# Supporting the Recovery of the Leadbeater’s Possum

## Progress Report December 2016

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## Ministerial Foreword

The Victorian Government has a long history of protecting and enhancing our natural environment and is continuing its commitment to supporting the recovery of the Leadbeater’s Possum.

With intense bushfires over the years, the co-habitation of industry and fauna, and visible impacts of climate change on our ecosystems, we are facing a complex set of challenges, and we recognise that these challenges require immediate action and a long-term commitment to develop effective solutions.

Bushfire remains the major threat to the survival of the Leadbeater’s Possum. The Victorian Government is assessing the risk from bushfire to Leadbeater’s Possum colonies while feeding new colony records into strategic and operational bushfire management planning. This allows us to develop specifically tailored fire operations plans to protect Leadbeater’s Possum habitat and colonies.

The Victorian Government has also pledged its support for continued implementation of the Leadbeater’s Possum Advisory Group (LPAG) recommendations, which are helping to provide security for Leadbeater’s Possum colonies while also offering clarity and certainty for the native timber industry that operates within the Central Highlands.

All 13 of the LPAG recommendations are being implemented and we have introduced further measures to accelerate the identification and protection of new Leadbeater’s Possum colonies and habitat.

This includes actively locating possum colonies, the protection of colonies with a 200 metre radius buffer zone, delay of timber harvesting where possums are likely to be located, and the introduction of Regrowth Retention Harvesting instead of traditional clearfell methods within the possum’s habitat range.

Since the start of the program nearly two years ago, 270 new Leadbeater’s Possum colonies have been detected in the state forests of Victoria’s Central Highlands, a significant milestone for the recovery program. Many of these colonies were detected by targeted surveys undertaken by DELWP’s Arthur Rylah Institute using infrared cameras installed high in trees.

Records have also come from surveys by VicForests, Zoos Victoria and Parks Victoria and, importantly, many records were received from volunteers within the Victorian community.

The Central Highlands landscape that provides potential habitat for the Leadbeater’s Possum also provides significant resources for our state’s native timber industry. The Victorian Government facilitated the establishment of a Forest Industry Taskforce last year. The Taskforce is working consistently to provide independent advice and leadership, with the aim of reaching common ground on issues facing the timber industry, job protection, economic activity and the protection of threatened species, such as the Leadbeater’s Possum. The Taskforce will bring a consensus, best practice approach to address future issues facing the forestry industry.

The Leadbeater’s Possum recovery program relies on investment and collaboration across government, industry and the wider Victorian community. Our policy experts, scientists and local communities are delivering critical information to help us make the right decisions to improve the conservation of Victoria’s faunal emblem. We will continue the work together to identify and protect Leadbeater’s Possum colonies and their habitat for generations to come.

The Hon. Lily D’Ambrosio

Minister for Energy, Environment
and Climate Change

The Hon. Jaala Pulford

Minister for Agriculture and Minister for Regional Development

## Introduction

The Leadbeater’s Possum is a small arboreal species living almost exclusively in Victoria’s Central Highlands, from Toolangi in the west to Woods Point in the east, south to the Baw Baw plateau and Powelltown.

The Leadbeater’s Possum is listed as a threatened species under Victoria’s Flora and Fauna Guarantee Act 1988, and was elevated to ‘critically endangered’ by the Federal Government in 2015. The species is also Victoria’s State faunal emblem.

The Victorian Government continues to implement all 13 recommendations made by the Leadbeater’s Possum Advisory Group (LPAG) in 2014 to support the recovery of the species while maintaining a sustainable timber industry.

A cross-agency implementation committee is delivering the suite of actions, with representatives from the Department of Environment, Land, Water and Planning (DELWP), VicForests, Zoos Victoria, Parks Victoria, the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) and the Department of Treasury and Finance (DTF).

This report outlines key achievements since publication of the previous Report on Progress October 2015, including implementation of the LPAG recommendations, additional measures introduced in April 2015, and other key actions to protect the small lowland population in the Yellingbo Nature Conservation Reserve.

