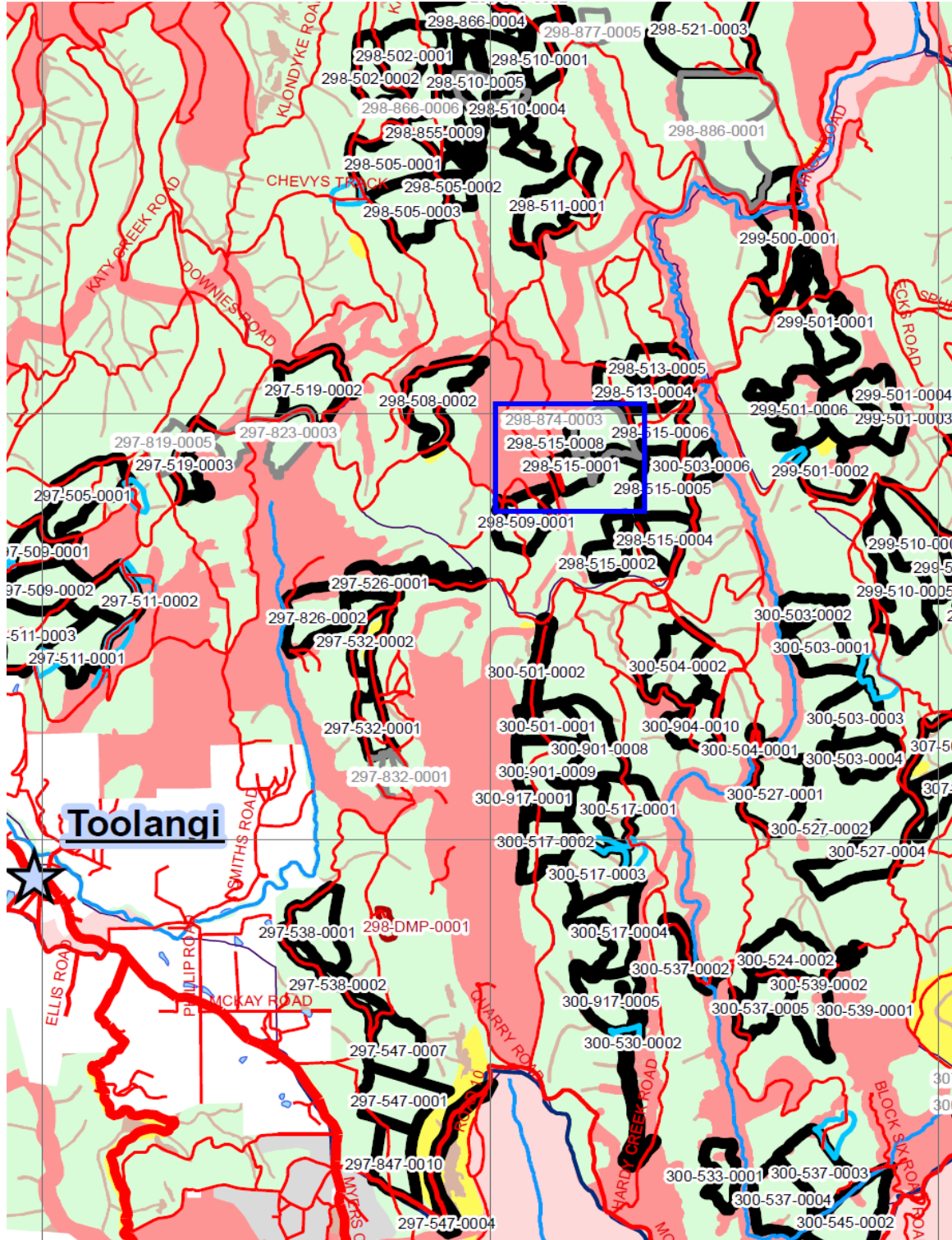
Fauna and Flora Research Collective Inc.

**Date of Investigation** 11/10/14; 12/10/14;      **Date of report** 10/07/2015

## Location details

Within and adjacent to VicForests scheduled logging coupe 298-515-0001 off Kalatha Road in the Toolangi State Forest.

Figure A. Detail from: "Approved Timber Release Plan – 2013-2016 Change Map (with all approved amendments applied) Toolangi, VicForests, 16 July 2014



\* Investigation location within blue box.

## Method 1a (method used for identifying Hollow Bearing Trees for “Zone 1A”)<sup>1</sup>

Hollow bearing trees ("HBT's") are the basis for the management prescriptions designed to provide some protection for the potential habitat required by the Leadbeater's Possum.

This investigation considers *Eucalyptus sp.* HBT's, living or dead, that contain hollows.

Each *Eucalyptus sp.* tree encountered and considered to meet the requirements of either of the definitions contained within the following “Method 2a” and/or “Method 2b” sections of this report, was first inspected for the presence of hollows using binoculars; estimated to be greater than 6.00m in height; and measured at 1.30m above ground level around the trunk of the tree using a tape measure in order to measure the circumference and corresponding DBH measurement for each tree.

Every tree was given a unique ID corresponding to the study site; assigned a "Waypoint" using a "Garmin GPSMAP 62s" GPS at an accuracy minimum of <10m<sup>+/-</sup> in the position format GDA, UTM; assessed as to the "form" of the tree corresponding to the methodology for "classification of forms of hollow-bearing trees" of Lindenmayer et. al. 1991<sup>2</sup>; analysed as to the form of the hollows present on the tree; assessed against the “tree growth stages” schema of Jacobs (1955)<sup>3</sup>; marked with "flagging tape" containing its unique ID; and finally, where possible, photographed at its base and upper branches. All of these details were noted and recorded on site.

