

Leadbeater's Possum Zone 1A Habitat Detection Report

**VicForests Logging Coupes: 289-502-0001, 289-502-0002, 288-506-0002,
288-505-0001**

Dry Creek Hill Road, Snobs Creek, Rubicon State Forest

This report details the detection of high-quality Leadbeater's Possum (*Gymnobelideus leadbeateri*) Zone 1A Habitat within VicForests logging coupes 289-502-0001, 289-502-0002, 288-506-0002 & 288-505-0001

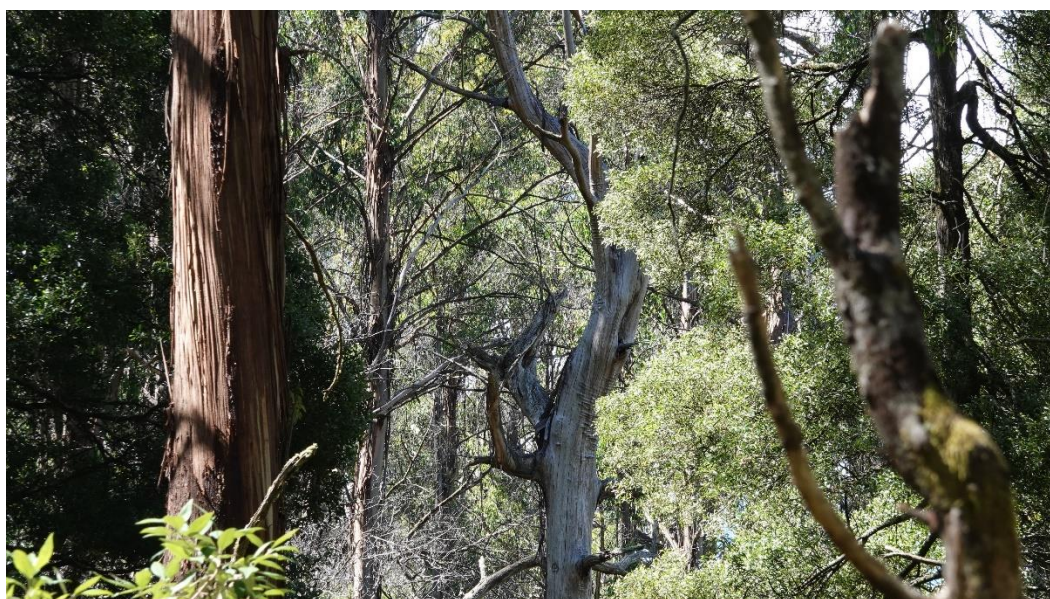


Figure a. Photograph taken within coupe 289-502-0002 'Gulmarg'.

Abstract

Field surveys were undertaken within and adjacent VicForests logging coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001 in the Rubicon State Forest across multiple survey dates, to determine if Leadbeater's Possum (*Gymnobelideus leadbeateri*) Zone 1A habitat was present. For each hollow-bearing tree encountered, a waypoint was marked by GPS, the circumference of the tree was measured at breast height, species and growth stage was noted, obvious hollows were noted including the aspect and distance from ground (m) of significant hollows where necessary. 116 Zone 1a trees were documented during this investigation. GIS mapping and spatial analysis was undertaken to determine if the density of live hollow-bearing ash trees met the Zone 1a prescription outlined in the '*Planning Standards for timber harvesting operations in Victoria's State forests 2014*'. We conclude that this investigation found the presence of Leadbeater's Possum Zone 1A habitat within and adjacent VicForests logging coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001, and therefore a Special Protection Zone must be immediately established to protect this critical Leadbeater's Possum habitat from logging operations.

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Wildlife of The Central Highlands Inc.

Dates of investigations: 18th Dec 2020, 7th July 2021, 8th July 2021, 17th Oct 2021, 24th Oct 2021

Date of report: 29 Oct 2021

Introduction

The Leadbeater's Possum (*Gymnobelideus leadbeateri*) (LBP) is a critically endangered possum found mostly within the montane ash forests of Victoria's Central Highlands and they are dependent on hollows in mature and dead trees (Lindenmayer et al. 1990). The 'Planning standards for timber harvesting in Victoria's state forests 2014 (**the Planning Standards**)' outlines the following legislative protection for Leadbeater's Possum habitat:

"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." (pp39)

The Management Standards and Procedures for timber harvesting operations in Victoria's state forests 2014 (**the MSPs**) provide the following definition for Zone 1A hollow-bearing trees (HBTs):

"'hollow bearing tree' in the context of Zone 1A habitat means living mature or senescent trees of Ash eucalypt species containing hollows" (pp12) The **MSPs** also states that "'Ash' means Mountain Ash (*Eucalyptus regnans*), Alpine Ash (*Eucalyptus delegatensis*) and Shining Gum (*Eucalyptus nitens*)." (pp9)

Investigation location

The forest subject of this investigation is of extremely high conservation value and a rare example of uneven-aged old growth ash forest in the Central Highlands. The dominant Eucalypt species are Mountain Ash (*E. regnans*) and Alpine Ash (*E. delegatensis*), however this patch of forest contains ecotones with a high diversity of other scattered Eucalypts present, namely Narrow-leaved Peppermint (*E. radiata*), Messmate (*E. obliqua*), Manna Gum (*E. viminalis*), Mountain Gum (*E. dalrympleana*) and Southern Blue Gum (*E. globulus*). Recent surveys from The Forest Protection Survey Program (FPSP) have detected Koala within these subject coupes as well as an abundance of hollow-dependent fauna including Greater Glider, Yellow-bellied Glider, Feather-tailed Glider, Eastern-Pygmy Possum, Mountain Brushtail Possum, Agile Antechinus and Sooty Owl. WOTCH has also reported on the presence of Greater Gliders and Koala within these coupes. Despite recent survey results from the FPSP and WOTCH, the area remains scheduled for logging on VicForests current TRP which includes the additions of new coupes in the immediate area.

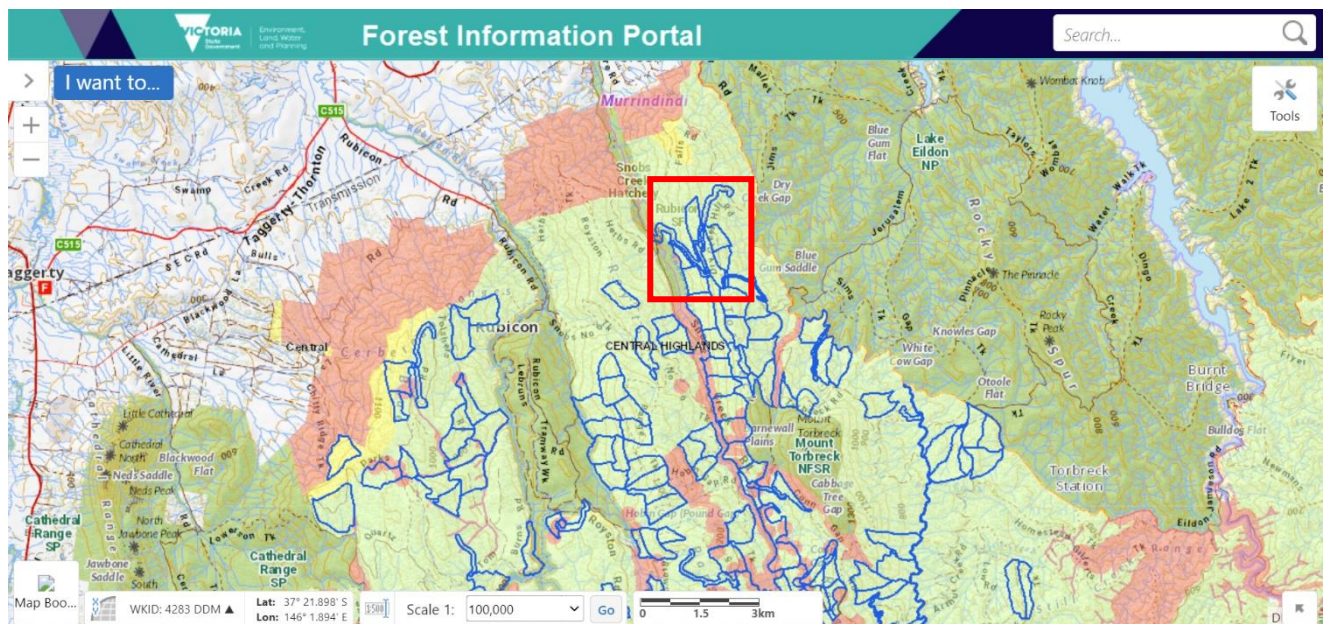


Figure i. Screenshot from the Victorian Government's Forest Information Portal (FIP) interactive map, accessed on 18 Oct 2021: [Forest Information Portal \(ffm.vic.gov.au\)](http://ffm.vic.gov.au)

Note: red box indicates investigation location

Methodology

VicForests logging coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001 were assessed to determine if LBP Zone 1A habitat was present. Field surveys were undertaken on 18 Dec 2020, 7 Jul 2021, 8 Jul 2021, 17 Oct 2021 & 24 Oct 2021. The following outline the steps that were taken during this investigation:

- Logging coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001 were viewed online via VicForests Timber Release Plan published in September 2021.
- Forest within and adjacent the logging coupes was traversed by field surveyors to identify the presence of live hollow-bearing ash trees that were within the area. This investigation did not record dead hollow-bearing ash trees, of which there were many within the area. Surveyors also didn't document non-ash hollow-bearing trees, of which there were also many present.
- Large live ash trees were inspected using binoculars and cameras with zooming capabilities to identify and confirm any suspected hollows.
- At the base of each live hollow-bearing ash tree, a unique GPS waypoint was recorded on a hand-held Garmin GPS device. The code for each tree recorded obtained the following sequence;
 - Two-three letters representing an area code which were changed across each survey date eg '**MON**' for Monda Road,
 - '**01**' for the first tree recorded on each survey date, this would then ascend as surveyors continued to record the trees throughout the area; 02, 03, and so on,
 - Two letters for the tree species, eg '**MA**' for Mountain Ash (*Eucalyptus regnans*).
- The circumference of the tree was measured at breast height (approx 1.3m off the ground) and was noted in a spreadsheet for each marked tree. The circumference of each tree was later divided by pi (3.142) to provide a figure on the diameter at breast height.
- A series of photographs were taken for each marked tree, including a photograph of the circumference measurement at breast height with GPS coordinates also in the frame, as well as a series of photos showing the base, structure, crown, and any obvious hollows for each tree.
- All of the data was scribed during the field surveys and later transcribed into an excel spreadsheet, as seen in the results section of this report. Relevant data recorded included waypoint name, tree species, growth stage, circumference at breast height, and a description of obvious hollows including aspect and distance from ground where necessary. Distance from ground was not provided for basal hollows and aspect was not provided for dead-leading spout (DLS) hollows.
- The hollows described in this investigation included only those which could be clearly identified from the ground, and it's likely that for each Zone 1a HBT, particularly those in the late-mature or senescing growth stage, that the crown contained more hollows which went unseen from the ground due to intruding foliage and branches blocking the line of sight. For HBTs with many obvious hollows, only a small handful of hollows were described.
- See figure ii. below for Geographic Information Systems (GIS) mapping and spatial analysis methodology.

