

Supplementary material for

Range extension of Leadbeater’s possum (*Gymnobelideus leadbeateri*)

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Table S1. Vegetation Surveys

| Measure | Description |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Upper Strata (canopy) | |
| Dominant Stand Type | Description of SFRI species according to Silviculture Reference Manual |
| Species Composition | ≤4 most common Eucalyptus species in descending order of their relative foliar projective cover. |
| Basal Area (m ²) | Mean basal area of trees contributing to upper strata within a unit area (convert basal sweep factor to its area) |
| Age Class Distribution | Visual assessment of dominant age class |
| Diameter Distribution (cm) | DBH range of trees contributing to upper strata |
| Stand Condition | Description of evidence of recent disturbance events on the upper strata |
| Foliar Projective Cover (%) | Estimated FPC % of Canopy and sub canopy cover |
| Top Height (m) | Height of tallest tree in search area |
| Habitat Distribution | Broad description of density of HBTs, did they occur singularly, small patches or widespread |
| Distance from bait tree to closest Habitat Tree (m) | Distance from bait tree (m) to closest hollow-bearing tree (HBT) |
| Tree form category (HBT) | Tree form and hollow type category following Nelson et al. 2017. Form classes can take values 0.5, 1–8 |
| Species | Species of HBT |
| Bearing from bait tree (°) | Bearing of HBT from bait tree (°) |
| Distance from bait tree (m) | Distance of HBT from bait tree (m) |
| Middle Strata | |
| Species composition | List of species making up the understory in order of dominance |
| Age Class Distribution | Based on last fire event |

| | |
|----------------------------------------|----------------------------------------------------------------------------------------------------|
| Canopy Distribution | Broad description of density of understory, did they occur singularly, small patches or widespread |
| Canopy connectivity (%) | Estimate of % of crown cover that is connected (within 1m) to adjacent crown cover |
| Canopy FPC (%) | Estimate of FPC of understory species |
| Top Height (m) | Average height of understory species |
| Basal area of Acacia (m ²) | Basal area sweep taken at each bait tree then averaged. |

Lower Strata

| | |
|---------------------|----------------------------------------------------------------|
| Species composition | List of species making up the understory in order of dominance |
| FPC (%) | Estimate of FPC of understory species |
| Top Height (m) | Average height of understory species |

Table S2. Hollow bearing tree (HBT) form class numbers at each positive detection site

| Site | Total no. HBT | HBT/ha | Percent hollow-bearing tree (HBT) in Form Class (0.5–8) | | | | | | | | |
|------|---------------|--------|---------------------------------------------------------|------|------|------|------|-----|------|------|-----|
| | | | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 31 | 6.33 | 3.2 | 6.5 | 0.0 | 58.1 | 22.6 | 6.5 | 0.0 | 0.0 | 3.2 |
| 2 | 60 | 15.83 | 6.7 | 6.7 | 58.3 | 5.0 | 5.0 | 6.7 | 0.0 | 6.7 | 5.0 |
| 3 | 60 | 12.24 | 3.3 | 16.7 | 63.3 | 5.0 | 6.7 | 0.0 | 3.3 | 0.0 | 1.7 |
| 4 | 22 | 3.86 | 9.1 | 54.5 | 18.2 | 0.0 | 4.5 | 0.0 | 4.5 | 4.5 | 4.5 |
| 5 | 34 | 6.04 | 2.9 | 11.8 | 14.7 | 11.8 | 5.9 | 5.9 | 14.7 | 29.4 | 2.9 |
| 6 | 57 | 15.83 | 0.0 | 73.7 | 19.3 | 3.5 | 1.8 | 0.0 | 1.8 | 0.0 | 0.0 |

Table S3. EVC Forest Type Groupings

All mixed-species forests included vegetation classes where there was a dominant overstorey (20-40%) of re-sprouting eucalypts and at least 10% cover by secondary tree layer (e.g. *Acacia* species). HNF – Highlands-Southern Fall bioregion, HSF–Highlands-Northern Fall.