Investigations at the site begun at various locations within and adjacent to the area of forest scheduled as VicForests “clear felling” coupe 298-515-0001 off Kalatha Road in the Toolangi State Forest. The forest was searched for HBT's following the methodology described above. As each HBT was inspected and recorded the forest was searched for further HBT's and advanced towards with the above process repeated for each. By noting the topographic and other site characteristics, compass bearing and GPS "waypoint" proximity data, the area delineated in the "Study Location" section of this report was investigated in this manner until all potential HBT's meeting the relevant criteria encountered were investigated and recorded.

Once the above process was completed the HBT location data recorded on site was later imputed into various GPS and GIS mapping software including Garmin and QGIS programs. Each HBT record was assessed against the varying criteria generative of management prescriptions under either the “Management Standards and Procedures” and “Planning Standards”, and analysed using the recommended prescriptions contained within the Fenner School of Environment and Society, Australian National University's “*New Restoration Forest Management Prescriptions to Conserve Leadbeater's Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria*”.

Data from each HBT were imputed into separate spreadsheets depending on their relevance for meeting each of the management prescriptions, and the tables and corresponding maps presented in the results section of this report were generated.

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1 “Zone 1B” investigations were not considered for this report.

2 Lindenmayer, D. B., et. al., "Characteristics of hollow-bearing trees occupied by arboreal marsupials in the montane ash forests of the Central Highlands of Victoria, south-east Australia", *Forest Ecology and Management*, Elsevier Science Publishers, Amsterdam, 1991, v40, p. 292

3 Jacobs M. R., *Growth Habits of the Eucalypts*, Forestry and Timber Bureau, 1955.

## Method 2a (method used as criteria for inclusion and/or analysis)

"First criterion for inclusion/analysis" used in this report:

From: "Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014"<sup>4</sup>, and;

From: "Planning Standards for timber harvesting operations in Victoria's State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014"<sup>5</sup>

### 4. Biodiversity

#### 4.3 Fauna - detection based zoning

##### 4.3.1 Statewide

4.3.1.1 Apply the management actions outlined in Table 4 (Detection based FMZ rules for fauna) below for zoned rare or threatened fauna.

4.3.1.2 Implement FMZ amendments and reviews in accordance with Table 4 (Detection based FMZ rules for fauna) below for new verified rare or threatened fauna records and FMZ amendment requirements outlined in section 2."

Table 4 Detection based FMZ rules for fauna<sup>6</sup>

FMA	Common name	Scientific name	Zoning management actions	Management actions	Review
Central Highland FMAs	Leadbeater's Possum	<i>Gymnobelideus leadbeateri</i>	Establish a SPZ over areas of Zone 1A habitat where there are more than 10 hollow bearing trees per 3 ha in patches greater than 3 ha.	Ensure Zone 1A habitat is not salvage logged.	Review retained habitat as ash forest areas change in relation to Zone 1A habitat criteria.

### "Glossary [compiled extract]"

'Ash' means Mountain Ash (*Eucalyptus regnans*), Alpine Ash (*Eucalyptus delegatensis*) (sic) and Shining Gum (*Eucalyptus nitens*).

'canopy' as per Code definition.

'Code' means the *Code of Practice for Timber Production 2014*.

'crown' as opposed to Crown (the governing power of the state) and in the context of a tree means the main **canopy** of a tree, including the main branches and leaves. In the context of roading crown means the slope of a road surface to the outside for drainage.

'dead' tree in the context of Leadbeater's Possum habitat means a tree that is obviously (physiologically) dead. It must be self-supporting (rooted into the ground) and would remain standing should any supporting material be removed. Dead trees must be **mature** and more than 6 m in height and greater than 1.5 m in diameter at breast height. Dead trees must be one of the **Ash** species and where species cannot be determined all dead eucalypts in areas known to

4 The State of Victoria Department of Environment and Primary Industries (now Department of Environment, Land, Water and Planning) "Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014" [Planning Standards], 2014, pp. 9-19

5 The State of Victoria Department of Environment and Primary Industries (now Department of Environment, Land, Water and Planning) "Planning Standards for timber harvesting operations in Victoria's State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014" [Management Standards and Procedures], 2014, pp. 16, 36, 39

6 Planning Standards, "Table 4 Detection based FMZ rules for fauna", p. 39

be in an Ash area are assumed to be Ash.

**'diameter'** is the width measurement of a tree or log. On a standing tree it is measured at 1.3 m above the upper ground level.

**'growth stage'** is a system used to describe the life cycle of trees based mainly on **crown** form – the main ones being **regeneration, regrowth, mature** and **senescent**.

**'hollow'** as per Code definition. However in the context of Leadbeater's Possum habitat hollows are cavities formed in the trunk or branches of a live or dead tree. They are formed in Ash eucalypt trees through a variety of processes but are generally related to ageing and decay, although physical injury and insect damage may also contribute. They vary in size, both in cavity opening diameter and cavity depth and volume, from small openings of 4 – 8 cm to very large with entrance diameters of 18 – 30 cm or more. Hollows must have an entrance diameter in excess of 4 cm and not have a height in excess of 30 m.

**'hollow bearing tree'** in the context of Zone 1A habitat means living **mature** or **senescent** trees of **Ash** eucalypt species containing hollows. Hollow bearing tree in the context of Zone 1B habitat means **dead** mature or senescent living trees of Ash eucalypt species containing hollows.