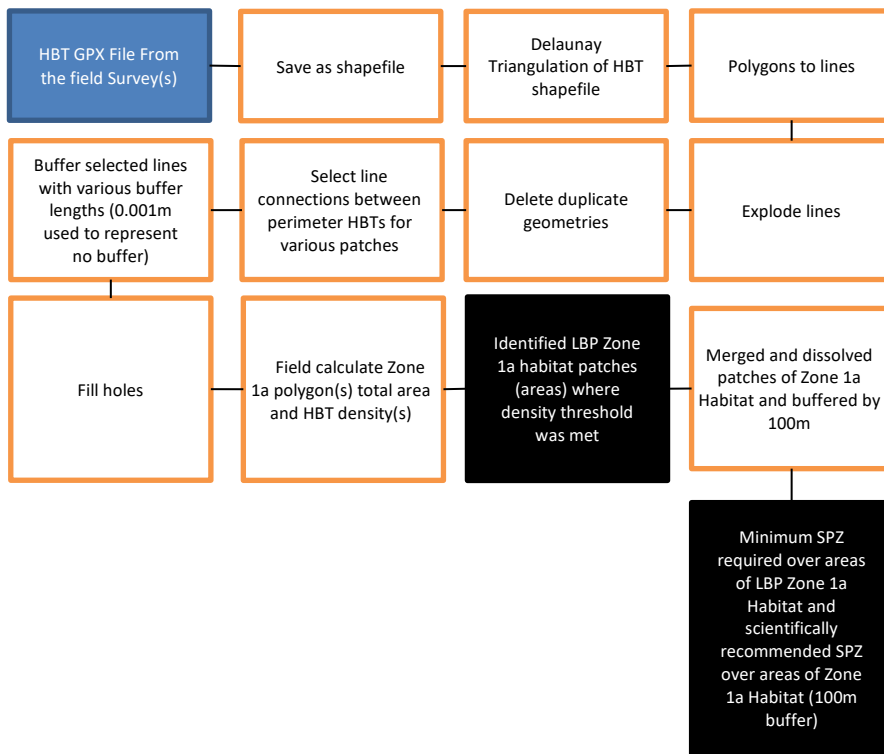


Figure ii. Flowchart describing processing of data in QGIS; whereby the blue represents input data, the black represents output data and the orange represent geoprocessing tools used to identify Leadbeater’s Possum Zone 1A habitat in QGIS.

Results

Table of survey results:

Table 1. Descriptions of obvious hollows and characteristics of hollow-bearing ash trees recorded during this investigation on 18 Dec 2020 (GU), 7 Jul 2021 (MAR) 8 Jul 2021 (DRY), 17 Oct 2021 (HIL) & 24 Oct 2021 (TOR). CBH and DBH refer to the circumference and diameter respectively, of each tree measured at breast height. 116 live hollow-bearing ash trees were recorded during this investigation, all of which were identified as either Mountain Ash (*E. regnans*) or Alpine Ash (*E. delegatensis*).

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
GU01MA	<i>Eucalyptus regnans</i>	Senescing	5.86	1.87	Present	Present (northern aspect)	Present (northern aspect)	N/A
GU02AA	<i>Eucalyptus delegatensis</i>	Senescing	4.64	1.48	Present	Multiple present on eastern aspect (one at 30m)	N/A	N/A
GU03MA	<i>Eucalyptus regnans</i>	Mature	6.24	1.99	N/A	N/A	Present (south-western aspect)	10m (north-eastern aspect)
GU05AA	<i>Eucalyptus delegatensis</i>	Mature	5.16	1.64	N/A	N/A	N/A	Present in the crown
GU06AA	<i>Eucalyptus delegatensis</i>	Senescing	5.41	1.72	Present	Multiple present on northern aspect (one at 7m)	Present (western aspect)	N/A

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
GU07MA	<i>Eucalyptus regnans</i>	Mature	6.80	2.16	Present	50m (northern aspect)	Present (north-western aspect)	N/A
GU08MA	<i>Eucalyptus regnans</i>	Senescing	6.61	2.10	Present	N/A	Present (southern aspect)	Present
GU09MA	<i>Eucalyptus regnans</i>	Senescing	8.41	2.68	N/A	20m (eastern aspect)	Present (northern aspect)	N/A
GU10AA	<i>Eucalyptus delegatensis</i>	Senescing	4.22	1.34	Present	N/A	N/A	N/A
GU11AA	<i>Eucalyptus delegatensis</i>	Mature	4.35	1.38	N/A	35m (northern aspect), birds sighted using hollow	N/A	N/A
GU12AA	<i>Eucalyptus delegatensis</i>	Senescing	5.13	1.63	Present	35m (northern aspect)	Present (northern aspect)	N/A
GU13MA	<i>Eucalyptus regnans</i>	Mature	5.34	1.70	Present	Fissure hollow 10m to 30m (southern aspect)	N/A	N/A
GU14AA	<i>Eucalyptus delegatensis</i>	Senescing	5.12	1.63	Present	N/A	Present	30m (north-eastern aspect)
GU15AA	<i>Eucalyptus delegatensis</i>	Senescing	5.84	1.86	Present	5m (eastern aspect)	N/A	N/A
GU16AA	<i>Eucalyptus delegatensis</i>	Senescing	5.40	1.72	N/A	20m (eastern aspect)	N/A	N/A
GU17AA	<i>Eucalyptus delegatensis</i>	Senescing	6.23	1.98	Present	25m (eastern aspect)	N/A	N/A
GU18AA	<i>Eucalyptus delegatensis</i>	Senescing	4.59	1.46	Present	25m (south-eastern aspect), 15m (northern aspect)	N/A	Present
GU19MA	<i>Eucalyptus regnans</i>	Mature	6.81	2.17	N/A	N/A	Present (northern aspect)	10m (eastern aspect)
GU21AA	<i>Eucalyptus delegatensis</i>	Senescing	5.59	1.78	Present	N/A	Present (eastern aspect)	N/A
GU22AA	<i>Eucalyptus delegatensis</i>	Senescing	5.57	1.77	Present (x2)	N/A	N/A	20m (southern aspect)
GU23AA	<i>Eucalyptus delegatensis</i>	Senescing	4.75	1.51	Present	N/A	N/A	N/A
MAR01MA	<i>Eucalyptus regnans</i>	Senescing	3.98	1.27	Present	20m (north-eastern aspect)	N/A	N/A
MAR02MA	<i>Eucalyptus regnans</i>	Senescing	3.69	1.17	Present	15m (north-western aspect)	Present	30m (northern aspect)

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
MAR04AA	<i>Eucalyptus delegatensis</i>	Mature	3.86	1.23	N/A	N/A	N/A	20m (northern aspect), 30m (western aspect)
MAR05AA	<i>Eucalyptus delegatensis</i>	Senescing	3.78	1.20	N/A	12m (north-western aspect)	Present (western aspect)	Multiple present
MAR05AA (i)	<i>Eucalyptus delegatensis</i>	Mature	4.22	1.34	N/A	15m (north-western aspect)	N/A	N/A
MAR06AA	<i>Eucalyptus delegatensis</i>	Senescing	5.52	1.76	Crown recently broken off, live cambium still present on the trunk	N/A	Present (north-western aspect)	20m (southern aspect)
MAR08AA	<i>Eucalyptus delegatensis</i>	Mature	3.79	1.21	N/A	15m (north-western aspect)	N/A	N/A
MAR09AA	<i>Eucalyptus delegatensis</i>	Senescing	6.35	2.02	Present (35m)	N/A	Present (western aspect)	N/A
MAR10AA	<i>Eucalyptus delegatensis</i>	Mature	3.30	1.05	N/A	25m (eastern aspect), 8m (eastern aspect)	N/A	30m (eastern aspect)
MAR11AA	<i>Eucalyptus delegatensis</i>	Senescing	5.43	1.73	Present (50m)	20m (western aspect)	N/A	Limb hollows present
MAR12AA	<i>Eucalyptus delegatensis</i>	Senescing	4.84	1.54	Present (40m)	N/A	Present	35m, 37m (northern aspect)
MAR13AA	<i>Eucalyptus delegatensis</i>	Senescing	6.10	1.94	N/A	27m (north-western aspect), 30m (western aspect)	Present (western aspect)	x3 at 30m (north-eastern aspect), spout hollow at 28m (southern aspect)
MAR14AA	<i>Eucalyptus delegatensis</i>	Late-Mature	5.74	1.83	Present (50m)	N/A	Present (eastern aspect)	50m (south-western aspect)
MAR15AA	<i>Eucalyptus delegatensis</i>	Late-Mature	4.42	1.41	N/A	15m (northern aspect)	Present (western aspect)	35m (north-western aspect)
MAR16AA	<i>Eucalyptus delegatensis</i>	Late-Mature	5.16	1.64	N/A	20m (southern aspect), x2 (north-eastern aspect)	N/A	N/A
MAR17AA	<i>Eucalyptus delegatensis</i>	Senescing	6.18	1.97	Present	20m (western aspect)	N/A	30m (north-eastern aspect)
MAR18AA	<i>Eucalyptus delegatensis</i>	Senescing	9.09	2.89	Present (50m)	x2 at 40m (north-eastern aspect)	Present (northern aspect)	Multiple present
MAR19AA	<i>Eucalyptus delegatensis</i>	Late-Mature	5.92	1.88	N/A	40m (north-eastern aspect)	Present (southern aspect)	20m (north-eastern aspect)
MAR20AA	<i>Eucalyptus delegatensis</i>	Senescing	4.95	1.58	Present	25m (northern aspect)	N/A	15m (north-western aspect)