| Forest category | EVC and bioregion included | Description |
|--------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ash | 29 VicAlps | Damp Forest: 40% cover of <i>E. regnans</i> , <i>E. cypellocarpa</i> and % cover secondary tree layer of <i>Olearia argophylla</i> , <i>Acacia dealbata</i> . |
| | 30 VicAlps, HSF, HNF | Wet Forest: 40% cover <i>E. regnans</i> , <i>E. delegatensis</i> and 30% cover secondary tree layer (e.g. <i>Acacia spp.</i> , <i>Pomaderris aspera</i> , <i>Olearia argophylla</i> , <i>Pittosporum bicolor</i>). |
| | 35 VicAlps, HSF, HNF | Tableland Damp Forest: 40% cover <i>E. regnans</i> , <i>E. delegatensis</i> and 20% cover secondary tree layer (e.g. <i>Acacia spp.</i>) |
| | 38 HNF, VicAlps | Montane Damp Forest: 40% cover <i>E. delegatensis</i> , <i>E. radiata</i> , <i>E. rubida</i> , <i>E. dalrympleana</i> and 15% cover secondary tree layer of <i>Acacia spp.</i> |
| | 39 VicAlps, HSF, HNF | Montane Wet Forest: 40% cover <i>E. regnans</i> , <i>E. delegatensis</i> , <i>E. nitens</i> and 20–30% cover secondary tree layer of <i>Acacia spp.</i> , <i>Olearia argophylla</i> or <i>Lomatia fraseri</i> . |
| | 201 HNF, VicAlps | Shrubby Wet Forest: 40% cover <i>E. delegatensis</i> , <i>E. croajingolensis</i> , <i>E. obliqua</i> and 20% cover secondary tree layer of <i>Acacia spp.</i> |
| Herb-rich foothill | 23 VicAlps, HSF, HNF | Herb-rich Foothill Forest: 40% cover of <i>E. radiata</i> , <i>E. dives</i> , <i>E. obliqua</i> , <i>E. viminalis</i> , <i>E. cypellocarpa</i> and 10% cover secondary tree layer of <i>Acacia spp.</i> |
| Mixed species | 16 HNF | Lowland Forest: 30% cover <i>E. obliqua</i> , <i>E. radiata</i> and 10% cover <i>Pomaderris aspera</i> and <i>Acacia dealbata</i> |
| | 18 VicAlps, HSF, HNF | Riparian Forest: Dominated by tall eucalypts, 40% cover (e.g. <i>E. viminalis</i> , <i>E. cypellocarpa</i> , |

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|----------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p><i>E. dives</i>, <i>E. rubida</i>, <i>E. obliqua</i>) and 20% cover secondary tree layer of wattles (e.g. <i>Acacia dealbata</i>, <i>A. melanoxylon</i>) and small trees (e.g. <i>Pomaderris aspera</i>).</p> |
| | 21 VicAlps, HSF, HNF | Shrubby Dry Forest: 30% cover of <i>E. cypellocarpa</i> , <i>E. obliqua</i> , <i>E. radiata</i> and 10% cover secondary tree layer of <i>Pomaderris aspera</i> . |
| | 29 HSF, HNF | Damp Forest: 40% cover of <i>E. obliqua</i> , <i>E. radiata</i> and 30% cover secondary tree layer (e.g. <i>Acacia spp.</i> , <i>Pomaderris aspera</i> , <i>Olearia argophylla</i> , <i>Lomatia fraseri</i>). |
| | 38 HSF | Montane Damp Forest: 40% cover of <i>E. cypellocarpa</i> , <i>E. obliqua</i> , <i>E. radiata</i> and 25% cover secondary tree layer of <i>E. dives</i> , <i>Acacia dealbata</i> and <i>A. melanoxylon</i> . |
| | 47 HNF | Valley Grass Forest: 20% cover of <i>E. rubida</i> , <i>E. radiata</i> , <i>E. melliodora</i> , <i>E. obliqua</i> and 10% cover secondary tree layer of <i>Acacia spp.</i> |
| | 169 VicAlps, HSF, HNF | Dry Valley Forest: 30% cover of <i>E. macrorhyncha</i> , <i>E. cypellocarpa</i> , and 15% cover secondary tree layer of <i>Olearia argophylla</i> , <i>Acacia dealbata</i> . |
| | 201 HSF | Shrubby wet Forest: 40% cover <i>E. obliqua</i> , <i>E. croajingolensis</i> and 30% cover secondary tree layer of <i>Acacia dealbata</i> , <i>Olearia argophylla</i> , <i>Lomatia fraseri</i> . |
| | 319 VicAlps, HSF, HNF | Montane Herb-rich Woodland: 40% cover of <i>E. radiata</i> , <i>E. delegatensis</i> and 10% cover secondary tree layer of <i>Acacia dealbata</i> , <i>Notelea ligustrina</i> . |
| Snow gum | 37 VicAlps, HSF, HNF | Montane Grassy Woodland: 20% cover of <i>E. pauciflora</i> , <i>E. dives</i> , <i>E. rubida</i> , 5% cover secondary tree layer of <i>Acacia spp.</i> |
| | 43 VicAlps, HSF, HNF | Sub-alpine Woodland: 15% cover <i>E. pauciflora</i> and subspecies, 5% cover secondary tree layer of <i>Acacia spp.</i> |

