UniSQ AEC Standard Operating Procedure

The use of camera traps

UniSQ AEC SOP ID: WL020

This Standard Operating Procedure (SOP) is applicable to all UniSQ Research Workers who care for and use Animals for Scientific Purposes. The procedure must only be performed by those persons who have been deemed competent, and who believe they remain competent to do so. Access to supervision by suitably qualified staff whilst undertaking this procedure is encouraged, where required.

Species

- Various mammal species
- Various reptile species
- Various bird species
- Various amphibian species

Purpose

The purpose of this SOP is to describe the use of camera traps for wildlife surveys. Camera traps are an increasingly popular method to monitor wildlife around the world (Rovero et al. 2013; Blount et al. 2021). The use of camera traps is relatively non-invasive, and doesn't require any animal handling or personnel to be present (Davis 2011; Blount et al. 2021). Additionally, camera traps can be less time consuming than other methods such as trapping (Mitchell & Balogh 2007). Camera traps can be left in place for long periods with minimal human input required, which can be useful in remote areas or when restrictions impact research activities, such as COVID-19 lockdowns (Blount et al. 2021).

Data from camera traps can be used to monitor animal behaviour, and estimate population dynamics and abundances using mark-recapture technology (Mitchell & Balogh 2007; Rovero et al. 2013; Diete et al. 2016; Blount et al. 2021), particularly for animals with uniquely identifiable marks or patterns. The use of camera traps can be useful particularly for rare or elusive species, and have been used in determining the expansion of animal distributions (Bista et al. 2021).

There are a number of different brands and types of camera traps available, and the appropriate camera should be chosen dependant on the study aims and capacity. Considerations in regards to camera brands and type include the cost, technical expertise, weather resistance, and monitoring ability (such as battery life etc.) (Davis 2011). The number of camera traps to be used in a study will be dependant on the size of the study area, target species, resources, logistics, and aims of the study (Davis 2011; Rovero et al. 2013). Most camera traps use passive infrared sensors to detect a change in motion and heat, thereby triggering the camera to take a photo or video depending on the settings (Blount et al. 2021). Camera traps may use a white flash or infrared technology to take the photos. Images from white flash cameras tend to be more easily identifiable as they take colour photos, whereas infrared cameras produce black and white images that can be of lesser quality (Diete et al. 2016; Meek & Vernes 2016). However, the impact of the flash type on animal behaviour is something to be considered when deciding which camera type to use. Camera traps can be set passively or actively (i.e. with bait). The use of a peanut butter-based bait is a common universal bait (Diete et al. 2016), although various baits may be used dependant on the target species. Similarly the orientation of the camera may change dependant on the information required and optimisation of detection of species (Meek & Vernes 2016). For example, Diete et al. (2016) found that placing the cameras looking down onto the bait was useful for distinguishing between dorsal pelage patterns of quolls, potentially allowing the identification of individuals.

Definitions	
AEC	Animal Ethics Committee
Camera trap	A wildlife camera designed to trigger in the presence of an animal
Python lock	A cord based lock which acts similar to a bicycle lock, threaded through the back of the camera and around a tree/stake/or similar to reduce the chance of a camera being stolen

Linked SOPs	
SOP ID number	**SOP title**

N/A	

Potential hazard to Research Workers

UniSQ Risk Management Plan ID number	UniSQ Management Plan title
RMP_2020_4960	Wildlife research and teaching fieldwork

Personal Protective equipment required

- Enclosed footwear
- Sunscreen
- Insect repellent
- Sun-appropriate clothing

Animal wellbeing considerations

Perceived stressors	Management strategy
Ingestion of rotting bait	Camera traps are sometimes baited to attract species. There is a potential for bait to rot (dependant on type of bait), and potentially harmful bacteria will replicate. This will be accelerated on hot days and prolonged exposure to the sun. Where possible, a shaded location should be selected for placement of bait. Bait that has the potential to rot should be renewed daily if possible, with the old bait removed, and the area cleaned. Some species are more resistant than others to the risks of rotting bait, but animals will choose to eat bait at the stage of rot that they are capable of consuming. Frequently, animals do not actually have access to the bait, and it is used as a lure rather than being able to be consumed.
Disruption of trophic relations	Providing food to wild animals (via bait) can disrupt local trophic relationships if conducted over a prolonged period and if animals have access to the bait. This can have unknown consequences which could potentially damage the ecosystem.
Awareness of camera traps	Some animals detect camera traps, and make efforts to avoid them which may disrupt behaviours and home ranges if conducted over a prolonged period.