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
MAR21AA	<i>Eucalyptus delegatensis</i>	Mature	3.19	1.02	N/A	15m (western aspect)	N/A	N/A
MAR22AA	<i>Eucalyptus delegatensis</i>	Mature	6.32	2.01	N/A	23m, 30m (southern aspect)	N/A	N/A
MAR23AA	<i>Eucalyptus delegatensis</i>	Late-Mature	4.94	1.57	Present	N/A	N/A	Present
DRY01AA	<i>Eucalyptus delegatensis</i>	Late-Mature	5.84	1.86	N/A	N/A	N/A	x3 at 10-20m (north-western aspect), x3 at 13-25m (southern aspect)
DRY02AA	<i>Eucalyptus delegatensis</i>	Mature	4.52	1.44	N/A	N/A	N/A	13m (north-eastern aspect)
DRY03AA	<i>Eucalyptus delegatensis</i>	Mature	5.06	1.61	N/A	N/A	N/A	10m (northern aspect), 12m (north-eastern aspect)
DRY04AA	<i>Eucalyptus delegatensis</i>	Mature	4.67	1.49	N/A	Present	N/A	13m (western aspect)
DRY05MA	<i>Eucalyptus regnans</i>	Late-Mature	4.29	1.37	N/A	x4 at around 20m (northern aspect)	Present (eastern aspect)	30m (eastern aspect)
DRY06AA	<i>Eucalyptus delegatensis</i>	Senescing	6.17	1.96	Present	30m (eastern aspect), 23m (northern aspect)	N/A	Present in the crown
DRY07AA	<i>Eucalyptus delegatensis</i>	Mature	4.09	1.30	N/A	28m (eastern aspect)	N/A	N/A
DRY08AA	<i>Eucalyptus delegatensis</i>	Mature	4.25	1.35	N/A	x2 at 6m (eastern aspect)	Present (eastern aspect)	N/A
DRY09AA	<i>Eucalyptus delegatensis</i>	Mature	4.88	1.55	N/A	Fissure hollow at 10-15m (southern aspect)	N/A	N/A
DRY10AA	<i>Eucalyptus delegatensis</i>	Senescing	6.05	1.93	Present (50m)	30m (northern aspect)	Present (northern aspect)	35m (western aspect)
DRY11AA	<i>Eucalyptus delegatensis</i>	Senescing	5.22	1.66	Present (45m)	N/A	Present (northern aspect)	Fissure hollow at 50m (south-eastern aspect)
DRY12AA	<i>Eucalyptus delegatensis</i>	Late-Mature	4.66	1.48	Present (35m)	Fissure hollow at 35m (northern aspect)	N/A	N/A
DRY13AA	<i>Eucalyptus delegatensis</i>	Senescing	5.95	1.89	Present (45m)	N/A	Present (northern aspect)	40m (western aspect)
DRY14MA	<i>Eucalyptus regnans</i>	Mature	5.94	1.89	N/A	N/A	Present (northern aspect)	30m (northern aspect)
DRY15MA	<i>Eucalyptus regnans</i>	Mature	3.89	1.24	Present (35m)	8m (north-western aspect)	N/A	N/A

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
DRY16MA	<i>Eucalyptus regnans</i>	Mature	5.43	1.73	N/A	N/A	Present (northern aspect)	Present
DRY17MA	<i>Eucalyptus regnans</i>	Mature	5.60	1.78	N/A	N/A	Present (northern aspect)	N/A
DRY18MA	<i>Eucalyptus regnans</i>	Mature	3.55	1.13	N/A	Present	Present (northern aspect)	N/A
DRY19MA	<i>Eucalyptus regnans</i>	Senescing	6.38	2.03	Present (50m)	Numerous fissure hollows on northern aspect (20-40m)	Present (northern aspect)	N/A
DRY20MA	<i>Eucalyptus regnans</i>	Late-Mature	6.08	1.94	N/A	N/A	Present (north-western aspect)	Present in crown
DRY21MA	<i>Eucalyptus regnans</i>	Mature	5.69	1.81	Present (45m)	N/A	Present (north-western aspect)	40m (western aspect)
DRY22MA	<i>Eucalyptus regnans</i>	Senescing	4.66	1.48	Present (45m)	20m (eastern aspect)	N/A	28m (south-eastern aspect)
DRY23MA	<i>Eucalyptus regnans</i>	Mature	4.55	1.45	Present (40m)	Present	Present (south-western aspect)	N/A
DRY24MA	<i>Eucalyptus regnans</i>	Mature	5.89	1.87	N/A	40m (northern aspect)	Present (northern aspect)	N/A
DRY25AA	<i>Eucalyptus delegatensis</i>	Senescing	5.19	1.65	Present (30m)	25m (northern aspect)	Present (northern aspect)	N/A
DRY26AA	<i>Eucalyptus delegatensis</i>	Mature	5.40	1.72	x2 at 58m	N/A	N/A	N/A
DRY27AA	<i>Eucalyptus delegatensis</i>	Senescing	5.29	1.68	Present (60m)	30m (north-eastern aspect)	N/A	N/A
DRY28MA	<i>Eucalyptus regnans</i>	Mature	4.66	1.48	Present (40m)	Numerous present around 40m (north-western aspect)	Present (north-western aspect)	N/A
DRY29MA	<i>Eucalyptus regnans</i>	Mature	3.66	1.16	N/A	Fissure hollow at 30m (western aspect)	Present (western aspect)	N/A
DRY30MA	<i>Eucalyptus regnans</i>	Senescing	5.61	1.79	N/A	Fissure hollow at 20m (western aspect), hollow at 60m (north-eastern aspect)	Present (western aspect)	Multiple present
DRY31MA	<i>Eucalyptus regnans</i>	Senescing	5.20	1.65	Present (55m)	N/A	Present (western aspect)	Multiple present
DRY32MA	<i>Eucalyptus regnans</i>	Mature	5.14	1.64	N/A	12m (western aspect)	Present (western aspect)	Present in crown
DRY33MA	<i>Eucalyptus regnans</i>	Late-Mature	3.83	1.22	N/A	18m (south-western aspect)	Present (western aspect)	30m (northern aspect)

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
DRY34MA	<i>Eucalyptus regnans</i>	Late-Mature	6.79	2.16	N/A	50m (northern aspect)	Present (northern aspect)	15m (eastern aspect)
DRY35AA	<i>Eucalyptus delegatensis</i>	Late-Mature	4.20	1.34	N/A	N/A	N/A	x3 at 20-30m (north-eastern aspect), one at 50m (north-eastern aspect)
HIL01AA	<i>Eucalyptus delegatensis</i>	Mature	3.55	1.13	N/A	30m (north-eastern aspect)	N/A	N/A
HIL02AA	<i>Eucalyptus delegatensis</i>	Mature	4.33	1.38	N/A	6m (eastern aspect)	N/A	N/A
HIL03AA	<i>Eucalyptus delegatensis</i>	Mature	2.20	0.70	N/A	Fissure hollow at 20m (northern aspect)	N/A	N/A
HIL05AA	<i>Eucalyptus delegatensis</i>	Senescing	4.73	1.51	x2 at 40m	10m (eastern aspect)	N/A	N/A
HIL06AA	<i>Eucalyptus delegatensis</i>	Late-Mature	6.37	2.03	Present (20m)	20m (eastern aspect)	Present (western aspect)	N/A
HIL07AA	<i>Eucalyptus delegatensis</i>	Late-Mature	4.10	1.30	N/A	40m (south-eastern aspect)	Present (western aspect)	35m (western aspect), 35m (south-eastern aspect)
HIL08AA	<i>Eucalyptus delegatensis</i>	Mature	5.00	1.59	N/A	8m (South-east)	N/A	N/A
HIL09MA	<i>Eucalyptus regnans</i>	Late-Mature	5.70	1.81	N/A	N/A	N/A	2 X 10m (north)
HIL10MA	<i>Eucalyptus regnans</i>	Mature	3.75	1.19	N/A	20m (northern aspect)	N/A	N/A
HIL11MA	<i>Eucalyptus regnans</i>	Mature	4.85	1.54	N/A	30m (north-western aspect)	Present (western aspect)	30m (north-western aspect)
HIL12MA	<i>Eucalyptus regnans</i>	Mature	5.56	1.77	N/A	N/A	Present (southern aspect)	N/A
HIL13MA	<i>Eucalyptus regnans</i>	Late-Mature	4.82	1.53	N/A	30m (southern aspect)	Present (southern aspect)	N/A
HIL14MA	<i>Eucalyptus regnans</i>	Mature	5.83	1.86	N/A	15m, 20m, 30m (eastern aspect)	Present (eastern aspect)	N/A
HIL15MA	<i>Eucalyptus regnans</i>	Mature	5.36	1.71	Present (25m)	20m (north-western aspect)	Present (western aspect)	N/A
HIL16AA	<i>Eucalyptus regnans</i>	Late-Mature	7.00	2.23	x2 (35m, 40m)	8m (south-western aspect), 10m (southern aspect)	Present (western aspect)	10m (northern aspect)
HIL17AA	<i>Eucalyptus regnans</i>	Late-Mature	4.34	1.38	N/A	N/A	Present (southern aspect)	15m (south-eastern aspect), 12m and 18m

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
								(northern aspect)
HIL18AA	<i>Eucalyptus regnans</i>	Mature	5.22	1.66	N/A	N/A	Present (southern aspect)	20m and 25m (northern aspect), 35m (eastern aspect)
TOR01MA	<i>Eucalyptus regnans</i>	Late-Mature	6.19	1.97	N/A	N/A	Present (northern aspect)	40m (eastern aspect), 30m (north-western aspect), multiple crown branch hollows
TOR02MA	<i>Eucalyptus regnans</i>	Mature	4.87	1.55	N/A	6m (eastern aspect)	N/A	Limb hollow present
TOR03MA	<i>Eucalyptus regnans</i>	Senescing	6.63	2.11	Present (35m)	30m (eastern aspect)	x2 Present (southern aspect & northern aspect)	N/A
TOR04AA	<i>Eucalyptus delegatensis</i>	Mature	4.60	1.46	N/A	N/A	N/A	10m (south-eastern aspect), numerous fissure hollows on dead limbs
TOR05MA	<i>Eucalyptus regnans</i>	Mature	5.92	1.88	N/A	N/A	Present (western aspect)	N/A
TOR06MA	<i>Eucalyptus regnans</i>	Mature	2.79	0.89	N/A	N/A	Present (western aspect) which is occupied by Mountain Brushtail Possum	N/A
TOR07MA	<i>Eucalyptus regnans</i>	Late-Mature	5.60	1.78	Present (40m)	15m (north-eastern aspect)	Present (southern aspect & northern aspect)	30m (northern aspect)
TOR08MA	<i>Eucalyptus regnans</i>	Late-Mature	5.67	1.80	N/A	N/A	Present (eastern aspect & southern aspect)	N/A
TOR09AA	<i>Eucalyptus delegatensis</i>	Mature	5.00	1.59	N/A	N/A	Present (south-eastern aspect)	20m (western aspect)
TOR10MA	<i>Eucalyptus regnans</i>	Mature	3.11	0.99	N/A	N/A	Present (south-eastern aspect)	N/A
TOR11MA	<i>Eucalyptus regnans</i>	Mature	4.50	1.43	N/A	N/A	Basal decay present	35m (south-western aspect)
TOR12MA	<i>Eucalyptus regnans</i>	Late-Mature	3.73	1.19	Present (35m)	10m (western aspect)	Present (western aspect)	N/A
TOR13MA	<i>Eucalyptus regnans</i>	Senescing	4.44	1.41	N/A	Multiple on western aspect	Present (southern aspect)	N/A
TOR14MA	<i>Eucalyptus regnans</i>	Late-Mature	4.00	1.27	N/A	7m (north-eastern aspect)	N/A	x2 at 10m (northern aspect), 16m (north-eastern aspect), 17m (northern aspect)

