

Forest Protection Survey Program

Survey Guideline - Leadbeater's Possum Arboreal
Camera Trapping (V5.0)



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Leadbeater's Possum Arboreal Camera Trapping

Context

Leadbeater's Possum (LBP) 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).

LBP surveys are also conducted at selected sites using thermal imaging and spotlighting. These surveys are planned for and conducted separately to the LBP camera trapping surveys.

Objectives

To detect the presence or infer the absence of LBP in, and immediately adjacent to, specified.

To use 'heat-in-motion' sensing cameras with an infrared flash at baited camera trap stations to survey for the target species.

Survey Effort

Surveyors are provided with the detection probabilities of the target species for each survey technique. Surveyors are to target their surveys to those species with the highest detection probabilities in each survey site. The species with higher detection probabilities aid in determining the target species most likely to be detected by the survey technique and will thus inform survey parameters such as preferred habitat for survey, bait type, camera settings, etc.

A 'camera' is a single discrete camera unit.

A 'camera trap' is a camera, set with a bait device to lure animals close in to be photographed.

A 'camera trap site' is a cluster of three camera traps. Individual cameras should be set 50–100 m apart, with no camera within the cluster set more than 200 m from any other camera. In areas of patchy habitats, the distance between cameras within a site can be as close as 35-50m.

Three camera trap sites are to be installed per survey site i.e. nine camera traps in total per survey site. The absolute minimum distance between cameras in different sites must be 200m. Fewer than three sites may be installed when undisturbed parts of surveys sites and adjacent viable LBP habitat are particularly small (e.g. < 20 hectares) and/or where existing LBP timber harvesting exclusion zone buffers overlap a significant part of the survey site. If less than three camera trap sites are installed, please record the reasons why in the comments section of the Datasheet/form.

Camera trap sites are to be placed within survey site boundaries, or immediately adjacent (no further than 100 m outside the survey site boundary) in suitable habitat.

Camera traps are to be left in-situ for at least four weeks / 28 nights.

Surveyors are required to record a track log of the area covered from the start to the end within each survey site when setting up camera trap sites. The track log is to be converted to a GIS shapefile and submitted with the shapefile attributes as outlined in the shapefile template provided.

Surveyor requirements

A field survey team of no less than two teams of two working together at each survey site.

Each team will consist of:

- One qualified and trained arborist / tree climber / tree canopy specialist (hereafter 'arborist') experienced in LBP camera trapping,
- One qualified ecologist experienced in LBP camera trapping.

At least one team member must be capable of determining the possible or probable presence of LBP Zone 1A and 1B habitat (see 'LBP Habitat' section for more information).

Equipment

- Infra-red cameras (or approved alternative). The most commonly used models that provide high detection probabilities for LBPs (> 85%, Nelson et al. 2017) are HC500, HC600 or PC900.
- Bungee cord or similar to attach cameras to trees.
- Bait holders e.g. 2 vent cowls attached to a section of PVC pipe.
- Bait (creamed honey recommended)
- Flagging tape to mark camera and bait trees.
- Attachment devices e.g., saddle clips, cable ties, screws
- Attachment tools e.g., drill
- GPS unit
- Camera survey datasheet/form
- All relevant tree climbing equipment and associated PPE.
- Appropriate spare batteries for all equipment
- Handheld UHF radio for communication between teams
- Digital or other camera (with carry case, spare batteries, spare storage card) capable of including georeferencing data with each photo.

Site selection

Team members are to locate suitable LBP habitat for installing cameras. Desired habitat features include:

- predominance of smooth-barked eucalypts with exfoliating bark (providing shelter for insect prey and nesting material)
- structurally dense and interlocking canopy or secondary tree layer (to facilitate movement)
- *Acacia* spp. present in the understory or mid-storey (providing foraging resource and connectivity for movement)
- Zone 1A and 1B habitat protection triggers (see 'LBP Habitat' below)

If suitable habitat is restricted to only part of the survey site, then cameras may be set up in next best available areas adjacent to suitable habitat to maximise chances of detection. If this is not possible, then fewer than three sites may be established subject to agreement with the Contract Officer.

Camera Trap sites may be established in suitable habitat immediately adjacent to the survey site, but no further than 100 m outside the survey site boundary.

It is not advised to install camera traps on hollow-bearing trees with suspected LBP dens.

The two teams of Arborists and Ecologists are to be in contact at all times via UHF radio. Teams installing different camera trap sites within survey sites can thus ascertain if their chosen camera locations are sufficiently far apart. Use a GPS and UHF radio between proposed camera trap sites to ensure separation of cameras from each other. No camera is to be closer than 200 m to a camera in another camera trap site, or within an existing LBP timber harvesting exclusion zone (refer to spatial layer LBPAG_BUFF_CHRFA, available via www.data.vic.gov.au).

Camera trap sites are to be set up as a cluster of three camera traps - usually set in a variably shaped triangular pattern but can be in a straight or near-straight line targeting linear patches of habitat (e.g. along gullies). Use a GPS to ensure required separation of camera traps within each site i.e. three cameras set 50–100 m apart (other than in areas of poor-quality habitats whereby the distance between clustered cameras may be 35-50m), and no camera within the cluster set more than 200 m from any other camera.

Camera installation

Once the camera trap site locations within a survey site have been identified, proceed to install the three camera traps at a maximum of three per site, in the spatial configuration stated above. A maximum of three sites are to be installed in the best available habitat on any one survey site. Cameras traps are to be set by the Arborist whenever climbing is required, under direction from the Ecologist.