The government has brought together representatives from key stakeholders across the forest industry, the union movement and forest conservation groups to form the Forest Industry Taskforce. The Forest Industry Taskforce is working to develop a consensus approach to reach common ground on issues facing the timber industry, job protection, economic activity, and the protection of our unique native flora and fauna and threatened species such as the Leadbeater’s Possum.

A collaborative approach between government and the community has been adopted to implement tangible actions that focus on supporting the species now and into the future.

## Finding and protecting Leadbeater’s Possum

Leadbeater’s Possums are communal animals living in small colonies of up to twelve, but typically two to four animals.

As at 30 September 2016, 354 new Leadbeater’s Possum colonies have been located since the program commenced in July 2014, consisting of:

270 colonies in State forest:

* 158 found through DELWP surveys
* 21 found through VicForests pre-harvest surveys
* 79 from reports by members of the community in State forest
* 12 through Project Possum, a partnership between Parks Victoria, Zoos Victoria and the Friends of Leadbeater’s Possum.

84 colonies in national parks and reserves:

* 1 from a report by a member of the community
* 83 through Project Possum.

All new colonies located in State forest were immediately protected by a 200 metre radius (12.6 hectare) timber harvesting exclusion zone, resulting in an additional 2,983 hectares reserved to protect Leadbeater’s Possums.

496 nest boxes have been installed and are being monitored in the Central Highlands, with signs of occupancy found in approximately 53 percent.

72 artificial tree hollows have been created to trial the feasibility of artificial nesting hollows, with signs of occupancy found in 37 (52 percent).

### 200 new colonies

In June 2016 the Victorian Government’s effort to protect the threatened Leadbeater’s Possum reached a milestone with 200 new colonies detected in the State forests of the Central Highlands since the start of the program in 2014. The new colonies were found through DELWP’s targeted surveys, VicForests’ pre-harvest surveys, and reports submitted by Parks Victoria, Zoos Victoria and the community. Some of these new colonies are within the vicinity of earlier Leadbeater’s Possums records, but are at least 200 m from previously known colonies, while others are in areas with no recent records. Since July 2016, there have been a further 70 records from the community.

Special Protection Zones are currently in place for all newly verified colonies found in State forest, as well as colonies recorded within the past 15 years (prior to February 2014). New colonies will continue to be protected by the existing regulations, specifically under the Conservation, Forests and Lands Act 1987, Code of Practice for Timber Production 2014, Appendix 5: Planning standards for timber harvesting in Victoria’s State forests (p39) http://www.delwp.vic.gov.au/parks-forests-and-crown-land/timber-harvesting.

A review of the effectiveness of establishing timber harvesting exclusion zones around all new colonies was scheduled to commence after two years of surveying, or once 200 new colonies with timber harvesting exclusion zones are established. Both these milestones have now been met and the review is being implemented following key input into the design from DELWP and VicForests.

### Targeted surveys

Scientists from DELWP’s Arthur Rylah Institute have been successfully recording Leadbeater’s Possums by working with specialist arborists to install heat-and-motion sensing infrared cameras high in trees.

Targeted surveys conducted between September 2015 and April 2016 at 176 specifically selected sites within State forest in the Central Highlands have revealed an additional 98 new Leadbeater’s Possum colonies, a 56% detection rate. The number of new colonies located this year was greater than in the previous year (50 new colonies located in 2014/15 from targeted surveys at 113 carefully selected sites, a 44% detection rate). Over the two years of targeted surveys a total of 148 new colonies have been located, all of which are now surrounded by 200 metre radius timber harvesting exclusion zones. A further 10 records were obtained from other DELWP surveys during these two years.

The success of these surveys has been bolstered by setting the cameras within the vegetation layers that the possums are most likely to be moving or foraging, up to 40 metres above the ground. The sites were selected to target areas considered most likely to contain Leadbeater’s Possum, which included using sophisticated predictive modelling.