**'mature'** is a growth stage of trees. Mature **Ash** species have the following characteristics, in order of assessment priority. Note that no single characteristic defines maturity on its own, although the first characteristic (apical dominance) holds the most significant assessment weight:

1. Lack of clear apical dominance within the upper **crown**
2. Presence of permanent shaping branches with **diameters** at least one third of the bole diameter at their junction with the bole (clear of collar)
3. Shaping branches are not related either to the presence of long term natural gap in the **canopy**, or to an open grown tree position. In the case of a natural gap, such branches often occur only on one side of the tree, and the 'assessment weight' given to this characteristic may need to be downgraded (i.e. the need for other indicators increases as part of the overall assessment)
4. The shaping branches contribute significantly to lateral **crown** shape and may be competing with other shaping branches for tree height position, creating a rounded **crown** appearance (related to (1) above)
5. Apical dominance will also cease at the shaping branch level (having reached maximum length), and can induce secondary (epicormic) branch development along shaping branches
6. Some branch death (dieback) and breakage is typical, but not a dominant feature. This loss of leaf area (photosynthetic capacity) can also induce secondary (epicormic) growth to replace lost photosynthetic capacity, and
7. **Diameters** of early mature trees may occur between 90 to 200 cm DBHOB, with typical heights of 50 to 100 m. Diameters of full mature trees may be expected between 150 to 300 cm, with typical heights of 60 to 100 m. This overlap of ranges between trees in different stages indicates why diameter and height are not good indicators of **growth stage**.

**'native forest'** as per **Code** definition.

**'regeneration'** means the renewal or re-establishment of **native forest** flora by natural or artificial means following disturbance such as a timber harvesting operation or fire. Regeneration is also a **growth stage** of trees. Eucalypt seedlings that haven't reached reproductive maturity (typically less than 10 years old) are classified as regeneration.

**'regrowth'** is a growth stage of trees. Regrowth eucalypts have narrow, conical **crowns** (pointed) with relatively high individual crown densities. The majority of branches lie at an acute angle to the main stem and overall height is still increasing.

**'senescent'** is a growth stage of trees. Senescent eucalypts are characterised by dead branches and declining crown leaf area, with the trunk of the tree likely to contain burls and bumps. The top of the tree is invariably broken off with the remaining crown more than 95 % secondary, being composed of branches of epicormic origin.”<sup>7</sup>

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7 *Management Standards and Procedures*, pp. 9-19

## Method 2b (method used as criteria for inclusion and/or analysis)

"Second criterion for inclusion/analysis" used in this report:

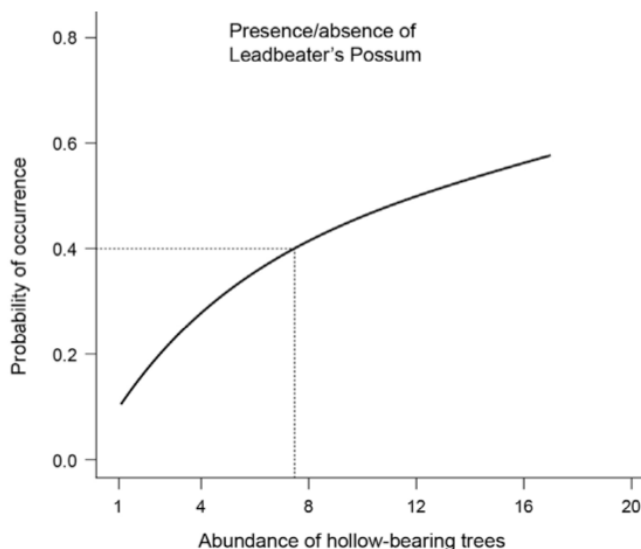
From: "New Restoration Forest Management Prescriptions to Conserve Leadbeater's Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria"<sup>8</sup>

### 1. A new zoning system for Leadbeater's Possum

#### Background scientific information:

The habitat requirements of Leadbeater's Possum have been the topic of a series of detailed studies over the past 25 years (Lindenmayer et al. 1991b, 1994, 2011b). That work has shown repeatedly that the probability of occurrence of the species at a site is significantly correlated with the abundance of hollow-bearing trees on a site (Lindenmayer et al. 1991b, 1994, 2011b, 2013a). That is, the more hollow-bearing trees that occur on a site, the higher the probability that Leadbeater's Possum will occur on that site. Current prescriptions for Zone 1 habitat for Leadbeater's Possum divide the zoning into habitat containing live trees (Zone 1A) or live and dead trees (Zone 1B). However, the original prescriptions were based on research from 1990-1991 at a time when both Leadbeater's Possum and hollow bearing trees were considerably more numerous than today. Long-term research has consistently shown the importance of both living and dead trees as nest sites for Leadbeater's Possum. Indeed, the vast majority of trees occupied by Leadbeater's Possum are dead hollow-bearing trees (Lindenmayer et al. 1991c), which have poor levels of protection under current prescriptions. Nevertheless, living hollow-bearing trees are also important because they will remain standing much longer than highly decayed trees (Lindenmayer et al. 2012a) (including persisting after future fire) and will be the next cohort of dead hollow-bearing trees in the future. For this reason, the current zoning system for Leadbeater's Possum must be revised to include living and dead trees and a reduced detection rate from the original 50% probability of detection on a site (as per the original 1A prescriptions) to a more conservative figure of 40%, in accordance with the increasing rarity of the possum. As shown in Figure 1, this means 8 hollow-bearing trees (living trees and/or dead trees) per 3 ha and irrespective of the density of wattle (*Acacia* spp.) trees in a stand.

Figure 1: Relationships between the abundance of (living and dead) hollow-bearing trees per 3 ha and the probability of occurrence of Leadbeater's Possum



<sup>8</sup> David B. Lindenmayer, David Blair, Lachlan McBurney and Sam Banks, *New Restoration Forest Management Prescriptions to Conserve Leadbeater's Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria*, Version 2: July 2013, Fenner School of Environment and Society, Australian National University, Canberra, ACT, Australia, Version 2, July 2013, p. 2-4

Based on the results of ongoing and recently updated work on the habitat requirements of Leadbeater's Possum, we argue there is a need to redefine Zone 1 habitat for the species. This redefinition demands that both living and dead trees are considered in the definition of Zone 1 forest.

