Forest Protection Survey Program

Survey Guideline - Terrestrial Camera Trapping (V4.1)

VICTORIA State Government | Environment, Land, Water and Planning

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Context

The high priority species for terrestrial mammal camera trapping are the Spotted-tailed Quoll, Long-footed Potoroo, and Smoky Mouse

The Common Dunnart and the White-footed Dunnart are considered medium priority species for targeting in the FPSP. Detection of the Common Dunnart triggers harvesting prescriptions in the Central Highlands only. There are no prescriptions for the White-footed Dunnart in the program area.

Other threatened terrestrial mammal species of medium to high priority in the FPSP which may be camera trapped are the Brush-tailed Phascogale, Long-nosed Potoroo, Southern Brown Bandicoot, New Holland Mouse, Broad-toothed Rat, and Swamp Antechinus.

Many other species e.g. Dingo, cat, fox etc may also be observed by terrestrial camera trapping and while not the target of this survey method, these observations are to be reported.

Some of the threatened small mammals detected via camera trapping may not be identifiable to species level. This can be due to a paucity of suitable close-up high-quality images or because some small species can never be identified by camera trap images alone. For example, Common Dunnarts and White-footed Dunnarts can only be distinguished from each other by close physical examination in-hand. Where identification of Dunnarts from photos is uncertain, the contractor is to record the observation as an interim observation and to record the identification as “Unidentified Sminthopsis” VBA TaxonID 11800. The contractor is to seek expert taxonomic advice to interpret the photos.

Where small mammals are detected and identification is uncertain (interim), the surveyor will advise the FPSP. FPSP will then determine whether the site will require cage or Elliott trapping to confirm the presence of these species.

Objectives

To detect high priority threatened terrestrial mammals using camera traps within, and immediately adjacent to, certain coupes in the FPSP.

To use camera traps to detect high priority small mammals. This may trigger the application of other techniques e.g. Elliott trapping, to confirm the identification of species that can’t be identified to species level by images alone (e.g. Dunnart sp.).

Survey effort

For all species other than Spotted-tailed Quolls a ‘site’ consists of two camera traps with up to two sites per coupe depending on coupe size.

Fewer than two sites may be installed when unharvested parts of coupes and adjacent viable habitat are particularly small (e.g. < 20 hectares) and/or where existing special protection zones overlap a significant part of the coupe.

Camera sites are to be placed within coupe boundaries, or immediately adjacent (no further than 50 m outside the coupe boundary) in suitable habitat.

No camera traps are to be placed within already established SPZs.

Cameras are to be left in place for up to four weeks/28 nights depending on the target species.

The total number of camera traps deployed per coupe will vary according to the size of the coupe and species being targeted.

Three different types of camera trap stations may be constructed, targeting Spotted-tailed Quolls or Long-footed Potoroo and other medium-sized mammals, or Smoky Mouse and other threatened small mammals.

Contractors are provided with the detection probabilities of the target species for each survey technique. Contractors are to target their surveys to those species with the highest detection probabilities in each coupe. 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.

Two different types of bait attractant may be used depending on the target species:

- carnivore bait (to attract quolls) consisting of sardines, chicken pieces with fish oil

- standard mammal bait (to attract herbivores / omnivores / mycophagus mammals) consisting of a mix of peanut butter, rolled oats, golden syrup and truffle oil or pistachio essence (for mycophages).

Cameras will be set to take still images (not video).

Carnivore (predator) and standard mammal herbivore (prey) camera trap stations must be separated spatially by at least 500 m. Carnivore and herbivore surveys will not be combined within one survey effort. Carnivore and herbivore camera trapping will only be conducted as separate survey efforts, to protect prey species.

At least two visits will be made to each coupe (to deploy and then retrieve cameras) and up to four visits shall be expected if quoll camera sites are within 500 m of other camera sites and therefore require a separate deployment.

Contractors are required to record a track log of the area covered from the start to the end within each coupe when setting up cameras. The track log is to be converted to a GIS shapefile and submitted with the shapefile attributes as outlined in the FPSP Standard Operating Procedure (note a shapefile template is provided by FPSP).

Staff requirements

A field survey team of at least two people.

At least one team member experienced in the use of automated 'trail' cameras as baited camera traps in wildlife surveys.

Sound, practical knowledge and experience in all aspects of the particular models of survey cameras being deployed.

Understanding of the practical limitations in using camera traps (that are primarily designed to photograph large game animals moving on trails at a distance) for wildlife surveys (detecting small to medium sized animals at small bait stations at close range). It is especially critical that staff understand the shape and spread-angle of the sensor's detection zone for each model of camera used, in order to aim it correctly.

Attention to detail to ensure that survey cameras are correctly set-up, both in terms of correct internal settings and external physical positioning.