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| Rainforest | 31 VicAlps, HSF, HNF | Cool Temperate Rainforest: 50% cover <i>Nothofagus cunninghamii</i> , <i>Atherosperma moschatum</i> (and <i>E. regnans</i> HSF, <i>Acacia</i> spp. HSF and VicAlps) and 10% cover of secondary tree layer of <i>Pittosporum bicolor</i> . |
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Table S4. Survey locations

| Survey Method | Easting | Northing |
|---------------|--------------|---------------|
| Remote Camera | 454064.44462 | 5844881.27005 |
| Remote Camera | 454026.18564 | 5844887.42666 |
| Remote Camera | 450023.58456 | 5842503.51181 |
| Remote Camera | 450065.97378 | 5842538.57446 |
| Remote Camera | 451730.71581 | 5837868.35275 |
| Remote Camera | 451764.89320 | 5837853.40013 |
| Remote Camera | 455358.44665 | 5839925.99159 |
| Remote Camera | 455325.15688 | 5840032.51870 |
| Remote Camera | 455120.42514 | 5839982.58410 |
| Remote Camera | 455080.47754 | 5840075.79527 |
| Remote Camera | 454138.00168 | 5832865.82414 |
| Remote Camera | 454040.24385 | 5832751.26410 |
| Remote Camera | 454043.29879 | 5832671.83584 |
| Remote Camera | 458505.77309 | 5830170.50411 |
| Remote Camera | 458433.12420 | 5830170.07929 |
| Remote Camera | 458487.92956 | 5830102.10374 |
| Remote Camera | 449025.99998 | 5842254.99997 |
| Remote Camera | 449051.99996 | 5842206.99997 |
| Remote Camera | 449166.00000 | 5842192.99997 |
| Remote Camera | 458812.00000 | 5840045.99998 |
| Remote Camera | 458858.00005 | 5840016.99997 |
| Remote Camera | 447940.87754 | 5840509.24673 |
| Remote Camera | 447995.91172 | 5840510.14671 |
| Remote Camera | 448014.44576 | 5840464.58846 |
| Remote Camera | 450849.31856 | 5839313.38804 |
| Remote Camera | 450871.30145 | 5839402.83276 |
| Remote Camera | 450425.03548 | 5840580.49541 |
| Remote Camera | 450333.14018 | 5840517.44411 |
| Remote Camera | 450388.65331 | 5840438.26250 |
| Remote Camera | 449422.38223 | 5841837.97346 |
| Remote Camera | 449399.53439 | 5841771.07954 |
| Remote Camera | 452591.92698 | 5838876.22437 |
| Remote Camera | 452508.51112 | 5838797.52763 |
| Remote Camera | 452565.93766 | 5838764.01686 |
| Remote Camera | 447524.84297 | 5835234.62231 |
| Remote Camera | 447572.77856 | 5835282.63490 |