Waypoint ID	Tree species	Growth stage	CBH (m)	DBH (m)	Trunk hollows (Dead-leading spout)	Trunk hollows (other)	Trunk hollows (basal)	Branch hollows
TOR15AA	<i>Eucalyptus delegatensis</i>	Late-Mature	2.56	0.81	N/A	N/A	N/A	15m (south-eastern aspect), 25m (eastern aspect) where large leading limb has dropped
TOR16MA	<i>Eucalyptus regnans</i>	Late-Mature	5.81	1.85	Present (50m)	N/A	Basal decaying present	N/A
TOR17MA	<i>Eucalyptus regnans</i>	Senescing	9.01	2.87	Present (50m)	35m (northern aspect)	Present (western aspect)	N/A
TOR18MA	<i>Eucalyptus regnans</i>	Late-mature	4.39	1.40	N/A	N/A	Present (northern aspect)	Multiple present in crown
TOR19MA	<i>Eucalyptus regnans</i>	Mature	4.25	1.35	N/A	15m (north-western aspect)	N/A	N/A
TOR20MA	<i>Eucalyptus regnans</i>	Mature	5.05	1.61	Present (40m)	N/A	Present (southern aspect)	N/A
TOR21AA	<i>Eucalyptus delegatensis</i>	Late-Mature	2.80	0.89	x3 Present in the crown (35m)	N/A	N/A	N/A

In addition to the 116 Zone 1a trees documented in Table 1 above, WOTCH surveyors also encountered hundreds of hollows from non-ash *Eucalyptus* species during the field surveys from this investigation. Many Mountain Gums (*Eucalyptus dalrympleana*) within the subject coupes were hollow-bearing, and tree hollows were also seen in Messmate (*Eucalyptus obliqua*) and Narrow-Leaved Peppermint (*Eucalyptus radiata*) trees within the coupes. There was also an abundance of dead HBTs observed within the subject coupes during this investigation, many of which appeared to have been Ash species. The hollow-dependent Gang Gang Cockatoo was also seen foraging amongst the canopy within coupes 289-502-0001 and 289-502-0002 during field surveys. We note that for 'MAR06AA', there was no live foliage visible on the tree as the crown had very recently snapped off. Live cambium was still visible on the trunk and we assessed the tree as still alive.

Sample photographs of obvious hollows



Figure 1a. Example of a hollow-bearing dead-leading spout on 'DRY25AA'. Note that all trees which contained dead-leading spouts such as 'DRY25AA' were also confirmed to be alive with cambium present and live foliage on the tree.



Figure 1b. Example of another hollow-bearing dead-leading spout on 'DRY22MA' with many fissure hollows present.



Figure 1c. Example of a trunk hollow on 'DRY08AA'.



Figure 1d. Example of another trunk hollow on 'DRY25MA'.



Figures 1e (left) and 1f (right). Examples of basal hollows on 'DRY17MA' & 'MAR18AA' from left to right respectively.



Figure 1g. Example of a branch hollow on 'MAR02MA'.

Full photographic evidence of Zone 1a HBTs

Figure 2 (attached) is a zip folder containing all the photographic evidence taken during this investigation, detailing the obvious hollows and characteristics of each hollow-bearing ash tree described in Table 1 above. The photographs are contained within

separate folders for each survey and subfolders named after the waypoint ID (Table 1) for each individual tree.

Relevant spatial data

Figure 3 (attached) is a zip folder containing the relevant spatial data from this investigation. This includes a GPX file containing the waypoints marked at the base of each Zone 1a tree during field surveys (Figure 3a), the individual sample Zone 1a patch polygons (Figure 3b), the merged/dissolved Zone 1a patch polygons (Figure 3c) and buffered merged/dissolved polygon (Figure 3d) as seen in Figures 4 (a-h) below.

Mapping of hollow-bearing ash trees and Zone 1a habitat

Figures 4 (a-f) below detail 6 individual patches (or areas) of LBP Zone 1a Habitat identified within this investigation. That is, these areas meet the tree density of *'more than 10 hollow bearing trees per 3 ha in patches greater than 3 ha'* as outlined within the **Planning Standards**. Some of these patches, such as Patch 2 (Figure 4b), also meet the density and constitute Zone 1a when buffered with various lengths. These 6 patches are a sample of the Zone 1a patches present that can be identified applying different methods (such as, varying buffers on perimeter trees) using the 116 Zone 1a HBTs recorded within this investigation. That is, the 6 patches identified in this report are not exhaustive and additional patches are also present. Figure 4g shows these 6 Zone 1a patches overlaid with one another and the total area which these patches encompass can be more clearly seen in Figure 4h.

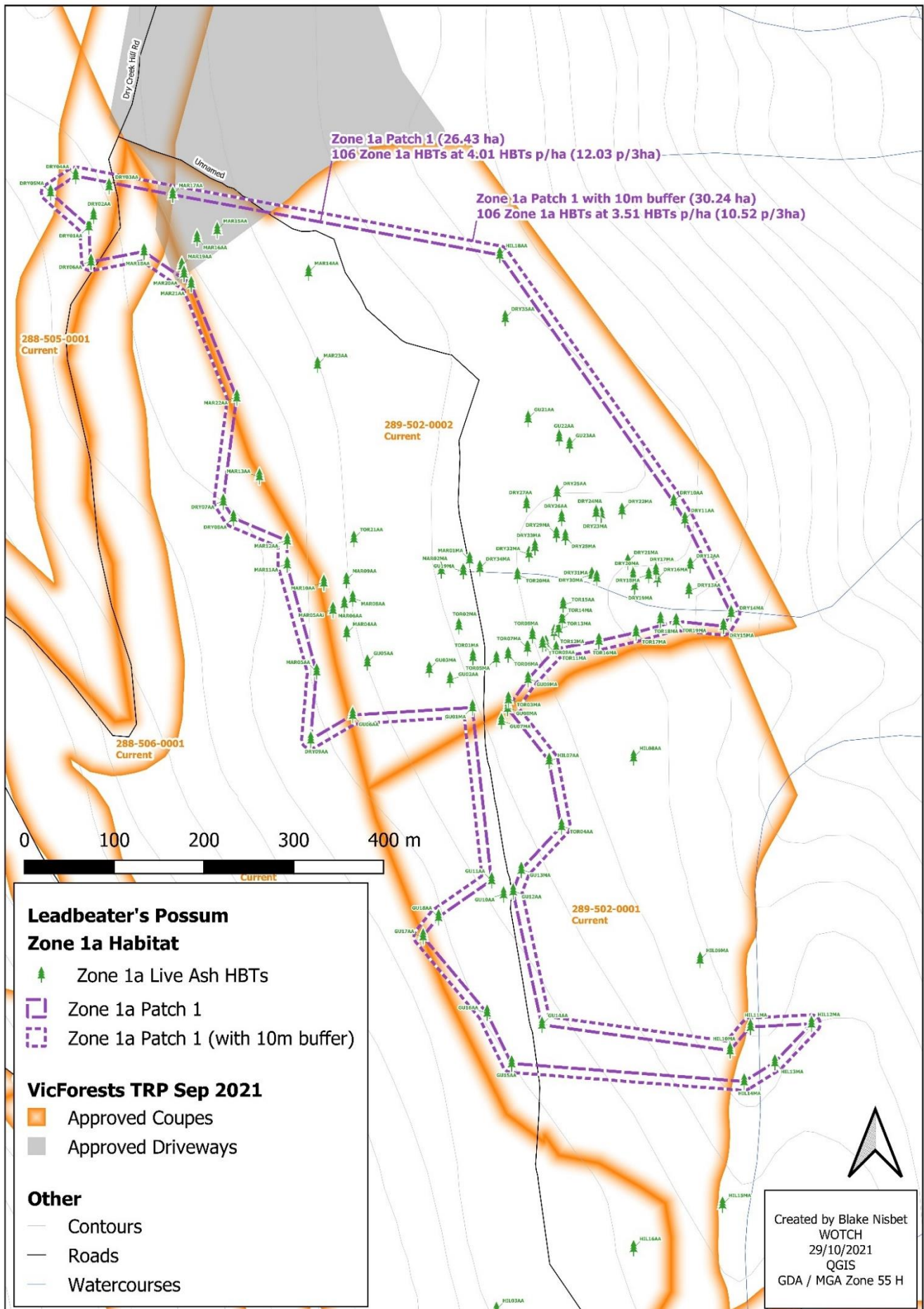


Figure 4a. Patch 1 and 1a - LBP Zone 1a Habitat patches (or areas) which were identified during this investigation.