To better protect identified habitat areas a 100 m wide buffer should be established adjacent to the boundary of a given area of Zone 1 habitat to: (1) protect hollow-bearing trees from fires lit to regenerate nearby logged areas, (2) protect hollow-bearing trees from wind damage, and (3) protect colonies of Leadbeater's Possum because the species is sensitive to disturbance of the surrounding landscape (Lindenmayer et al. 1993a, 2013a). Areas of Zone 1 habitat should be recognised as Special Protection Zones and this status means that it is possible to plan for the location of loggable areas. To avoid areas of Zone 1 forest being mistakenly logged, careful aerial and on-ground assessments of all areas proposed for logging in the montane ash forests of the Central Highlands of Victoria must be completed prior to harvesting taking place. The location of areas of Zone 1 forest and the adjacent buffers must be mapped and the subsequent spatial data lodged on the Government Geographic Information System to ensure they are clearly delineated as logging exclusions.

### **Prescription 1:**

**1.1.1 Zone 1 habitat for Leadbeater's Possum is any area of forest of 3 hectares or more that supports eight or more living or dead hollow-bearing trees per 3 hectares.**

**1.1.2 Zone 1 habitat will be protected by a 100 m wide buffer of unlogged forest.**

**1.1.3 Logging is not permitted in Zone 1 habitat or in associated buffers.**

**1.2 Careful aerial and on-ground assessments of all areas proposed for logging must be completed prior to commencement of harvesting.**

**1.3 The location of areas of Zone 1 forest and the adjacent buffers will be mapped and the subsequent spatial data lodged on the Government Geographic Information System."**

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### **Glossary**

**Hollow:** Any cavity at any height in a tree including holes, fissures and hollow branches (as determined by observation using binoculars; see Lindenmayer et al., 1993b) and which can be occupied by any species of arboreal marsupial.

**Hollow-bearing tree:** A hollow-bearing tree is defined as any tree of any height, whether it is living or dead, greater than 80 cm in diameter at breast height and containing one or more hollows (sensu Lindenmayer et al. 1997; see Lindenmayer et al. 1993b)."<sup>9</sup>

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<sup>9</sup> David B. Lindenmayer, David Blair, Lachlan McBurney and Sam Banks, *New Restoration Forest Management Prescriptions to Conserve Leadbeater's Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria*, Version 2: July 2013, Fenner School of Environment and Society, Australian National University, Canberra, ACT, Australia, Version 2, July 2013, p. 2-4

## Results 1a (Hollow-bearing Tree data)

The following 21 HBT's were recorded within the study location. Details of these HBT's are presented in the following table. The "Table Key" below explains each of the codes used within the table to present details collected on each HBT.

#SEE ATTACHED APPENDIX A FOR HBT PHOTOGRAPHS

Table 1a(i). 21 Hollow Bearing Trees recorded during survey. All co-ordinates in GDA/UTM.

HBT Tree ID/ Way-point	Location/GPS Co-ordinates	GPS +/-	Species	Form (Lindenmayer 1991)	Circumference at 1.3m (m)	DBH (m)	Hollows Type/ Description	Further Information Recorded:	Ashton (1975) Age Class Determination	Ashton (1976) AGE SUM $\log(y) = 1.02 \log(x)$ (years)	Jacobs (1955)
KR001	55 H 370884 5849113	7	<i>E.regnans</i>	2	8.36	2.66	1; 2(d)	3(b,c,d)	2	239	J(6)
KR002	55 H 370985 5849194	8	<i>E.regnans</i>	1	5.25	1.67	2(d)		2	151	≥J(3)
KR003	55 H 370935 5849483	7	<i>E.regnans</i>	2	8.15	2.59	2(d)	3(b,c,d)	2	233	J(6)
KR004	55 H 370918 5849499	7	<i>E.regnans</i>	2	5.80	1.85	2(b)	3(b,c,d)	2	167	≥J(5)
KR005	55 H 370898 5849488	7	<i>E.regnans</i>	2	7.40	2.36	2(b,d)	3(b,c,d)	2	212	J(6)
KR006	55 H 370716 5849383	7	<i>E.regnans</i>	1	6.01	1.91	2(d)		2	173	≥J(3)
KR007	55 H 370686 5849405	8	<i>E.regnans</i>	2	5.97	1.90	2(b); 3	3(b,c,d)	2	171	≥J(5)
KR008	55 H 370747 5849440	7	<i>E.regnans</i>	2	8.28	2.64	2(b); 3	3(c,d)	2	236	≥J(5)
KR009	55 H 370890 5849603	8	<i>E.regnans</i>	2	7.77	2.47	2(b,d); 3	3(b,c,d)	2	222	≥J(5)
KR010	55 H 370889 5849643	7	<i>E.regnans</i>	2	7.51	2.39	2(d); 3	3(b,c,d)	2	215	J(6)
KR011	55 H 370914 5849655	8	<i>E.regnans</i>	2	5.50	1.75	2(d); 4	3(b,c,d)	2	158	≥J(5)
KR012	55 H 370875 5849664	8	<i>E.regnans</i>	2	8.25	2.63	2(d)	3(c,d)	2	235	≥J(5)
KR013	55 H 370869 5849685	7	<i>E.regnans</i>	2	6.35	2.02	2(b,c,d)	3(c,d)	2	182	J(6)
KR014	55 H 370797 5849734	5	<i>E.regnans</i>	2	8.19	2.61	2(d); 3	3(d)	2	234	J(6)
KR015	55 H 370784 5849686	7	<i>E.regnans</i>	2	8.84	2.81	2(b,d)	3(c,d)	2	252	≥J(5)
KR016	55 H 370754 5849690	6	<i>E.regnans</i>	2	8.85	2.82	2(b,d)	3(c,d)	2	252	J(6)
KR017	55 H 370699 5849538	7	<i>E.regnans</i>	2	6.84	2.18	2(d)	3(c,d)	2	196	≥J(5)
KR018	55 H 370690 5849737	9	<i>E.regnans</i>	2	11.60	3.69	1; 2(b-d)	3(b-d)	2	329	≥J(5)
KR019	55 H 370662 5849713	9	<i>E.regnans</i>	2	9.70	3.09	2(c,d)	3(b,c,d)	2	276	≥J(5)
KR020	55 H 370697 5849683	9	<i>E.regnans</i>	2	6.40	2.04	2(d); 3	3(b,c,d)	2	184	≥J(5)
KR021	55 H 370708 5849667	9	<i>E.regnans</i>	2	7.45	2.37	3	3(c)	2	213	≥J(5)