Camera traps are to be installed within structurally well-connected vegetation strata, with no restrictions set on installation height above ground, other than climbing safety considerations. In some forest successional stages this may be very low (2-3 m in understorey shrubs), while in others, the most suitable laterally connected vegetation will be very high above ground (~50 m in Eucalypt canopy).

At each location selected for installation of a camera trap, consideration should be given to the immediate structural environment present in and around images captured by cameras. Baits are to be filled with creamed honey (depending on permit conditions) and securely closed prior to installation in the tree. Cameras and baits are to be set 1.5-3 m apart, either within the same tree or between adjacent trees. Look for bait placement opportunities with branching structures to either side, providing a substrate for animals coming into the bait that intersect with the detection bands of the camera's passive infrared sensor (PIR; see examples for Reconyx below).

It is of paramount importance that the camera is aligned correctly, so that the bait station is precisely at the centre of the frame for a Reconyx camera (other camera brands will have different detection zones so alignment in these cases would be different). Animals should not be able to reach the bait without crossing the detection bands of the camera's PIR sensor.





Images above: Examples of LBP camera alignment with bait stations and the location of the PIR sensor

Ensure the survey siteID, camera siteID and cameraID details are recorded, as per naming protocols, on the camera trap SD card. Use the camera trap SD card in a digital camera to take photos of the digital or hardcopy datasheet/form, ensuring that the survey siteID, camera siteID, cameraID, and date are photographed.

Ensure the camera has correct date and time set.

Standard camera settings to set:

- high sensitivity level for the motion detector
- five pictures per trigger
- no interval between pictures e.g. RapidFire mode
- no delay between successive triggers
- night mode / programmed to turn on 1 hr before sunset and turn off 1 hr after sunrise if the camera model has that capability.

The Arborist should ensure correct camera placement by triggering the camera a few times. Camera placement should be reviewed by removing the SD card (ensure camera is turned off when removing/installing cards) and passing it to the Ecologist to review camera and bait placement images on a digital camera (or similar device for reviewing images) to confirm that the camera is correctly set. The SD card should then be returned to the Arborist with instructions from the Ecologist for resetting the camera position if required. Ensure that the camera has appropriately charged batteries (>90% charge) and is switched on (and the door firmly closed) prior to leaving the camera trap. Minimise any mobile vegetation, particularly foliage, within the frame of the images taken by the camera, to avoid false triggers. Any bark above the camera that might fall down and cause false triggers during the survey period should be removed.

At least six photos of each camera trap installation, preferably georeferenced, are to be taken to show the camera setup, bait station setup, the relationship between the two and the habitat where the trap is setup. Photos may be taken by using the SD card from the camera trap in a digital camera. These images must be submitted along with the camera trap images when submitting the survey and image data.

The Ecologist shall record the bait station location and use flagging tape to mark the camera and bait trees, so they can be easily located upon return to the site.

Upon retrieval of the cameras at the end of the survey period (minimum of four weeks, i.e. 28 nights) ensure that the camera is still operational by capturing and saving an image before retrieving the camera. Record in the comments

field of the datasheet/form if the camera is not working for some reason or if the batteries have gone flat, or if the bait station is missing.

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.

In summary:

- All LBP detections require consideration of zoning requirements. Leadbeater's Possum (LBP) detections are to be reported to the Contract officer as soon as possible, when requested for specific sites.
- Record observation data in the datasheet/form after tagging images using DigiKam in accordance with the camera trap image analysis procedure and
- Record a GPS track log for initial establishment of cameras on site and submit as a track log shapefile.
- Record and submit georeferenced photos.
- 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 is entered correctly according to the survey package and in the format of xxx-xxx-xxxx with no blank spaces.
- Record one record only of the first confirmed observation of each unique species for each camera trap in the ObsAttributes page on a separate row.
- A comprehensive list explaining the data entry fields and whether they are mandatory or optional can be found in the DataFieldsExplained.
- Ensure the CommonName field in ObsAttributes is entered correctly using the exact common names as spelt out in the TaxalDLookup.
- **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.**

LBP Habitat

Where potential Zone 1A or 1B is identified, notify DEECA in datasheet/form when reporting on camera installation. Note that Zone 1A and 1B habitat descriptions are only provided to assist with identifying potential camera site locations. Observers are not required to map the habitat, as mapping extent will be conducted by remote sensing analysis and possibly further targeted field survey.

Zone 1A Habitat

Where there are more than 10 live mature or senescent hollow-bearing trees per 3 ha in patches greater than 3 ha, and each tree is within 100 m of one of the other trees.

In Zone 1A habitat hollow-bearing trees are defined as live mature or senescent trees of Mountain Ash, Alpine Ash or Shining Gum containing hollows. During salvage harvesting after fire, Zone 1A habitat is assessed as if all the trees were live.

Zone 1B Habitat

Where there are more than 12 hollow-bearing trees per 3 ha in patches greater than 10 ha and wattle density exceeds 5 m²/ ha.

In Zone 1B habitat, hollow-bearing trees are dead, mature or senescent living trees of Mountain Ash, Alpine Ash or Shining Gum containing hollows. This prescription applies until either of the Zone 1B attributes (the presence of dead, mature or senescent living trees containing hollows, or wattle understorey) no longer exist.

For more detailed instructions on identifying LBP habitat in field surveys see pages 15 and 16 and Appendices 5 to 8 in DELWP (2015) Threatened Species Survey Standard: LBP. April 2015. Victorian Government.

https://www.wildlife.vic.gov.au/_data/assets/pdf_file/0030/27894/LBP-Survey-Standard-2015-artwork.pdf