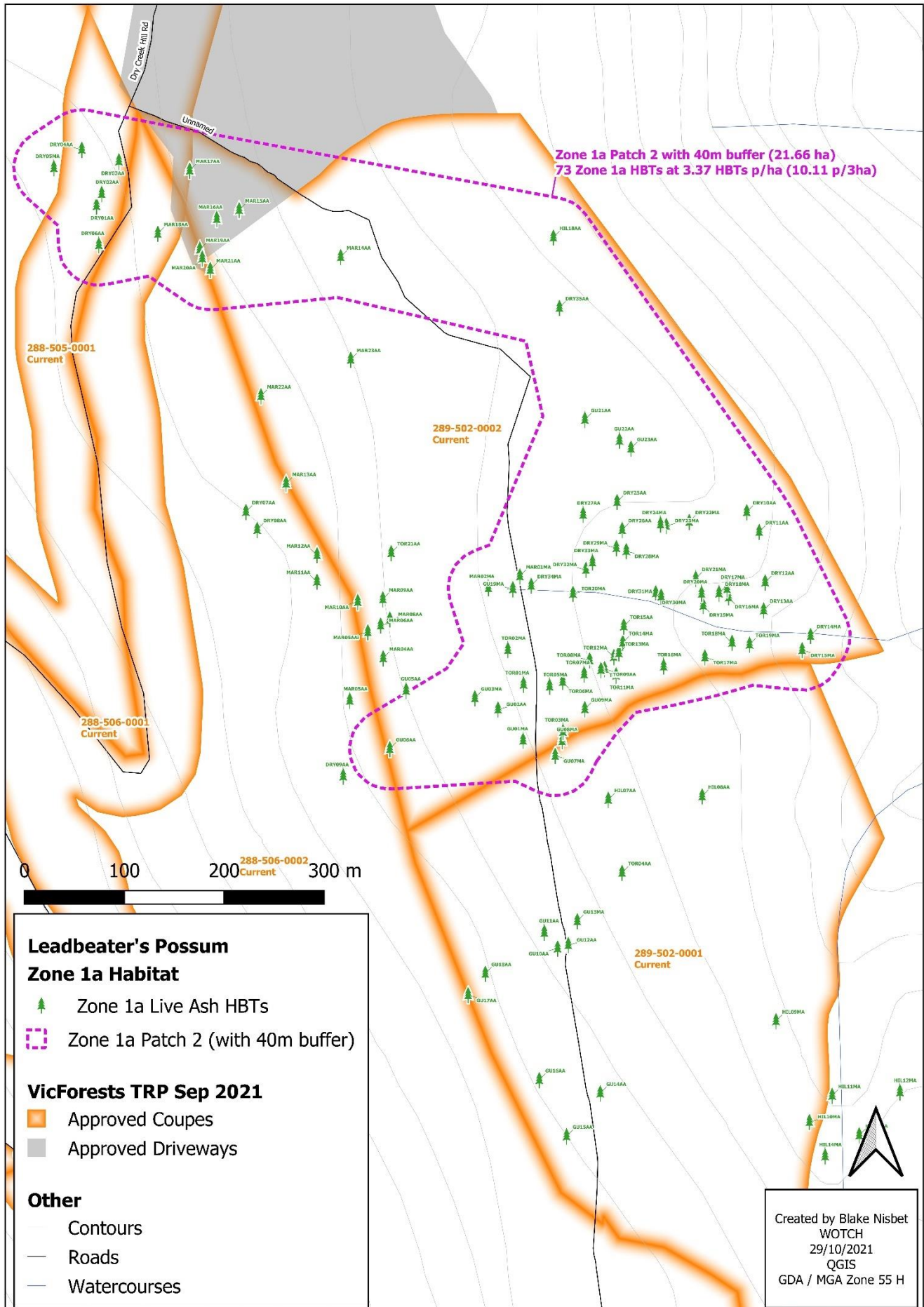


Figure 4b. Patch 2 - LBP Zone 1a Habitat patches (or areas) which were identified during this investigation.

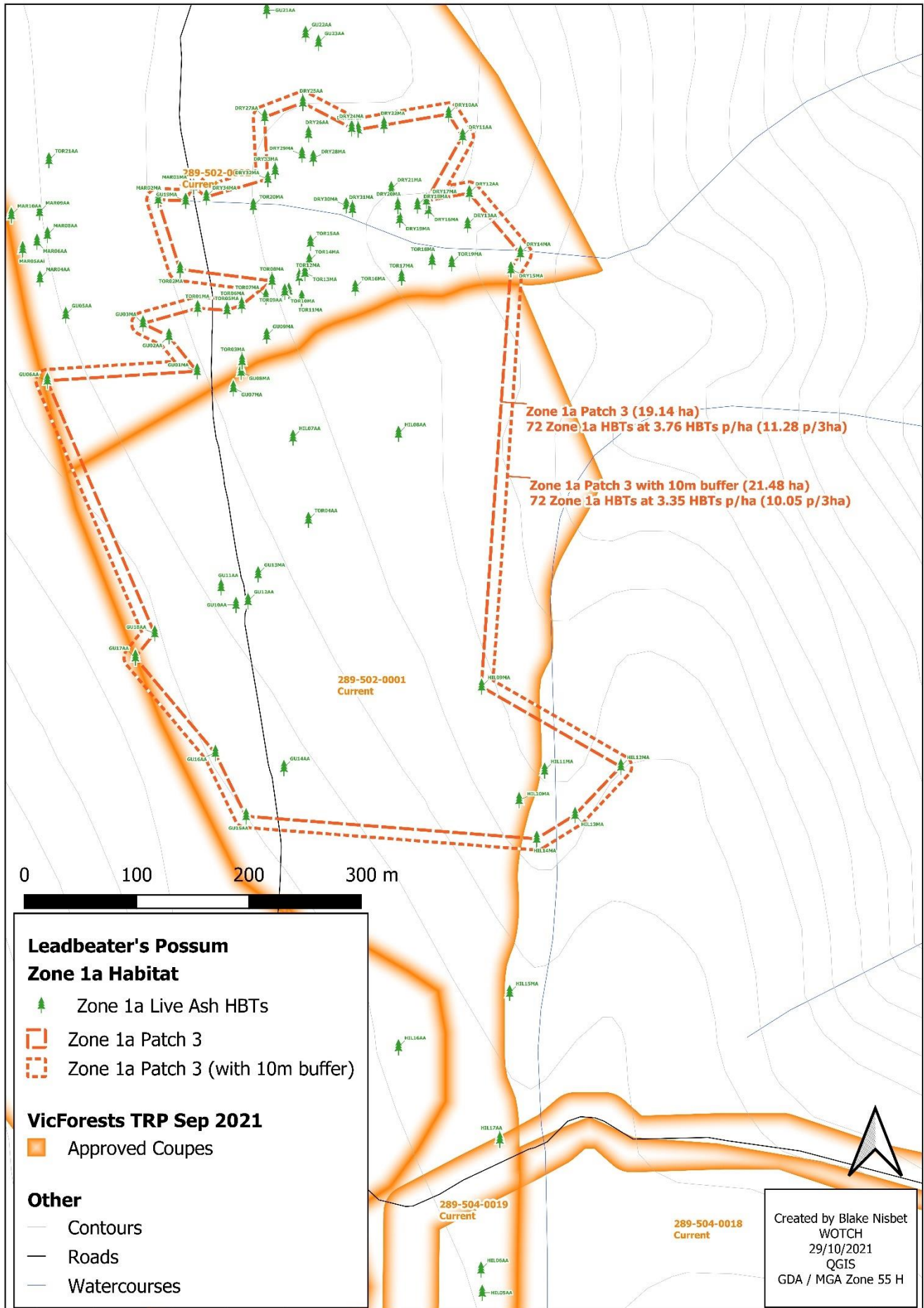


Figure 4c. Patch 3 and 3a - LBP Zone 1a Habitat patches (or areas) which were identified during this investigation.

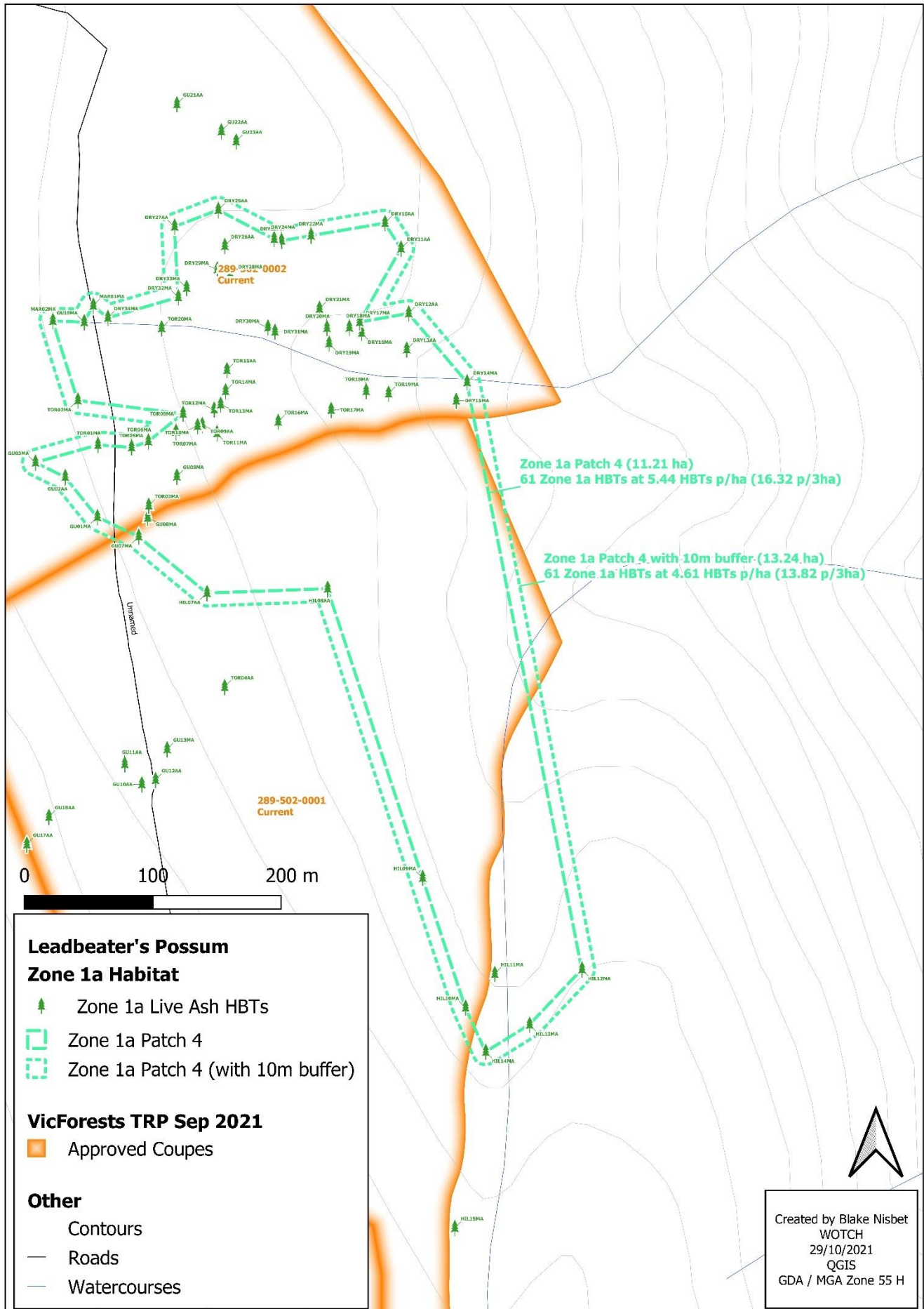


Figure 4d. Patch 4 and 4a - LBP Zone 1a Habitat patches (or areas) which were identified during this investigation.