Table 1a(ii). Table Key describing Table 1a(i).

### TABLE KEY

Lindenmayer (1991):	Hollow Type/Description:	Further Information Recorded:	Ashton (1975) Age Class Determination:	Jacobs (1955):
<b>1</b> Mature, living tree with hollow s	<b>1</b> Large obvious hollow s	<b>3(a)</b> Multiple leading stems	<b>1</b> < 1.50 DBH - "Not Mature" (approx. 40-80 years)	<b>J(1)</b> Regeneration
<b>2</b> Mature, living tree with hollow s and dead/broken top	<b>2(a)</b> Fissures	<b>3(b)</b> Low Branching	<b>2</b> ≥ 1.50 DBH - "Mature" (approx. 100-300 years)	<b>J(2)</b> Regrowth
	<b>2(b)</b> Dead/Broken Top	<b>3(c)</b> Irregular Crown		<b>J(3)</b> Mature (younger)
	<b>2(c)</b> Hollow spouts	<b>3(d)</b> Major Scars		<b>J(4)</b> Mature (older)
	<b>2(d)</b> Basal fire scars/hollow s			<b>J(5)</b> Senescing (1)
	<b>3</b> Hollow s on trunk(direction)			<b>J(6)</b> Senescing (2)



## Results 1b – Figures 1-2. [following 2 pages]

Figure 1.

- All 21 (living) Hollow Bearing Trees recorded during survey, as listed in Table 1a. are displayed in Figure 1.
- Each living HBT is represented by a “green circle” symbol and is positioned and labeled according to its unique HBT ID and GPS location as displayed in the preceding Tables 1a.
- 18 Stags (dead Eucalypt trees) are displayed as “brown diamonds”.
- (NB: the “Stags (dead HBT's)” are not included in the polygon generation/density calculations for Method 2a)
- The “red polygon” (centre) shows the scheduled coupe extent of coupe 298-515-0001 (18.37ha).
- The total area contained within the “blue polygon” is 4.61ha representing a HBT density of 4.12 per hectare for the 19 trees (HBT's 3-21) included in the polygon generation. This is the **Method 2a: Zone 1A - Management Procedures and Regulations/Planning Standards** area.
- The total area contained within the “solid lined green polygon” is 14.61ha representing a HBT density of 2.67 per hectare for the 39 trees included in the polygon generation. This is the **Method 2b: Zone 1 – ANU Restoration Forest Management Prescriptions (Prescription 1., 1.1.1.)** area.
- The “dashed green line” is offset at 100m from the “solid green line” (ANU Zone 1, 1.1.1.) area and constitutes the 100m buffer on the Zone 1 area (**Method 2b: Zone 1 – ANU Restoration Forest Management Prescriptions (Prescription 1., 1.1.2.)**).
- The “dash, dot, dotted green circles” and the “dotted brown line” are 100m buffers on the Hollow-bearing Trees positioned within them and constitute the buffers required by **ANU Restoration Forest Management Prescriptions (Prescription 3., 3.1.)**: “Each hollow-bearing tree (whether living or dead) will be surrounded by a buffer of unlogged forest measuring 100 m in radius.”<sup>10</sup>