The greater detection rate in 2015-16 compared to 2014-15 (56% vs 44%) is in part due to increasing the number of heat-and-motion infrared cameras at each site from two to three. In addition, many sites were selected close to existing records, which increases the likelihood that the species will be present. This develops clusters of records and their associated exclusion zones thereby increasing the longer term viability of the species in these areas.

Leadbeater’s Possums were recorded in all forest age classes that were sampled, including 1939 regrowth, timber harvesting regrowth and regrowth from the 1983 fires.

Detailed habitat assessments have been undertaken at 289 sampling sites, recording key habitat features such as the number and type of hollow-bearing trees and the density of the mid-storey layer. This information will be used to investigate which are the most important habitat features influencing where the species occurs, and to predict across the species range where they are most likely to be found.

A detailed report on the findings from the second year of surveys will be released early in 2017. A report on the first year of targeted surveys (October 2015) is available on DELWP’s Leadbeater’s Possum web page at: www.delwp.vic.gov.au/leadbeaters.

### Pre-harvest surveys

VicForests has commenced a program of pre-harvest surveys using heat-and-motion detection infrared cameras to look for Leadbeater’s Possum colonies in targeted high priority areas planned for timber harvesting.

These surveys have been designed to reduce the potential risk of harvesting an area that may be occupied by a Leadbeater’s Possum colony and to complement existing measures in place to protect the species habitat.

Since early 2016, 19 areas planned for harvest (coupes) have been surveyed for the presence of
the species, with 21 new Leadbeater’s Possum colonies detected.

Coupes planned for harvest that are most likely to provide habitat for Leadbeater’s Possum are selected for pre-harvest survey based on criteria such as:

* proximity of known Leadbeater’s Possum colonies to a planned coupe
* proximity of planned coupes to known hotspots of Leadbeater’s Possum colonies, and
* presence of high quality Leadbeater’s Possum habitat within or adjacent to the coupe.

The specific survey site location within the selected coupe is then determined by ecological consultants who select the areas expected to have the highest probability of containing Leadbeater’s Possum.

Where pre-harvest surveys find a new Leadbeater’s Possum colony, a 200 metre radius (12.6 hectare) timber harvest exclusion zone is created to protect the colony from any operational activities associated with timber harvesting.

A colony sighting is not the only management approach for the protection of Leadbeater’s Possum at the coupe level. In addition to pre-harvest surveys using infrared cameras, every coupe is also visually surveyed on the ground prior to timber harvesting. If an area meets specific criteria for high-quality Leadbeater’s Possum habitat, as outlined in the species’ Action Statement, it is also excluded from timber harvesting.

### Project Possum

Project Possum is a partnership between Parks Victoria, Zoos Victoria and the Friends of Leadbeater’s Possum where members of the community are supporting Leadbeater’s Possum conservation.

Project Possum activity spans sub-alpine woodland and montane ash forest sites across State forest and national parks in the Central Highlands. Dedicated volunteers are monitoring nest boxes and transporting new nest boxes to strategic locations throughout the Leadbeater’s Possum range. The nest boxes, made from long-lasting recycled plastic, support existing colonies in areas of declining natural hollows.

During the past 12 months, an additional 79 nest boxes were installed in high quality habitat on the Toorongo Plateau. This brings the total number of nest boxes to 496 (243 in sub-alpine woodland and 253 in montane ash forest).

Over the same period, 224 nest box inspections and 20 camera trap surveys were completed resulting in 60 new colonies of Leadbeater’s Possum (49 in parks and reserves and 11 in State forest). There were a total of 95 new records, with some colonies detected more than once. Overall, the nest box colonization rate is 76% in sub-alpine woodland (excluding sites that were severely burnt in 2009) and 30% in montane ash forest.

Significantly, the project has now compiled 85 Leadbeater’s Possum records in unburnt sub-alpine woodland on the Baw Baw Plateau, highlighting the significance of this area for the species.