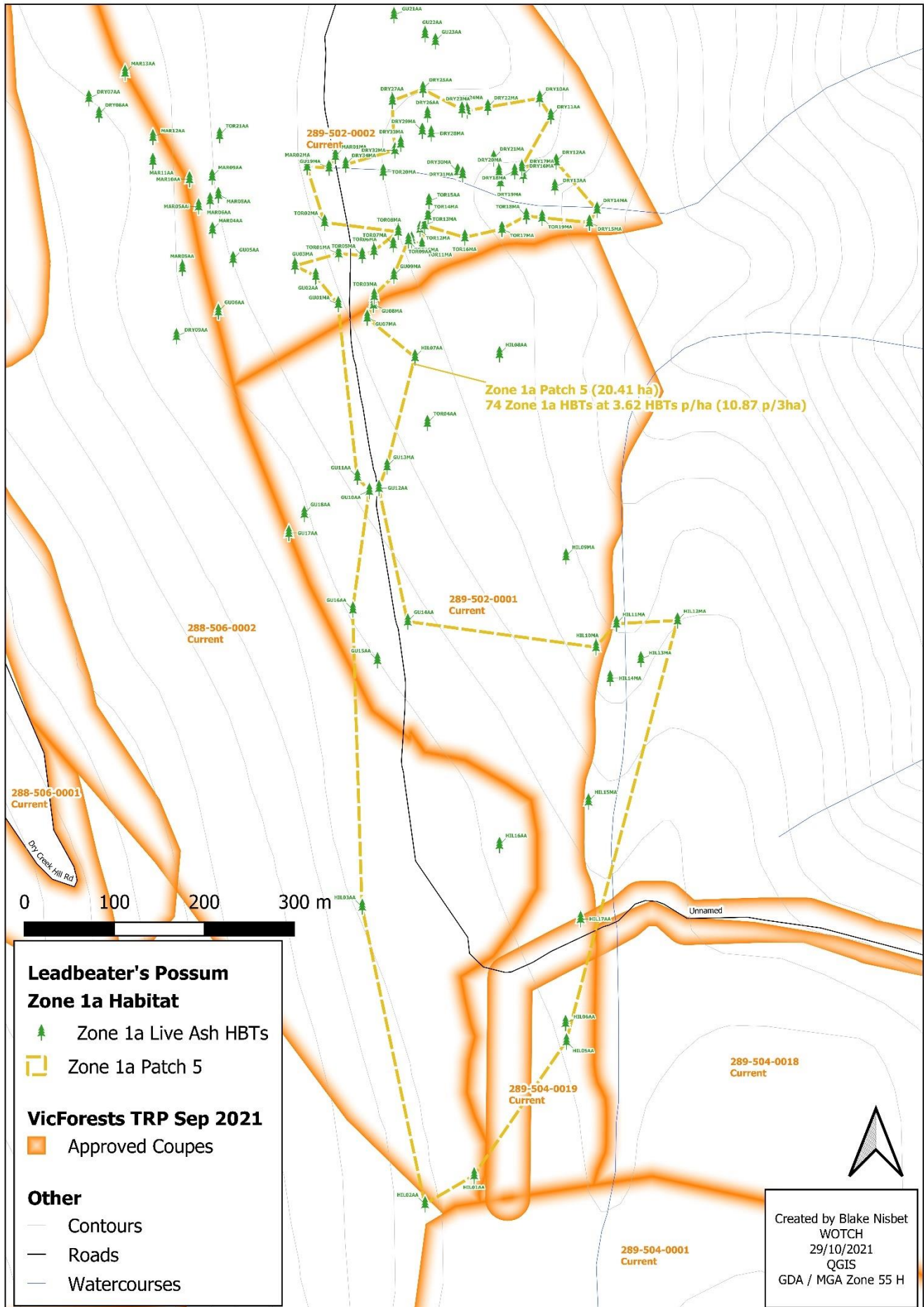


Figure 4e. Patch 5 - LBP Zone 1a Habitat patches (or areas) which were identified during this investigation.

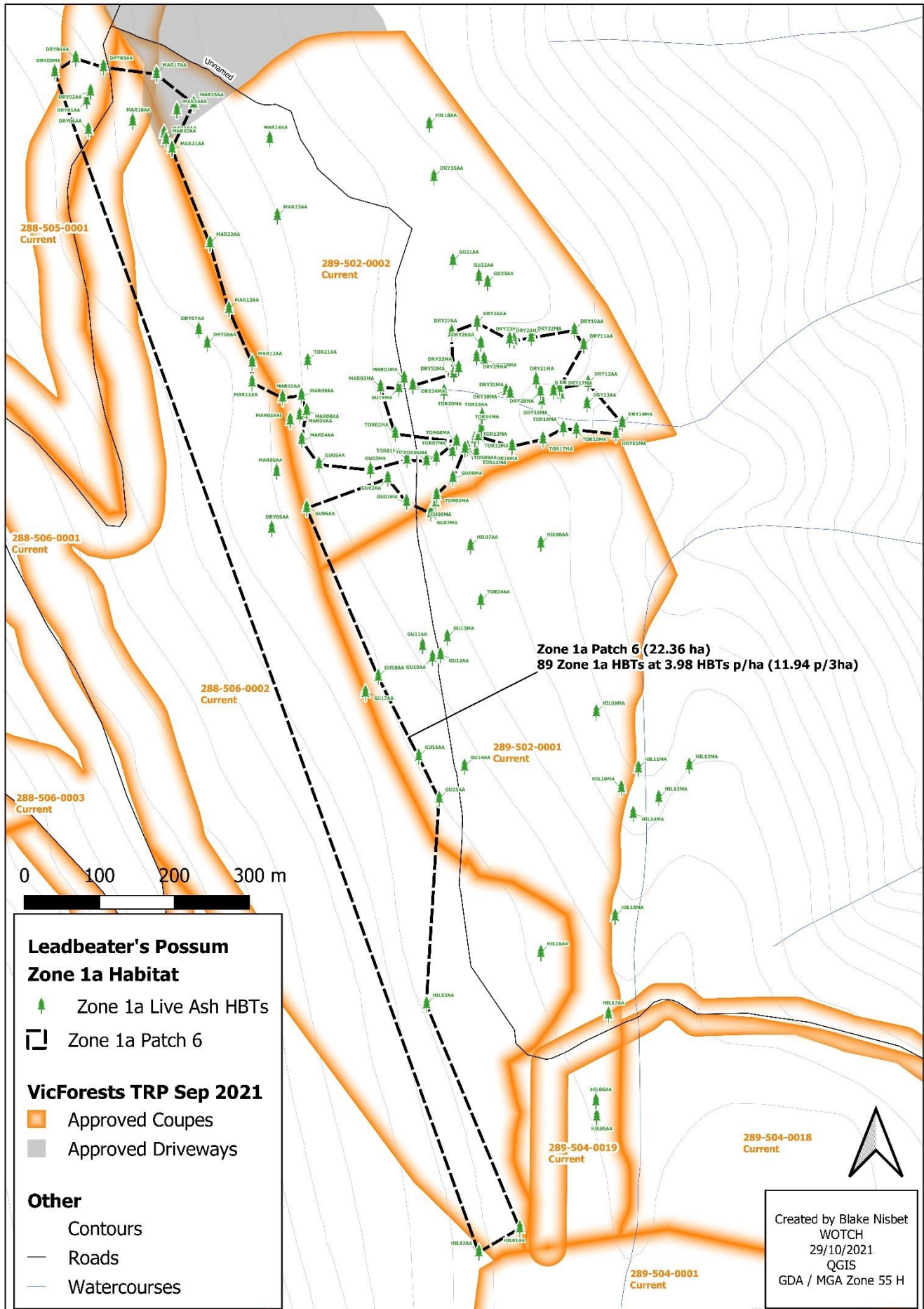


Figure 4f. Patch 6 - LBP Zone 1a Habitat patches (or areas) which were identified during this investigation.

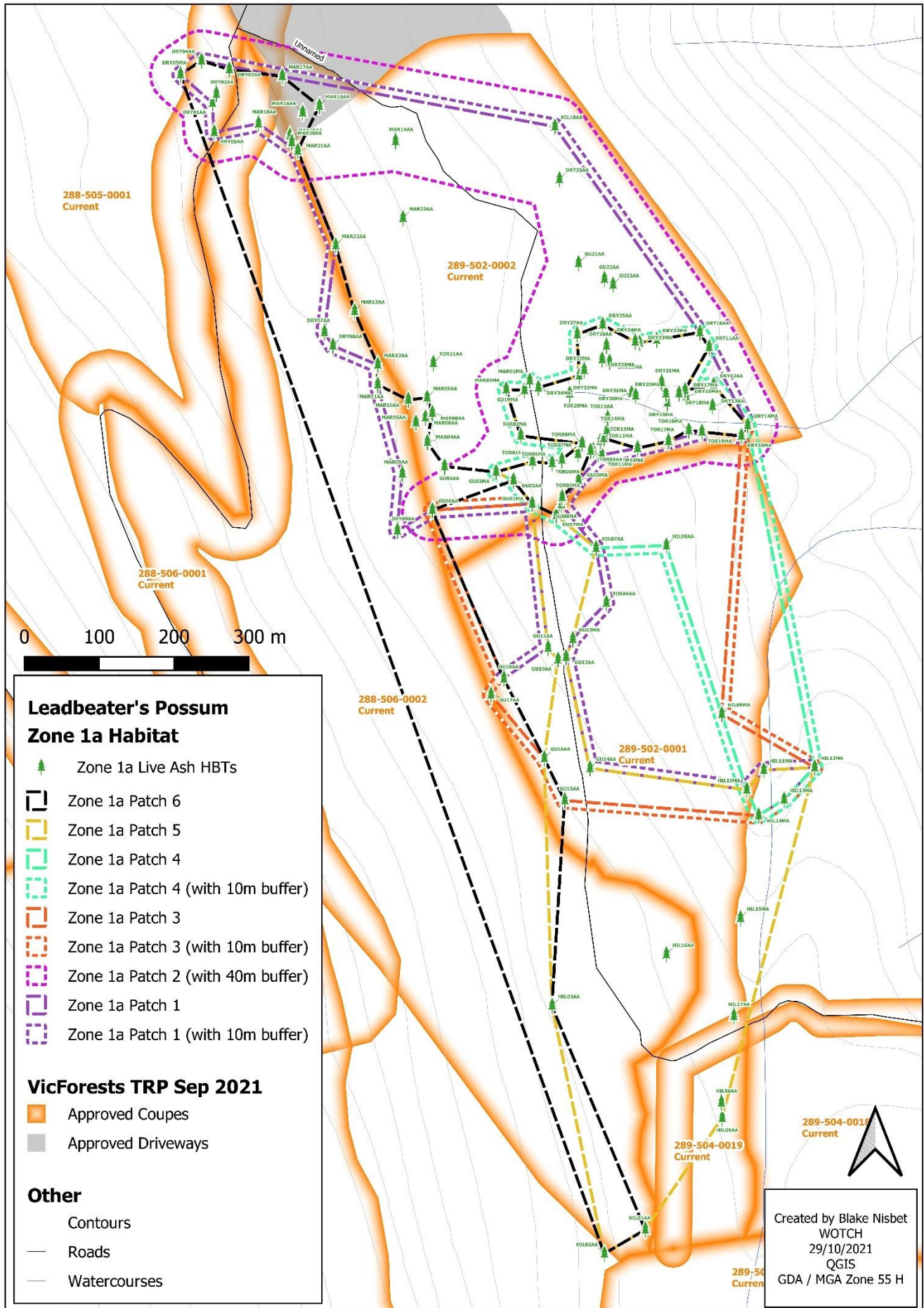


Figure 4g. LBP Zone 1a Habitat patches (or areas) from Figures 4(a-f) overlaid with one another.