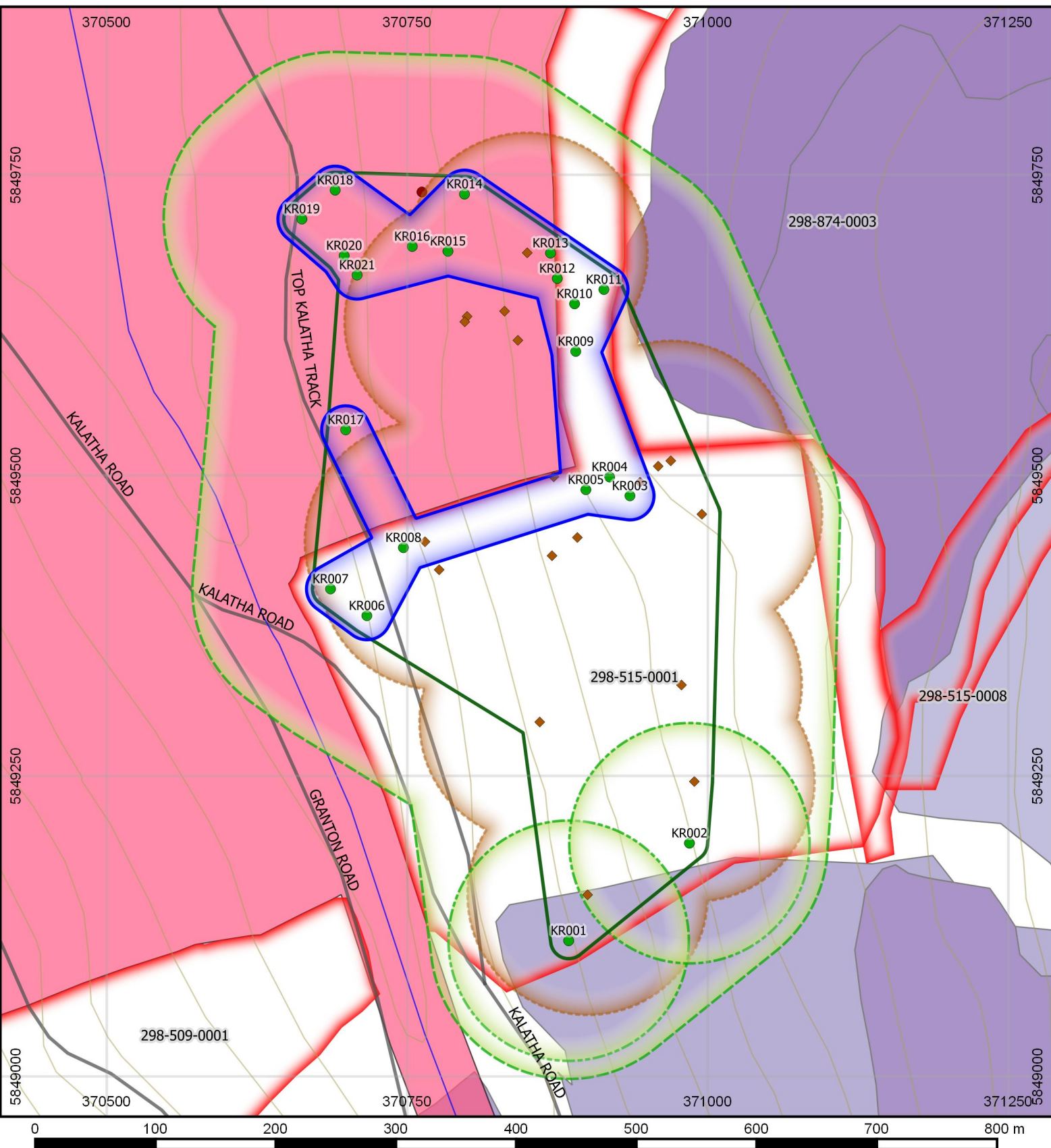
Figure 2.

- Figure 2. shows the same information as described above overlaid on satellite imagery.

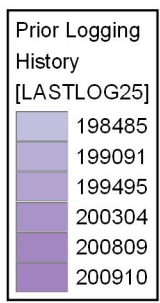
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10 Lindenmayer, D. B., et. al., *New Restoration Forest Management Prescriptions to Conserve Leadbeater's Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria*, Version 2: July 2013, Fenner School of Environment and Society, Australian National University, Canberra, ACT, Australia, Version 2, July 2013, p. 5-7

Results 1b. Figure 1. Kalatha Road; Hollow bearing Trees; LBP Zone 1A/Zone 1 (and associated buffers); Forest Management Zoning [DEPI, June, 2014]; Prior clearfell logging history since 1970 [DEPI; December, 2013]; Roads, Watercourses, Contours