Staff may have to buy materials and construct their own bait holder devices.

Be able to recognise potential habitat for the primary target species (i.e. Spotted-tailed Quoll, Long-footed Potoroo, Smoky Mouse and dunnarts) habitat.

Equipment for the technique

- ☐ Digital or other Camera (with carry case, spare batteries, spare storage card) capable of including georeferencing data with each photo
- ☐ Infra-red cameras
- ☐ White flash cameras
- ☐ Batteries (that can perform for 3-4 weeks)
- ☐ Memory cards
- ☐ Card viewer or digital camera (if no inbuilt viewing screen on survey cameras)
- ☐ Bungee cord or similar (to attach cameras to trees)
- ☐ Cable-locks (or similar locking device if desired)
- ☐ Elevated bait holder devices, well aerated (e.g. small custom cages, modified cutlery drainers, PVC pipes with holes, insect/water proof pipe vents, etc) (devices are NOT to be pegged to the ground)
- ☐ Rain covers (for bait holders e.g. stiff plastic, stainless steel termite shields)
- ☐ Poles/stakes/fence droppers (as necessary to elevate cameras and bait holders)
- ☐ Block hammer / steel mallet (to drive in posts/stakes)
- ☐ Bait - carnivore and/or herbivore/mycophagus bait
- ☐ Attachment devices for bait holders (e.g. wire)
- ☐ Attachment tools (e.g. pliers)
- ☐ Camera alignment devices (e.g. plastic/timber wedges, custom mounts)
- ☐ 5 m tape measure
- ☐ Vegetation clearing equipment (e.g. secateurs, pruning shears)
- ☐ Small white board and marker / clipboard (with blank paper and texta)
- ☐ 2x GPS
- ☐ 2x hand-held compasses
- ☐ Appropriate spare batteries for all equipment

☐ 2x FPSP Camera Trapping Datasheet/forms on 2x electronic-based pro-formas

☐ Back-up hard copies of datasheet/forms on waterproof paper on clipboards x2

Site Preparation

The general location of the survey sites may be pre-determined (e.g. via desktop assessment or CHASS). Contractors are responsible for selecting camera trap sites based on identifying the best available habitat on the coupe for the target species.

Conducting the survey

All camera surveys:

Cameras are to be installed and setup in accordance with the manufacturer's guidelines and the specific directions in the FPSP survey guidelines.

Ensure that the camera has the correct date and time set.

Use advanced camera settings where possible e.g. high image resolution, multiple pictures per trigger, minimum delay between triggers (without unduly compromising battery life and the unit's ability to function normally for the required survey period).

Ensure that the camera is coded with coupe, site and camera details (e.g. save the first camera photo of small white-board or similar showing coupe number/name, site number and camera number within site).

All cameras are to be set in horizontal orientation facing across the ground (i.e. not set vertically / directly facing the ground).

All bait-holders must be elevated to a height to suit the target species (see detail below).

Ideally face the camera approximately south to avoid the rising or setting sun flaring in the lens.

Using the camera's walk test mode, ensure that the camera detects movement either side and in front of the bait station.

Check that the camera is aimed and aligned correctly with the bait station by viewing test images (e.g. using an external image viewer, digital camera). Centre the sensor's detection zone on the base of the bait pole/tree. This may or may not correspond to the centre of the picture frame depending on the model of camera used. The worker must be familiar with this and adjust the alignment accordingly.

Ensure at least 1 m of ground is visible in the test image between the camera and bait so that animals close to the camera are captured. Adjust the height or angle of the camera accordingly.

Remove any vegetation in and around the camera station which may heat up and move in the wind causing the camera to trigger (i.e. false trigger).

Ensure the ground between the camera and bait station is reasonably homogenous to prevent differential heating of some objects (e.g. large rocks vs leaf litter) which could falsely trigger the camera via air movement across the object.

It is advised that camera units be locked against theft.

Record the camera trap's location and mark the site with flagging tape (this may not be advisable in areas where theft is likely be an issue).

At least six photos of each camera trap 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 separate digital camera). These may then be submitted along with the camera trap images when submitting the survey data.

On retrieval of the camera at the end of the survey, approach the camera from the front to trigger the camera so that a time and date-stamped image is saved to determine whether the camera has remained operational for the survey duration. This indicates the end of the sampling period when analysing the camera photos back at the office.

If no more camera surveys are to be conducted at the site, then remove all flagging tape.

Camera traps for Spot-tailed Quolls:

Survey from May – August (avoid Spring and early Summer)

2 camera traps per coupe, traps set 300–500 m apart for 28 days. For coupes less than 20 ha, use 1 camera trap.

Cameras with infrared flash are recommended but white flash units can also be used.