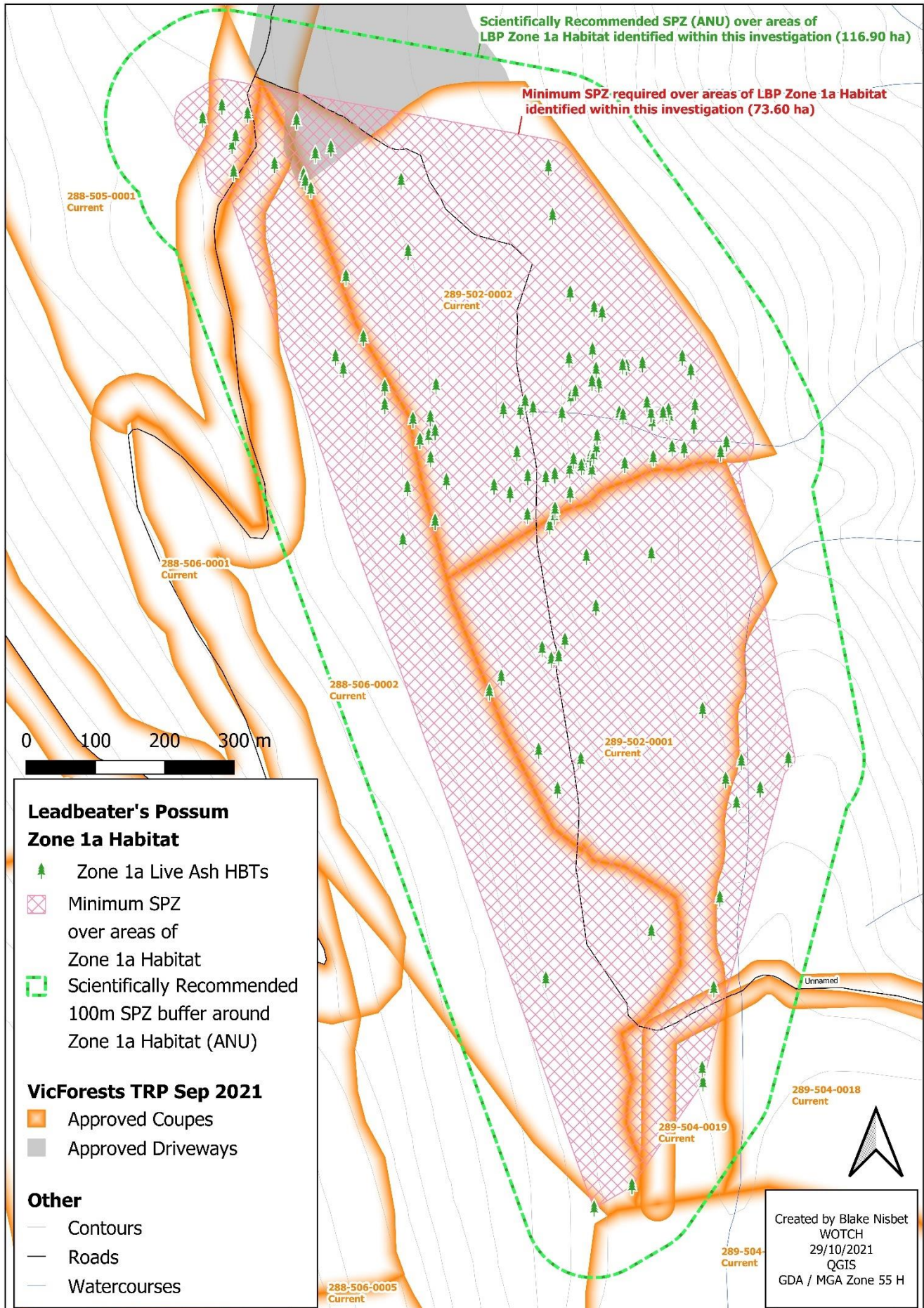


Figure 4h. Minimum required and scientifically recommended SPZ over LBP Zone 1a Habitat areas identified by WOTCH.

Table 2. Spatial analysis results of the 6 sample Zone 1a patches which were identified during this investigation.

LBP Zone 1a Habitat Patch	Total Area (ha)	Number of Zone 1a HBTs	Zone 1a HBTs p/ha	Zone 1a HBTs p/3ha
Patch 1 (Figure 4a)	26.43	106	4.01	12.03
Patch 1 with 10m buffer (Figure 4a)	30.24	106	3.51	10.52
Patch 2 with 40m buffer (Figure 4b)	21.66	73	3.37	10.11
Patch 3 (Figure 4c)	19.14	72	3.76	11.28
Patch 3 with 10m buffer (Figure 4c)	21.48	72	3.35	10.05
Patch 4 (figure 4d)	11.21	61	5.44	16.32
Patch 4 with 10m buffer (Figure 4d)	13.24	61	4.61	13.82
Patch 5 (Figure 4e)	20.41	74	3.62	10.87
Patch 6 (Figure 4f)	22.36	89	3.98	11.94

As seen in Figure 4g, all 116 of the Zone 1a HBTs (Table 1) are located within LBP Zone 1A Habitat patches (or areas) identified within this investigation.

Discussion

Field assessments were undertaken to assess the presence (or absence) of LBP Zone 1A habitat within and adjacent VicForests logging coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001. In total, 116 live hollow-bearing ash trees were identified and recorded through these assessments, all of which were either Mountain Ash (*Eucalyptus regnans*) or Alpine Ash (*Eucalyptus delegatensis*). These 116 trees occurred within numerous patches (or areas) which meet the tree density of 'more than 10 hollow bearing trees per 3 ha in patches greater than 3 ha' as outlined within the **Planning Standards**, see Excerpt 1 below. Some of these patches are mapped in Figures 4(a-f) and outlined in Table 2 of this report.

The following subsection, mandatory prescriptions, outlines the prescription for the identification of LBP Zone 1A habitat as well as some relevant Glossary terms.

Mandatory Prescriptions for LBP Zone 1A Habitat

It is mandatory for VicForests and any other organizations operating within state forests of Victoria to comply with all prescriptions outlined within the *Code of Practice for Timber Production 2014 (the Code)*. Further to organizations operating in state forest having to comply with the Code, it is also mandatory for them to comply with Appendix 5 of the 'Management Standards and Procedures for timber harvesting operations in Victoria's State forests 2014' (**MSPs**) which is the 'Planning Standards for timber harvesting operations in Victoria's State forests 2014' (**Planning Standards**).

The following excerpt is from Table 4 of the **Planning Standards**:

Excerpt 1 – showing the zoning management actions for the protection of Leadbeater's Possum habitat. (pp39)

Table 4 Detection based FMZ rules for fauna.

FMA	Common name	Scientific name	Zoning management actions	Management actions	Review
Central Highlands MAs	Leadbeater's Possum habitat	<i>Gymnobellus 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.

The following excerpts are from the Glossary section of the **MSPs**:

Excerpt 2 – the definition of a ‘hollow bearing tree’ as referred to in the establishment of Zone 1A habitat. (pp12)

‘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.

Excerpt 3 – the definition of ‘Ash’ as referred to in the definition of Zone 1a HBTs. (pp9)

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

Excerpt 4 – the definition of a ‘hollow’ as referred to in the ‘hollow bearing tree’ definition. (pp12)

‘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.

All 116 of the HBTs recorded during this investigation (Table 1) were live Ash trees containing obvious hollows which were identified from the ground. Binoculars and zoom-capable cameras were used in the field to confirm hollows, and all hollows described in Table 1 appeared to contain an entrance diameter in excess of 4cm. None of the hollows described in Table 1 had a height in excess of 30m. It’s very likely that the Zone 1a trees detailed in Table 1 contained more hollows which were unable to be seen from the ground due to obstructing foliage in the canopy and not being able to view the canopy of the trees from all angles. Similarly, the difficulties with hollow detectability may also have resulted in many live hollow-bearing ash trees within the investigation area (Figure i) having not been detected and recorded during this investigation. Thus, the density of Zone 1a HBTs calculated within these patches (Table 2) represent a minimum density and the true density is likely to exceed these figures. The abundance of hollows coupled with the diversity of Eucalypt species within coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001 results in extremely high biodiversity values within this patch of forest. The list of hollow-dependent fauna recorded within these subject coupes includes the Greater Glider, Yellow-bellied Glider, Feather-tailed Glider, Eastern-Pygmy Possum, Mountain Brushtail Possum, Agile Antechinus, Sooty Owl and the Gang Gang Cockatoo (WOTCH/FPSP).

Excerpt 1 from the **Planning Standards** above states that the mandatory zoning management action for LBP Zone 1a Habitat is

to “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.” To protect these patches (or areas) of LBP Zone 1a habitat (Figures 4a-f, Table 2), both for current and future use by the critically endangered LBP, these HBTs (Figure 4h, Table 1) must be protected from logging operations and post-harvest burns. This SPZ must protect these Zone 1a HBTs from edge effects such as windthrow and/or escaped or intensive post-harvest burns from surrounding logging operations. All 116 of the Zone 1a HBTs are located within patches (or areas) of Zone 1a Habitat which meet the density threshold for Zone 1a HBTs (Figure 4g), as outlined in Excerpt 1 of the **Planning Standards** above. As a result, all 116 Zone 1a HBTs (Table 1) must be protected within the established SPZ as prescribed in Excerpt 1 of the **Planning Standards** above. Figure 4h shows the minimum required SPZ which DELWP must establish over the areas of Zone 1a habitat identified within this investigation (Figure 4g, Table 2), consistent with the prescription for LBP Zone 1a Habitat in Excerpt 1 of the **Planning Standards** above. The scientifically recommended SPZ mapped in Figure 4h (green) of this report is based on the scientific recommendations for LBP Zone 1a SPZs and comes from the Australian National University (ANU).

