

# Forest Protection Survey Program

Survey Guideline - Leadbeater's Possum Thermal  
Imaging (V5.0)



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## Photo credit

Cover photo: Louise Durkin Arthur Rylah Institute for Environmental Research 2018

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# Call Playback and Thermal Imaging for Leadbeater's Possum

## Context

Leadbeater's Possum is a species of high priority for survey. It is listed as Threatened under the Victorian FFG Act (1988) and Critically Endangered under the Commonwealth EPBC Act (1999).

The recommended technique for determining the presence/absence of Leadbeater's Possum is the deployment of automated camera-traps at baited survey stations for four weeks (28 nights). This technique is the most reliable for detecting the species and can be employed throughout the site, but there may be occasions in the program when a quicker assessment of some sites is required for operational reasons. In these circumstances thermal imaging will be used in place of camera trapping. The thermal imaging survey method described here has been designed to maximise detection of the species while undertaking a survey relatively rapidly.

## Objectives

To detect the presence or infer the absence of Leadbeater's Possum within accessible parts of the site, or immediately adjacent to it, when there is insufficient time to employ the recommended camera-trap technique.

To use nocturnal playback and/or vocal imitations of Leadbeater's Possum calls to draw individuals in for detection via thermal imaging camera and identification via conventional spotlight.

## Survey Effort

This technique is mostly used along roads and tracks due to greater visibility and because of the difficulty in safely walking through ash forest at night. Therefore, it is not always possible to survey all parts of the site using this technique.

Each track or road surveyed, or off-track route within a site surveyed, shall be considered an individual transect. Off-track transects may only be undertaken where access through the forest is reasonable and the route can be flagged in during the day and then returned to for survey at night. Surveys at each site shall consist of a minimum of two hours per site surveying the best available LBP habitat. Depending on access, there may be more than one transect per site. All accessible parts of the site will be surveyed - i.e. walk the length of all roads or tracks available. Surveyors will be responsible for determining how much time is spent on each transect and this will depend on the length of road or track surveyed, and the availability of suitable habitat.

Time spent attempting to confirm the identity of individual animals should be considered additional to the two hours minimum survey effort, given the often difficult and time-consuming nature of identifying Leadbeater's Possum in the field.

Survey distance will vary according to access conditions and is likely to be greater along tracks than through the bush.

Along tracks, surveyors should aim to cover as much distance as can be surveyed thoroughly within the two-hour time period. If there are more tracks than may be surveyed in a two-hour time period, then the surveyor is to conduct a longer survey to ensure all available and accessible habitat is adequately surveyed. Walk very slowly along the track, conducting imitation calls, and continually scanning using the thermal camera. Pause to spend more time searching where there are dense patches of understorey. Walking pace is typically a bit slower than a standard spotlight survey walking pace.

When walking off track rather than walking continually, walk to a point, stop and thoroughly search the area before walking to the next sampling point approximately 20-40 m away (depending on vegetation structure and terrain).

To maximise the sampling effort, spread out the sampling points if animals are being regularly detected. If animals are not detected, keep sampling continually along the survey transect when on track, and at regular intervals if off track.

Each survey transect is to be visited twice on different nights, i.e. one repeat visit of each transect. If Leadbeater's Possums are detected along part of the transect on the first night, this section (i.e. 200 m either side of the detection point) does not need to be re-sampled on the subsequent visit.

Surveyors are required, where possible, to take photographs, georeferenced where possible, of fauna observations and submit this data with other survey results.

## Surveyor requirements

A survey team of at least two people.

Be able to visually and audibly detect and recognise Leadbeater's Possum at night. At least one team member needs to be experienced, or at least well-trained, in the use of thermal imaging cameras, being familiar with the appropriate settings to use based on the conditions on the night. Be capable of vocally mimicking Leadbeater's Possum calls for use in the field.

## Equipment list

- |  |   |
|--|---|
| <input type="checkbox"/> Thermal imaging camera/scope with inbuilt red laser pointer                   | <input type="checkbox"/> Binoculars   |
| <input type="checkbox"/> White-light (plus optional red-light) spotlight or high-power headlamp        | <input type="checkbox"/> Appropriate batteries for all equipment  |
| <input type="checkbox"/> Call playback equipment with speaker/megaphone                                | <input type="checkbox"/> Digital or other camera (with carry case, spare batteries, spare storage card) capable of including georeferencing data with each photo. |
| <input type="checkbox"/> Audio-recording of Leadbeater's Possum alarm calls (and Southern Boobook Owl) | <input type="checkbox"/> LBP Thermal Imaging Survey Datasheet/form  |
| <input type="checkbox"/> GPS   | <input type="checkbox"/> Back-up hard copies of datasheets/forms on waterproof paper on clipboards  |

## Site preparation

The survey location may be pre-determined by the surveyor (e.g. via desktop assessment) and must be within the site or up to 100m of the site boundary. Further assessment will be undertaken on site once accessibility is determined.

Any available pre-existing tracks through or bordering the site should be taken advantage of for surveys.

If the transect is located away from tracks, then the route must be planned and identified during daylight hours, recorded as a GPS track log and marked with reflective flagging tape at sufficient intervals to ensure safe passage at night.

## Conducting the survey

Surveys can be conducted all year round, subject to seasonal access and weather conditions.

Surveys are best conducted when there is no, or little, wind. Nights with strong winds should be avoided as this can significantly reduce detectability.