Standard camera settings:

- Motion sensor On
- Sensitivity High
- 5 pictures per trigger
- No delay between photos e.g. Rapidfire
- Quiet period – No delay (i.e. no delay between successive triggers)

Ensure that the camera is in 24 hr mode (as quolls can be active both day and night).

Bait holder ~ 1 m above the ground, camera sensor ~ 0.5 m above the ground (knee height).

3–4 m between the camera and bait station.

Use a GPS to ensure separation of quoll camera traps from each other i.e. trap stations 300–500 m apart (and 500 m from any other camera trap targeting other species at the same time).

The bait shall be a large fist-sized mass (e.g. chicken drumstick, 2 x opened tins of sardines) inside a well-ventilated holder, preferably protected from the rain.

Pour a small amount of fish oil down the bait tree/pole/stake and around its base to encourage an animal to linger.

Camera traps for medium-sized mammals:

Detection and identification of Long-footed Potoroo, Long-nosed Potoroo, Southern Brown Bandicoot, Brush-tailed Phascogale and other medium sized mammals

Can conduct surveys at any time of the year (but Autumn is optimal)

Two camera traps per site, traps set approximately 100 m apart within a site in suitable habitat for 21 days, up to a maximum of two sites per coupe

Cameras with infrared flash are recommended but white flash units can also be used.

Standard camera settings:

- Motion sensor On
- Sensitivity High
- 5 pictures per trigger
- No delay between photos e.g. Rapidfire
- Quiet period – No delay (i.e. no delay between successive triggers)

Ensure that the camera is in 24 hr mode (Southern Brown Bandicoots can be active both day and night)

Bait holder ~ 30 cm above the ground, camera sensor ~ 0.5 m above ground (knee height)

3 m between the camera and bait station

Use a GPS to ensure separation of approximately 100 m between camera traps.

Use a standard mammal bait (peanut butter, rolled oats, golden syrup) that includes a small amount of truffle oil or pistachio essence with a partially fluid ‘runny’ consistency to hinder desiccation and loss of smell over time.

If tea infusers are used as bait holders (6-8 are recommended) they must be contained within a cage device (as some animals can open them and remove the bait). The ideal tea infusers are perforated, stainless steel, double-spoon type.

Camera traps for small mammals:

If specifically targeting Smoky Mouse, White-footed Dunnarts, Common Dunnarts, New Holland Mouse

Can conduct surveys any time of the year (late-Summer is probably optimal for Smoky Mouse)

2 camera traps per site, cameras approximately 100 m apart in suitable habitat for 21 days, up to a maximum of 2 sites per coupe

Standard camera settings:

- Cameras with white flash only
- Motion sensor On
- Sensitivity High
- 5 pictures per trigger

- No delay between photos e.g. Rapidfire
- Quiet period – No delay (i.e. no delay between successive triggers)

Bait holder ~ 20 cm above the ground (encourages small mammal to climb onto, or reach up for, the bait holder and thus reveal diagnostic identification features such as tail/body length), camera sensor ~ 30 cm above ground (shin height)

1.5–2.0 m between the camera and bait

NOTE: The brightness of the white flash can vary between camera models. Because the camera is set close to the bait holder it will be necessary to test the white flash brightness in advance for potential overexposure at close range and reduce intensity if necessary (e.g. via settings, tape over the illuminator, etc).

NOTE: The choice of camera model and the correct aiming of the unit is critical when targeting small animals at close range.

Ensure that the camera trap station is clear of all vegetation, rocks etc down to 2-3cm above the ground (particularly near the bait holder) to prevent any small animals being obscured from the camera.

As the camera is set low to the ground ensure that the sensor has a clear view straight to the base of the bait pole (i.e. that the detection zone is not blocked by a rise/bulge in the ground between the sensor and the bait pole).

Use a GPS to ensure separation of 100 – 120 m between camera traps.

Use a standard mammal bait (peanut butter, rolled oats, golden syrup) with a partially fluid ‘runny’ consistency to hinder desiccation and loss of smell over time.

If tea infusers are used as bait holders (6-8 are recommended) they must be contained within a cage device (as some animals can open them and remove the bait). The ideal tea infusers are perforated, stainless steel, double-spoon type.

If Smoky Mouse is detected in a camera trap using Infra-red flash, contractors are required to seek confirmation of the identification from ARI staff. Contact details are available on request from fpsp.inquiries@delwp.vic.gov.au.

Data reporting requirements

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

- 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 coupe 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 coupe 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 last 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 TaxaIDLookup.
- Where identification of Dunnarts from photos is uncertain, the contractor is to record the observation as an interim observation and to record the identification as “Unidentified Sminthopsis” VBA TaxonID 11800.
- **Please Note: As per the standard operating procedure, contractors 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.**