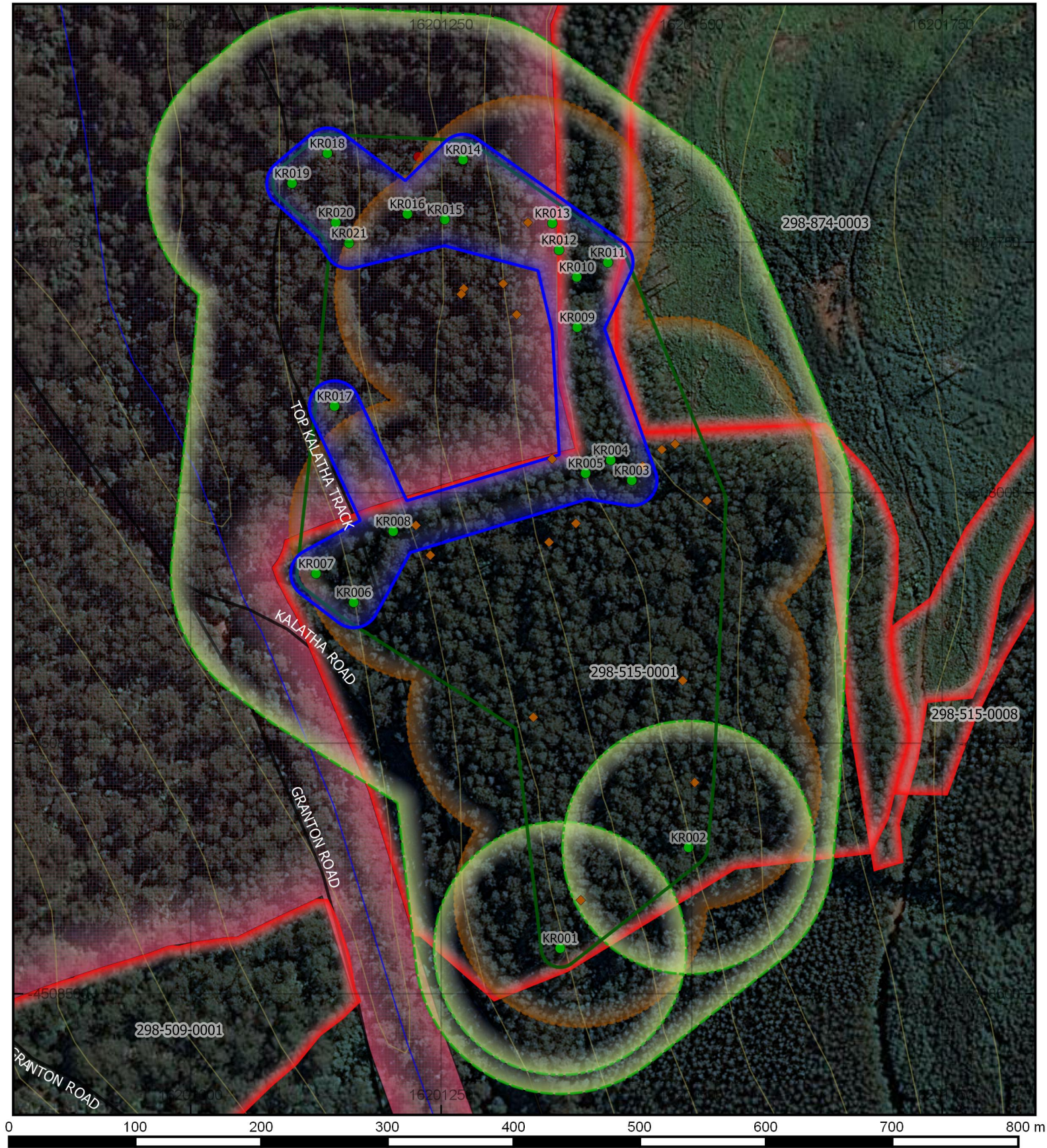
- Legend**
- Living Hollow Bearing Trees
  - ◆ Dead Hollow Bearing Trees (stags)
  - LBP Zone 1A - 4.61ha for 19 HBT's at 4.12 HBT/ha (Management Standards and Procedures/ Planning Standards)
  - LBP Zone 1 - 14.06ha for 39 living & dead HBTs at 2.77 HBT/ha (ANU)
  - 100m Buffer on LBP Zone 1 (ANU)
  - 100m Buffer on outlier living HBT's
  - 100m Buffer on all 18 dead HBT's (stags)
  - Leadbeater's Possum Record [VBA100]
  - Timber Release Plan [TRP\_2014-08-22]
  - Forest Management Zoning [FMZ100] (DEPI, June 2014)
  - Special Protection Zone
  - General Management Zone
  - Watercourses
  - Roads
  - Contours



Projection: EPSG: 28355  
GDA94/MGA Zone 55

Map Scale:  
**1:4.250**

Results 1b. Figure 2. Kalatha Road; Hollow bearing Trees; LBP Zone 1A/Zone 1 (and associated buffers); Forest Management Zoning [DEPI, June, 2014]; Roads, Watercourses, Contours; Satellite Imagery



**Legend**

- Living Hollow Bearing Trees
- ◆ Dead Hollow Bearing Trees (stags)
- LBP Zone 1A - 4.61ha for 19 HBT's at 4.12 HBT/ha (Management Standards and Procedures/ Planning Standards)
- LBP Zone 1 - 14.06ha for 39 living & dead HBT'S at 2.77 HBT/ha (ANU)
- 100m Buffer on LBP Zone 1 (ANU)
- 100m Buffer on outlier living HBT's
- 100m Buffer on all 18 dead HBT's (stags)
- Leadbeater's Possum Record [VBA100]
- TRP\_2014-08-22
- Roads
- Watercourses
- Contours
- Forest Management Zoning [FMZ100] (DEPI, June 2014)
- Special Protection Zone
- General Management Zone

Projection: EPSG: 3857  
WGS 84 / Pseudo Mercator

Map Scale:  
**1:5,000**

## Discussion 1 (considering Method 2a)

*“Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014” and “Planning Standards for timber harvesting operations in Victoria’s State forests 2014, Appendix 5 to the Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014” (“Management Standards and Procedures/Planning Standards”)*

**“ZONE 1A”** The *“First criterion for inclusion/analysis”* followed in this investigation requires the establishment of an “SPZ over areas of Zone 1A habitat where there are more than 10 hollow bearing trees per 3 ha in patches greater than 3 ha.” (“Zone 1A”).

1. Within the 4.61ha Leadbeater's Possum “Zone 1A” patch presented in Results 1b Figure 1. as the blue polygon there are 19 HBT's representing a HBT density of 4.12 exceeding the required density of >3.33 HBT's p/ha.
2. Each HBT included in this 4.12 “Zone 1A” area conforms to the definition contained within “Management Standards and Procedures/Planning Standards”'s “Glossary”.
3. Each included HBT is a “mature” or “senescent” “Ash” Eucalypt tree containing a “hollow”.  
NB: See APPENDIX B for commentary on the “deliberate strategic narrowing of [the] definition of ‘mature’ trees” now adopted in the “Management Standards and Procedures/Planning Standards”'s glossary.
4. The area within the “blue polygon” in Figures 1. generated from the data in Table 1a. must be included in the SPZ under this criterion.

## Discussion 2 (considering Method 2b)

*“New Restoration Forest Management Prescriptions to Conserve Leadbeater’s Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria”<sup>11</sup>*

**“ZONE 1”** *“Second criterion for inclusion/analysis”*:

**Prescription 1:**

**1.1.1 Zone 1 habitat for Leadbeater’s Possum is any area of forest of 3 hectares or more that supports eight or more living or dead hollow-bearing trees per 3 hectares.**

**1.1.2 Zone 1 habitat will be protected by a 100 m wide buffer of unlogged forest.**

**Glossary**

**Hollow:** Any cavity at any height in a tree including holes, fissures and hollow branches (as determined by observation using binoculars; see Lindenmayer et al., 1993b) and which can be occupied by any species of arboreal marsupial.