## Involving the community

### Community surveys

Field surveys undertaken by members of the community are finding new colonies for protection, with community surveys discovering 79 of the 270 new colonies within State forest. Thanks to the efforts of the community, these colonies have been successfully verified by DELWP and are now protected by a 200 metre radius (12.6 hectare) timber harvest exclusion zone.

Community members conducting field surveys for the species are guided by the Leadbeater’s Possum survey standard which provides information on survey methods along with the minimum level of evidence (e.g. photos or video footage) required for a submitted report to be verified as a new colony record using desktop analysis, and if this level of evidence is not available what is required to trigger a verification survey. The standard also covers methods for habitat detection reports. Released in April 2015, the survey standard is currently being reviewed by DELWP to assess its effectiveness.

Survey equipment kits made available for loan by DELWP to community groups, researchers, and other stakeholders interested in conducting surveys for Leadbeater’s Possums are now being utilised extensively in the field. This equipment is supporting the community to provide high quality evidence (photos, video footage) to enable their reported sightings to be rapidly verified. The specialist equipment, including thermal cameras, video cameras, infra-red spotlights and global positioning systems (GPS), can assist in the difficult task of locating the small and fast moving possums at night. The three kits are regularly and effectively being used by community groups. Applications for the loan of the survey equipment can be made via the DELWP Leadbeater’s Possum web page at:
www.delwp.vic.gov.au/leadbeaters

### Leadbeater’s Possum Interactive Map

The Leadbeater’s Possum Interactive Map is being regularly updated by DELWP to ensure the public has access to the most up-to-date spatial information. The interactive map is updated with data contributed by DELWP, VicForests, Parks Victoria, Zoos Victoria and the community.

The map provides a visual representation of confirmed colonies and the surrounding timber harvesting exclusion zones, areas where there is a modelled high probability of occupancy by Leadbeater’s Possum, areas where DELWP has undertaken targeted surveys, as well as VicForests Timber Release Plan. The map can also be used to assist in the community in the selection of their survey sites.

The Leadbeater’s Possum Interactive Map can be accessed via DELWP Leadbeater’s Possum web page at: www.delwp.vic.gov.au/leadbeaters.

## Habitat protection and research

### Artificial hollows

Seventy-two artificial hollows have been created for Leadbeater’s Possum at 18 sites (four hollows per site) as part of a collaborative project between Arthur Rylah Institute (DELWP) and VicForests. Leadbeater’s Possums have been found nesting in 37 (52%) of these hollows (at 78% of the sites). The study aims to investigate the feasibility of providing additional habitat for the species, supplementing natural hollows where they are in decline.

The hollows created by specialist arborists have been specifically designed to suit the species by having a small entrance leading to a large internal cavity. The hollows have been monitored three times at four month intervals (over a 1 year period) to assess if Leadbeater’s Possum investigate and then use the new hollows, both via direct inspection for signs of animals or their characteristic nests made from strips of bark, and review of images from infrared cameras set at half of the hollows.

The positive detection rates are encouraging, and monitoring will continue to investigate long-term use across all seasons, minimum suitable tree size, inter-species competition and other factors influencing occupancy. These results will be used to assess the applicability of this method as a potential management tool to supplement habitat in areas where there are a shortage of suitable nesting hollows for the species.

### Regrowth Retention Harvesting

VicForests has adopted Regrowth Retention Harvesting (RRH) as an alternative to traditional clearfell harvesting methods, within the range of the Leadbeater’s Possum.

Regrowth Retention Harvesting retains additional forest with the aim of providing both current and future habitat for the possum by protecting and enhancing mature forest structures and maintaining connectivity.

VicForests is using this alternative method in up to 50% of its operations in Ash forest harvested across the Leadbeater’s Possum’s range, averaged over a three-year period.