Scientifically Recommended Special Protection Zones for LBP Zone 1a Habitat

ANU researchers have worked in the Mountain Ash forests of Victoria’s Central Highlands for over 30 years. Their extensive work has included studies of the “habitat requirements and population viability of arboreal marsupials (including Leadbeater’s Possum), populations of large old trees, forest dynamics, fire dynamics, logging impacts and numerous other investigations documented in more than 165 peer-reviewed scientific articles and seven books” (Lindenmayer et al. 2013).

In their paper ‘*New Restoration Forest Management Prescriptions to conserve Leadbeater’s Possum and Rebuild the cover of Ecologically Mature Forest in the Central Highlands of Victoria*’, Lindenmayer et al. 2013 suggest several new forest management prescriptions required to better conserve Leadbeater’s Possum and rebuild the ecologically mature forests of the Central Highlands. Some of these guidelines relevant to the protection of LBP Zone 1a Habitat as identified in this investigation are as follows:

Prescription 1 – Zone 1 Habitat for Leadbeater’s Possum

- 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

Prescription 3 – Protection of Hollow-bearing Trees

- 3.1 Each hollow-bearing tree (whether living or dead) will be surrounded by a buffer of unlogged forest measuring 100m in radius.
- 3.2 The locations of buffers to protect living and dead hollow-bearing trees will be mapped and the subsequent spatial data lodged to the Government Geographic Information System.
- 3.3 All trees 100 or more years old should be protected and surrounded by a buffer of unlogged forest measuring 100m in radius.

VicForests requirement to consider scientific knowledge when addressing biodiversity conservation risks

Under **the Code**, VicForests must observe the following actions regarding ‘Environmental Values in State Forests’ during planning, roading, harvesting, tending, and regeneration of native forests. The following are excerpts from **the Code**:

Excerpt 5– Mandatory actions - Addressing biodiversity conservation risks considering scientific knowledge. (pp34)

Mandatory Actions

Addressing biodiversity conservation risks considering scientific knowledge

- 2.2.2.1 Planning and management of timber harvesting operations must comply with relevant biodiversity conservation measures specified within the **Management Standards and Procedures**.
- 2.2.2.2 The **precautionary principle** must be applied to the conservation of biodiversity values. The application of the precautionary principle will be consistent with relevant monitoring and research that has improved the understanding of the effects of forest management on forest ecology and conservation values.
- 2.2.2.3 The advice of relevant experts and relevant research in conservation biology and flora and fauna management must be considered when planning and conducting timber harvesting operations.

Excerpt 6 – Definition of the precautionary principle as referred to in mandatory action 2.2.2.2. (pp15)

‘precautionary principle’ means when contemplating decisions that will affect the environment, careful evaluation of management options be undertaken to wherever practical avoid serious or irreversible damage to the environment; and to properly assess the risk-weighted consequences of various options. When dealing with threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

VicForests is required to comply with clause 2.2.2.2 the ‘precautionary principle’ of **the Code**, which when dealing with the conservation of biodiversity values such as the LBP Zone 1a habitat identified in this report, requires VicForests to apply the precautionary principle “consistent with relevant monitoring and research that has improved the understanding of the effects of forest management on forest ecology and conservation values”. The long-term research and monitoring by ANU in Victoria’s ash forests demonstrates that to effectively protect the conservation value of Zone 1a habitat and HBTs, a 100m buffer of unlogged forest is required around patches of Zone 1a habitat. The areas of Zone 1a habitat identified in this report (Figures 4g-h) therefore requires a 100m SPZ buffer around the perimeter to comply with clause 2.2.2.2 ‘the precautionary principle’ of **the code**. This 100m SPZ buffer is mapped in Figure 4h of this report and the spatial data depicting this area is attached as Figure 3d.

Friends of Leadbeater’s Possum Vs VicForests:

The following are excerpts from the honorable Justice Mortimer’s ruling in the Federal Court of Australia, regarding the identification of LBP Zone 1a Habitat in the Federal Court Case of ‘Friends of Leadbeater’s Possum vs VicForests’.

1236 Mr Shepherd was provided with VicForests’ map showing what were admitted by VicForests for the purposes of the proceeding to be hollow-bearing trees for the purposes of the concept of Zone 1A habitat. He was also provided with the waypoint location for the tree known as FE010. He conducted a spatial analysis of the tree points using three different methods and identified multiple configurations of “patches” of forest which would result in part of the forest in the nett harvest area of Blue Vein being classified as Zone 1A habitat, including the cohort of trees in the north of the coupe which VicForests (and

ultimately DELWP) had excluded from such a classification. In summary, some of the “patches” were linear, and some were rounder. In a summary of Mr Shepherd’s conclusions, the applicant submitted (at [519] of its closing written submissions):

Mr Shepherd said a ratio of 3.333 trees per hectare is equivalent to 10 trees per 3 ha. The patch using Method 1 had 15m buffers on perimeter trees, contained 11 trees, was 3.187ha with 3.452 trees per ha. Method 2 had no buffers on perimeter trees, contained 25 trees, was 7.199ha with 3.473 trees per hectare. Method 3 was a 15m wide linear shape including 25 trees, was 6.205 ha with 4.029 trees per hectare.

1237 The applicant’s submissions then explain in detail the other results produced by Mr Shepherd, depending on variables such as the buffer size and reliance or non-reliance on tree FE010. The applicant’s point, as I understand it, is that all of these methods were permissible because what regulated VicForests’ conduct of forestry operations was the content of the Code and the Management Standards and Procedures, without what I understood the applicant to contend was a “gloss” put on those obligations by DELWP’s policy document about survey methods.

....

1247 Accordingly, I accept the applicant’s argument. If it is relevant, which I do not consider it is, the decision by DELWP was obviously driven by a strict and technical application of the terms of its own policy, in what had on the evidence become a hotly contested dispute between it and VicForests. Why DELWP decided, in the end, and despite what was initially said by Dr Lumsden, to take such a technical approach is not revealed by the evidence and in any event not relevant to the resolution of the applicant’s allegations. The present context is different. For the purposes of s 38, what regulates the conduct of forestry operations in the CH RFA region is the Code and the Management Standards and Procedures, which includes the Planning Standards. The Management Standards and Procedures have a clear prescription about Zone 1A habitat. They say nothing about the need for less than a 100 m gap between hollow-bearing trees. The “boundary” which the Management Standards and Procedures, by reference to Table 4 of the Planning Standards, impose is a “patch” greater than 3 ha. It is within this “patch” that the requisite density of hollow-bearing trees per 3 ha (10) must be present.

Consistent with the honorable Justice Mortimer’s ruling in this case, all the patches of LBP Zone 1a Habitat identified and outlined in this report (Figures 4a-f, Table 2) are permissible. They all meet the prescription outlined for the protection of LBP Zone 1a Habitat in Appendix 5 of the **MSPs**, the **Planning Standards**, the content which regulates VicForests conduct of forestry operations. As mentioned previously, there are additional patches of LBP Zone 1a Habitat that can be delineated and identified using the 116 Zone 1a HBTs (Table 1). The 6 patches which were mapped and outlined in this report (Figures 4a-f, Table 2) are a sample of patches of Zone 1a present, which when merged together clearly identify the extent of the LBP Zone 1a Habitat as seen in Figure 4h. The **Planning Standards** require the protection of **all** patches of Zone 1a Habitat, not the protection of some patches but not others. This is achieved by protection of the merged areas (Figure 4h). Protecting one of these areas (eg Figure 4a) and not others would contravene the prescription outlined in the **Planning Standards** which states to “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”. Protection of all areas of Zone 1a Habitat is consistent with the ruling of the honorable Justice Mortimer, as seen in the extracts above. DELWP must, at a minimum, establish a SPZ over these areas of LBP Zone 1a Habitat which is mapped in Figure 4h (hashed red) and attached by way of spatial data as Figure 3c. This minimum SPZ is 73.60 ha in size and encompasses habitat within coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001 (Figure 4h).

Conclusion and Recommendations

This investigation identified and documented LBP Zone 1a habitat totaling 73.60 ha within the Rubicon State Forest. This LBP Zone 1a Habitat is scheduled for logging within VicForests coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001, and the following actions must be undertaken by DELWP to protect this critical habitat for the Leadbeater's Possum.

- DELWP must restrain VicForests from commencing logging operations within the LBP Zone 1a Habitat identified within this investigation, as mapped in Figure 4h (hashed red) of this report (attached spatial data Figure 3c). This area represents the minimum required SPZ which DELWP must establish for this LBP Zone 1a Habitat, consistent with the prescription for protecting LBP Zone 1a Habitat outlined in the **Planning Standards**. All 116 Zone 1a HBTs must be protected within the established SPZ as they are all located within areas of LBP Zone 1a Habitat identified within this report.
- DELWP must establish a SPZ over this LBP Zone 1a Habitat (Figure 4h: Hashed red) and ensure that VicForests is complying with the precautionary principle for this conservation value, which would involve establishing a SPZ buffer of at least 100m around the LBP Zone 1a Habitat (Figure 4h: Green) as recommended by the ANU (attached spatial data Figure 3d).
- WOTCH also considers that the required density of Zone 1a HBTs should account for the scientific recommendations of the ANU, which recommends that "any area of forest of 3 hectares or more that supports eight or more living or dead hollow-bearing trees per 3 hectares" be protected as Zone 1 LBP habitat. This would be a precautionary approach to the management of Zone 1a conservation values that is consistent with relevant monitoring and research. It is overly concerning that LBP Zone 1a habitat is currently an extreme rarity within the Central Highlands as this is supposed to protect the habitat for the critically endangered LBP.
- Coupes 289-502-0001, 289-502-0002, 288-506-0002 and 288-505-0001 should be removed from VicForests TRP as it contains current and future suitable habitat for the critically endangered Leadbeater's Possum.

Note: This report is limited to addressing WOTCH Inc's findings and recommendations relating to Zone 1A Leadbeater's Possum habitat only, at the present time. WOTCH Inc does not consider that logging operations in coupes subject of this report comply with other provisions of the Code and Management Standards, or with cl 2.2.2.2 of the Code in other respects, including in relation to other species.

References

Lindenmayer, D., Blair, D., McBurney, L. and Banks, S. (2013). *New Restoration Forest Management Prescriptions to Conserve Leadbeater's Possum and Rebuild the Cover of Ecologically Mature Forest in the Central Highlands of Victoria*. Canberra: ANU Research Publications.

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Lindenmayer, D.B., Cunningham, R.B., Tanton, M.T., Smith, A.P., and Nix, H.A. (1991c). 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* **40**, 289-308.



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