**Hollow-bearing tree:** A hollow-bearing tree is defined as any tree of any height, whether it is living or dead, greater than 80 cm in diameter at breast height and containing one or more hollows (sensu Lindenmayer et al. 1997; see Lindenmayer et al. 1993b).

1. 39 Hollow-bearing Trees (“HBT’s”) were observed and recorded within or adjacent to the

<sup>11</sup> David B. Lindenmayer, David Blair, Lachlan McBurney and Sam Banks, *New Restoration Forest Management Prescriptions to Conserve Leadbeater’s Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria*, Version 2: July 2013, Fenner School of Environment and Society, Australian National University, Canberra, ACT, Australia, Version 2, July 2013, p. 2-4

forest that comprises VicForests scheduled logging coupe 298-515-0001.

2. Each of these 39 HBT's were a mix of living and dead trees and each was observed as clearly > 0.8m DBH and contained one or more hollows in accordance with "Prescription 1." and its corresponding "Glossary" detailed above.
3. "Prescription 1." requires a HBT density of  $\geq 2.67$  HBT's p/ha.
4. The "solid green line" encompassing all of the HBT's shown in Results 1b Figure 1. is 14.61 hectares, and as such is clearly "3 hectares or more". This area of forest has a HBT density of 2.67 HBT's p/ha.
5. The area of forest within the "solid green line" is Zone 1 potential habitat for Leadbeater's Possum.
6. Figure 1. shows a "dashed green line" polygon offset at 100m from the perimeter of the 14.61ha LBP Zone 1 Habitat identified above.
7. Logging should be excluded from the area of forest contained within the 100m buffer "dashed green line" surrounding the "ANU Zone 1" patch displayed in Results 2. Figure 1.

## **Conclusions (considering Discussion's 1-2/Methods 2a-b)**

1. An area of Leadbeater's Possum "Zone 1A" and "Zone 1" habitat identified under the each of the prescriptions summarised below was identified within this investigation within and adjacent to scheduled coupe 298-515-0001. This area must be protected from logging and the impacts of "regeneration burning" via its inclusion in the "Special Protection Zone".

In summary, this conclusion is drawn from the following:

"Management Standards and Procedures/Planning Standards"

### **ZONE 1A**

2. At least 10 live "hollow bearing trees" per 3 ha exist within the "blue polygon" presented in Figures 1. and is an area greater than 3 hectares.
3. The forest identified within the "blue polygon" in Figure 1. generated from the data in Table 1a. must be included in the SPZ under this criterion.

*Australian National University - New Restoration Forest Management Prescriptions*

### **Recommended ZONE 1**

4. Each of the 39 living and dead Hollow-bearing Trees displayed in Figure 3. are >0.80m DBH and exist within the "green polygon" displayed in Figure1. at an HBT density  $\geq 2.67$  HBT's p/ha. This "Zone 1" patch is displayed buffered by the "dashed green polygon" offset at 100m.
5. The forest identified within the "dashed green polygon" in Figure 1. generated from the data in Table 1a. should be included in the SPZ under this criterion.

The following excerpt is commentary on the regressive process undertaken by the Department of Environment and Primary Industries (now Department of Environment, Land, Water and Planning) and VicForests to reduce the definition of what constitutes a “mature” tree, and then finally to incorporate this definition in to the relevant regulatory provisions determining Zone 1A forest.

**“Logging of suitable habitat for Leadbeater’s Possum**

It has become clear to members of the ANU team that VicForests staff are not sufficiently trained to recognise suitable habitat or habitat trees for Leadbeater’s Possum. This has resulted in areas of suitable habitat for this nationally endangered species being logged. For example, the clear tell-tale signs of the species presence (actively used “keyhole” cavities in dead stag trees) were overlooked on a number of coupes such as South Col in the Toolangi region. This lack of training also includes species other than Leadbeater’s Possum. Consistent, ongoing, formal and adequate training of staff in recognising all habitat elements in these forests is crucial to ecologically sustainable forest management.

In addition, suitable areas of habitat will be logged due to the recent weakening of survey protocols for Leadbeater’s Possum by both DEPI and VicForests, including the deliberate strategic narrowing of their definition of ‘mature’ trees. This truncates the younger end of the original ‘mature’ spectrum by as much as 60 years, leaving hollow bearing trees that are not yet beginning to senesce open to harvesting, including those from 1939 age forest. This clearly goes against the original intention and understanding of those who were responsible for the original LBP Action Statement. These changes are particularly disappointing given that VicForests’ Forest Management Plan (September 2013, v1 for public consultation) states that VicForests is “committed to the maintenance and protection of forest biodiversity” (Section 8, Biodiversity). The commitment is that VicForests will work with other forest managers to “protect sufficient habitat for all species to thrive” and use of the “precautionary approach to environmental management”. The precautionary principle in this instance would involve retaining the original definition of ‘hollow bearing tree’ (any tree with a hollow) rather than taking those who question this change in definition to court.

Given that 42% of the suitable habitat for Leadbeater’s Possum was lost in the 2009 Black Saturday fires, inappropriate assessments of the forest to determine habitat suitability for this species is poor forest management practice. This is a major problem given the very large number of proposed coupes (> 410) on the current Timber Release Plan which are unlikely to be properly assessed prior to the commencement of clearfelling, which will kill animals on site and then render the subsequent regrowth forest unsuitable habitat for Leadbeater’s Possum for at least the following 120 years.”<sup>12</sup>

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12 [Lindenmayer, David B., Blair, David, McBurney, Lachlan, “Submission: Comments on Forest Management Practices by Vic Forests”, Fenner School of Environment and Society, The Australian National University, Canberra, September 2012](#)