There has been much progress in the application of this harvesting approach, with a great deal of planning going into the retention of forest biodiversity values within areas available for timber harvesting. To date, 47 coupes (65% of the total number of coupes harvested) within the range of the species have been harvested using RRH. The rolling average of area harvested using RRH over the 2014/15 and 2015/16 period is currently 54% of the total area harvested within the range of the species.

### Revised regeneration practices

After timber harvesting, leaf and branch debris is removed from the harvested area to create a seed bed on the ground and assist with regrowing the forest. This seed bed is created through either mechanical means, or through undertaking a regeneration burn which more closely replicates the natural regeneration cycle of native forests. These burns are generally completed in autumn when the weather conditions are most suitable.

VicForests is exploring ways to modify high intensity regeneration burns and, where appropriate, replace these with lower intensity burns in areas where there are important retained values requiring protection, including potential habitat for Leadbeater’s Possum.

The increased use of Regrowth Retention Harvesting (RRH) has changed the way regeneration burns are completed on certain sites to protect the forest which has been retained. On these sites, fuels are mechanically removed away from isolated values such as habitat trees or forest edges, before the next step of burning is undertaken, generally by crews
on the ground rather than aerial ignition. The ignition is often staged in such a way that coupes are burnt in sections and over multiple days to allow the protection of upslope values (which have a higher likelihood of being affected by the regeneration burn).

On RRH coupes containing important retained forest values such as Leadbeater’s Possum Zone 1A habitat, regeneration burns are also undertaken in cooler weather conditions. There can also potentially be a need for further mechanical site preparation if these cooler regeneration burns do not achieve their objective of creating a suitable seed bed on
the ground.

The results for the RRH 2016 burning season showed 98% protection of retained forest values with only 5 hectares of retained forest impacted by the regeneration burns. The reduced intensity of burns has however, meant some additional mechanical disturbance was required to create seedbed where the reduced intensity burns were not sufficient for seeds to germinate and establish.

### Aerial surveys

Aerial surveys of the Central Highlands have been undertaken to identify old trees and map potential habitat within the Leadbeater’s Possum range.

The Leadbeater’s Possum is known to prefer large older trees with hollows for nesting and uses understorey vegetation for movement and as a food source. Light Imaging, Detection and Ranging (LiDAR) and infra-red imagery technologies are being used to collect data to map the locations of old trees and the density of the understorey across the full range of the species.

LiDAR is an airborne radar attached to an aircraft which is able to penetrate the forest canopy all the way to the ground. Objects that fall within the radar path bounce a signal back to a receiver on the aircraft. Data from the forest canopy, the ground, and of the forest understorey made up of grass, ferns, shrubs or trees such as wattles and rainforest species have been collected and will be used to make a radar point cloud (point database).

The LiDAR will now be analysed and compared to known trees and vegetation in the forest, allowing the remainder of the forest to be modelled from the known vegetation survey. The modelled tree canopy, structure and understorey from LiDAR and imagery will provide a landscape view of potentially suitable Leadbeater’s Possum habitat to support the further development of habitat models to inform future management planning.

### Fire impacts

Bushfire remains the major threat to the survival of the Leadbeater’s Possum. DELWP is assessing the risk from bushfire to colonies while feeding new Leadbeater’s Possum records into strategic and operational bushfire management planning.

DELWP is working towards specifically tailored fire operations plans to protect Leadbeater’s Possum habitat and colonies. Work has commenced on determining where in the landscape bushfire risk exists for Leadbeater’s Possum populations, including modelled habitat. A pilot is nearing completion for a subset of the population and results have shown that DELWP can reduce risk by over 50% by burning in strategic areas on public and private land. Results from the research are currently being collated into a proposed fire management strategy. Using this method in the future, burns could potentially be tailored to specifically protect the species as currently occurs for values such as life and property.

In the meantime, implementation of the current three year Fire Operations Plan will still provide a small reduction in residual risk levels by the end of 2019 without altering current approaches. A Leadbeater’s Possum habitat risk profile is being used to report how effective the Fire Operations Plans are in reducing risk to Leadbeater’s Possum populations. The risk profile was produced for the Leadbeater’s Possum occupancy and species distribution models using historical (1980-2016) and predicted (2017-2019) data.