Sampling can commence any time after dusk (i.e. approximately 30 mins after sunset) and can continue throughout the night.

Upon approach and arrival at the survey site, confirm it as being possible suitable Leadbeater's Possum habitat (e.g. not recently disturbed by fire).

Ensure the required fields are completed on the datasheet/form. This includes measures of wind strength and night-light, and the model of thermal camera employed. The Start time should be entered last.

Surveyors are required to record a GPS track log of the survey effort from the start to the end of each transect at each site. The track log for each transect on each survey night is to be converted to a GIS shapefile and submitted with the shapefile attributes as outlined in the shapefile template provided.

Adjust the settings on the thermal camera to enable a clear differentiation between the background vegetation and an animal. Depending on how the temperature changes throughout the night these settings may need to be adjusted as the temperature decreases.

Commence imitating the calls of Leadbeater's Possum if the observer is experienced in this technique. If not, or if no animals have been detected using the voice imitation, commence playing a pre-recorded sequence of calls including the listening periods. A recommended sequence of pre-recorded Leadbeater's Possum and owl calls is provided in Appendix 1. All pre-recorded calls should be played at 110% of natural volume.

While imitating or playing the recorded calls, one observer should commence using the thermal imaging camera to constantly scan either side of the transect for heat signatures that may be a Leadbeater's Possum. Walk slowly along the transect, with no lights used, pausing as necessary to ensure that the vegetation is thoroughly scanned. The second observer stays nearby, in readiness to use the spotlight if an animal is seen. The white light should only be used to identify an animal that has been detected while using the thermal camera.

Stop the playback if any Leadbeater's Possums are seen or heard.

Individuals may be coaxed closer for identification by continuing to imitate Leadbeater's Possum calls.

Once an animal is located the thermal camera operator should indicate the location by activating the laser pointer immediately below the animal. Take care to avoid shining the laser directly at the animal.

The second observer, guided by the laser pointer, should use a spotlight and binoculars to identify the animal. Although a white light may 'spook' the animal more than a red light, it is usually quicker and easier to get a species identification using the white light, so this is preferred.

Record details of all Leadbeater's Possums and any other arboreal mammals or owls detected on the datasheet/form. Record the location of each detected animal in the GPS.

If identification of any animal takes more than a few minutes, then this should not be included in the total survey location survey duration. Keep track of approximately how long an identification takes and add this to the expected finish time. It can often take a considerable length of time to get a sufficiently clear look at an animal once it has been detected with the thermal camera to confirm its identification. If the observers think a detection is potentially a Leadbeater's Possum, continue searching until it is confirmed, or the animal can no longer be found.

If time and conditions permit, take high quality photos (or video) of each Leadbeater's Possum observation, and observations of other target species.

At the end of the survey location ensure the end time of the survey is recorded and complete any other details required in the datasheet/form.

The date of a survey shall be recorded as the date the survey started.

If a spotlight survey starts before midnight and finishes after midnight, the date of observation to be recorded in the datasheet/form shall always be the date the observation is recorded.

Each spotlight survey will be allocated a unique survey number in the datasheet. This will ensure any observations per day are counted and reported together and not spread over two days (which may result in a trigger not being met).

## Data and reporting requirements

Data requirements are outlined throughout this guideline and in the datasheet/form. Complete all required fields on the datasheet/form for each target observation.

- Record a GPS track log for each transect on each site and submit as a transect shapefile
- Record a GPS track log for each activity setting up a transect within a site and submit as a separate track log shapefile
- All LBP detections require consideration of zoning requirements. Leadbeater's Possum (LBP) thermal imaging detections are to be reported by email to the Contract manager as an interim result as soon as possible, when requested for specific sites.
- If time and conditions permit, take high quality photos (or video) of each Leadbeater's Possum observation, and observations of other target species.
- Note that Feather-tailed gliders are a bit of a unique case and cannot be distinguished to species unless you have an animal in the hand. Therefore, all feather-tailed gliders are to be recorded as *Feather-tailed glider species* VBA code 903793.
- Please enter the survey details (e.g. times and locations of the survey taking place) into the SurveyDetails page. Use the DataFieldsExplained page to help you enter the correct details.
- Ensure the site ID and site name are entered correctly according to the survey package.
- Record easting and northing of each observation in the ObsAttributes page with each observation being entered on a separate row.
- Ensure all mandatory fields are completed and in the correct format, failure to do so will result in submitted data being returned for review.
- A comprehensive list explaining the data entry fields and whether they are mandatory or optional can be found in the DataFieldsExplained page.
- Ensure the CommonName field in ObsAttributes is entered correctly according to the TaxaIDLookup. The spelling of the species common name in the CommonNameField must match spelling in the VBA otherwise the TaxonID column will not be automatically populated.
- **Please Note: Surveyors are expected to submit highest quality data. Please ensure you double check your data entry before submitting data. Submitting incorrect or incomplete information will result in a delay to reporting and may impact on the program outcomes.**

## Appendix 1. Pre-recorded call sequence

### *Call Sequence*

While continually scanning using the thermal imaging camera, play the following sequence at 110% normal volume (use white light only when an animal is detected to confirm identification):

1. Leadbeater's Possum call
2. 2 minute listen
3. Leadbeater's Possum call
4. up to 5 minute listen
5. Southern Boobook Owl call
6. up to 5 minute listen