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| Remote Camera | 447526.77302 | 5835301.39009 |
| Remote Camera | 445571.49146 | 5834688.15111 |
| Remote Camera | 450833.44590 | 5839260.59306 |
| Remote Camera | 447060.13849 | 5836217.27993 |
| Remote Camera | 447005.84932 | 5836150.36216 |
| Remote Camera | 447074.29052 | 5836074.24357 |
| Remote Camera | 445569.65164 | 5834587.72801 |
| Remote Camera | 445523.35439 | 5834650.66592 |
| Remote Camera | 446803.36198 | 5841851.92373 |
| Remote Camera | 446938.20350 | 5841757.36999 |
| Remote Camera | 447063.26980 | 5841810.31531 |
| Thermal Camera & Spotlighting | 453301.07555 | 5844260.84625 |
| Thermal Camera & Spotlighting | 454649.05423 | 5842970.34343 |
| Thermal Camera & Spotlighting | 446283.08467 | 5833953.64330 |
| Thermal Camera & Spotlighting | 449657.25029 | 5841428.23770 |
| Thermal Camera & Spotlighting | 453412.74101 | 5843311.33695 |
| Thermal Camera & Spotlighting | 453469.87224 | 5843236.77586 |
| Thermal Camera & Spotlighting | 453290.25456 | 5841952.38513 |
| Thermal Camera & Spotlighting | 452613.28214 | 5842485.75279 |
| Thermal Camera & Spotlighting | 453293.15456 | 5841945.74371 |
| Thermal Camera & Spotlighting | 452056.54531 | 5836445.47084 |
| Thermal Camera & Spotlighting | 452665.75038 | 5836075.83940 |
| Thermal Camera & Spotlighting | 455281.67140 | 5842864.29802 |
| Thermal Camera & Spotlighting | 449769.76407 | 5842270.07543 |
| Thermal Camera & Spotlighting | 450613.66877 | 5847724.67763 |
| Thermal Camera & Spotlighting | 454789.06064 | 5844050.49676 |
| Thermal Camera & Spotlighting | 450726.11223 | 5839714.88451 |
| Thermal Camera & Spotlighting | 450209.88705 | 5840742.31704 |
| Thermal Camera & Spotlighting | 449386.67346 | 5841908.09956 |
| Thermal Camera & Spotlighting | 454069.39809 | 5845274.49956 |
| Thermal Camera & Spotlighting | 452946.65271 | 5845889.18753 |
| Thermal Camera & Spotlighting | 451510.01078 | 5847278.20874 |
| Thermal Camera & Spotlighting | 450561.08713 | 5847632.83429 |
| Thermal Camera & Spotlighting | 450917.75463 | 5847866.73082 |
| Thermal Camera & Spotlighting | 451978.82539 | 5846044.59888 |
| Thermal Camera & Spotlighting | 455209.68703 | 5843506.84032 |
| Thermal Camera & Spotlighting | 454803.74636 | 5843006.57325 |
| Thermal Camera & Spotlighting | 455278.90809 | 5842995.87831 |
| Thermal Camera & Spotlighting | 449562.38790 | 5841454.38996 |
| Thermal Camera & Spotlighting | 449042.16631 | 5842111.14808 |
| Thermal Camera & Spotlighting | 451785.09018 | 5837875.28071 |
| Thermal Camera & Spotlighting | 452706.12333 | 5836670.05265 |
| Thermal Camera & Spotlighting | 452499.40957 | 5836080.59657 |
| Thermal Camera & Spotlighting | 455299.70286 | 5841205.60918 |
| Thermal Camera & Spotlighting | 454097.96369 | 5840053.05171 |
| Thermal Camera & Spotlighting | 454644.66518 | 5840273.66199 |

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| Thermal Camera & Spotlighting | 450954.14946 | 5839101.94985 |
| Thermal Camera & Spotlighting | 457475.47019 | 5840614.45714 |
| Thermal Camera & Spotlighting | 458060.24263 | 5840417.77315 |
| Thermal Camera & Spotlighting | 458687.63722 | 5839925.33105 |