## Yellingbo population

### Population monitoring

The last lowland population of Leadbeater’s Possum can be found at the Yellingbo Nature Conservation Reserve. Monitoring of this genetically distinct population is undertaken by Zoos Victoria and Parks Victoria each year which has shown a population decline of 60% over the past decade.

During May and June 2016, the annual monitoring of the Yellingbo Nature Conservation Reserve population of Leadbeater’s Possum was completed by Zoos Victoria and Parks Victoria. Eight family groups were captured and examined. The average size of the family groups (the possums denning together) was 4.1 individuals. The reproductive rate was encouraging, with seven of the eight groups (87%) containing a female that was lactating or carrying pouch young. Twenty-seven percent of the animals were young recruited over the past 12 months. The size of the population has been fairly stable over the past year, but remains at critically low levels, with the total population estimate for 2016 at 44 individuals.

### Captive breeding

The captive population established at Healesville Sanctuary in 2012 aims to provide insurance against the extinction of the last lowland Leadbeater’s Possum population and to provide a source of animals to re-populate restored habitat.

During the June 2016 annual monitoring, one individual (a young adult male) was collected from the wild for the captive-breeding program. The captive population currently contains 15 individuals. While monitoring data indicates that the possums are housed in highly compatible pairs, are maintaining healthy body weights, and display high levels of activity at night, none have commenced breeding and this is proving more challenging
than anticipated.

A major genetic study is about to commence to investigate the extent of genetic decline in the lowland population and management options for genetic rescue.

### Habitat restoration

Greening Australia, Parks Victoria, Melbourne Water, the Friends of Helmeted Honeyeater and Zoos Victoria are working towards restoring suitable habitat conditions in the wild at Yellingbo and new wild sites beyond Yellingbo where captive-bred individuals can be released in the future. The University of Melbourne is leading a research program to investigate habitat restoration strategies in lowland swamp forest. Greening Australia is also leading the development of a
major habitat restoration project for lowland Leadbeater’s Possums and Helmeted Honeyeaters at Haining Park.

As recommended in the Victorian Environmental Assessment Council’s Yellingbo Investigation Final Report, a Yellingbo Conservation Area Coordinating Committee has been established and is meeting monthly to improve coordination and cooperation between land managers and other agencies in the Yellingbo area. A major focus of this committee is the future management of habitat along rivers and creeks that has previously been managed under grazing licences.

The committee includes representatives from Parks Victoria, Melbourne Water, Yarra Ranges and Cardinia Shire Councils, Zoos Victoria, Trust for Nature, Port Phillip and Westernport Catchment Management Authority, the Department of Environment, Land, Water and Planning, and three community representatives.

## Forest Industry Taskforce

The Victorian government has brought together representatives from The Wilderness Society, MyEnvironment, the Victorian National Parks Association, the Australian Conservation Foundation, the Construction, Forestry, Mining and Energy Union (CFMEU), the Victorian Association of Forest Industries and other stakeholders to form the Forest Industry Taskforce.

In a new approach to Victoria’s timber industry and nature conservation, key stakeholders across industry, the union movement and forest conservation groups developed their own terms of reference in order to seek a consensus on proposals to be put forward to government. The taskforce is undertaking a three phase process to develop its recommendations to government – scoping, deliberating and deciding.

The aim is to create and sustain jobs and industry growth, to conserve high value ecological assets, to protect key species such as the Leadbeater’s Possum, and to implement a durable plan for timber supply, for jobs, for nature conservation and for the good stewardship of Victoria’s forests that can be embraced by the Victorian community.

Actions already underway by the Victorian government are using the best available science, and knowledge gained will likely help to inform the Forest Industry Taskforce in its deliberations on the most effective strategies for assisting in the recovery of the species.