The overall perceived level of risk to an animal undergoing this procedure is:

☐ High ☐ Medium ☒ Low

Substances to be administered

Substance	Dose	Route	Purpose
Not applicable			

Equipment/ materials required

- Camera traps
- Python locks
- Memory cards
- Rechargeable batteries
- Battery chargers
- Star pickets or stakes as required
- Bait as required (dependant on target species)
- GPS and/or flagging tape to mark location of cameras

Site specification or location requirements

At locations/ fields outlined in UniSQ AEC approved application that includes the use of this SOP.

Waste disposal

Not applicable.

Duration of the procedure

- 1-5 minutes per trap to set up, such as adjusting image quality, size, trigger rate, etc.
- 1-5 minutes ti set each camera trap *in situ*
- Reviewing of camera footage depends on the amount of data collected (hours)

Procedure

Preparation

1. Ensure batteries are fully charged and memory cards have enough required space.
2. Go through the camera trap settings and set to desired settings. This could include the date and time (if not already set), whether you require video, still images, or both (dependant on camera and capabilities), the number of images to take per trigger, latency between triggers, and sensitivity of the trigger.
3. If using bait, prepare enough bait for the number of camera traps to be set.
4. It is recommended to visit the site prior to deploying cameras to determine where cameras will be set, and if additional materials such as stakes or star pickets are required to fasted the cameras to. Areas that may yield high results include water sources, holes in fences, animal tracks, or other areas with signs of animal activity.

Setting camera traps

1. Fix the camera trap in place using the straps and python locks as required. Cameras may be fastened to trees, star pickets, stakes, fenceposts, or similar as appropriate (Figure 1). Pay attention to the height of the camera dependant on the target species.
2. Ensure the camera is angled correctly in the required position. A stick or wood block may be placed between the camera and strap to assist.
3. Clear any vegetation or similar from in front of the camera that is likely to impede the view or cause false triggers. Consider the location of any moving shadows that are likely to cause false triggers.
4. Turn the camera trap on and test to make sure it is working by walking in front of the camera at the desired recording distance. Review footage to check the camera has triggered appropriately.
5. If using a bait, place the bait in position, ensuring it is within the detection zone of the camera.
6. Use GPS to mark the location of the camera trap. Where this is not possible use flagging tape.
7. Hold a piece of paper or similar with the site location, date, time, person setting the camera, and camera trap ID in front of the camera momentarily to record this information.

Figure 1: Camera trap placed *in situ* on a tree and secured with a strap.

Training, qualifications or competencies required

Researchers with relevant experience or qualifications can only undertake this SOP to complete the procedures required.
Student researchers must receive appropriate training and supervision from UniSQ research supervisors or qualified individuals prior to undertaking procedures.

References

Bista, D, Lama, ST, Shrestha, J, Rumba, YB, Weerman, H, Thapa, MK, Acharya, H, Sherpa, AP, Hudson, NJ, Baxter, GS, Murray, PJ (2021), 'First record of Bengal Tiger, *Panthera tigris tigris* Linnaeus, 1758 (Felidae) in eastern Nepal', *Check List,* vol. 17, pp. 1749-1253.

Blount, JD, Chynoweth, MW, Green, AM, Sekercioglu, CH (2021), 'Review: COVID-19 highlights the importance of camera traps for wildlife conservation research and management', *Biological Conservation,* vol. 256, 108984.

Davis, MJ (2011), *Standard Operating Procedure: Remote operation of cameras,* Department of Environment and Conservation, version 1.0.

Diete, RL, Meek, PD, Dixon, KM, Dickman, CR, Leung, LKP (2016), 'Best bait for your buck: bait preference for camera trapping north Australian mammals', *Australian Journal of Zoology,* vol. 63, pp. 376-382.

Meek, PD, Vernes, K (2016), 'Can camera trapping be used to accurately survey and monitor the Hastings River mouse (*Pseudomys oralis*)?', *Australian Mammalogy,* vol. 38, pp. 44-51.

Mitchell, B, Balogh, S (2007), *Monitoring techniques for vertebrate pests – Wild Dogs,* NSW Department of Primary Industries, https://pestsmart.org.au/wp-content/uploads/sites/3/2020/06/Monitoring-techniques-for-vertebrate-pests-dogs.pdf.

Rovero, F, Zimmermann, F, Berzi, D, Meek, P (2013), 'Which camera trap type and how many do I need? A review of camera features and study designs for a range of wildlife research applications', *Hystrix Italian Journal of Mammalogy,* vol. 24, pp. 148-156.

Licences and permits

Any required licences and/or permits to undertake this SOP must be obtained before using this SOP.

SOP approval and review history

Date	Version	Review Pathway	Notes
3/11/2021	0.0	**07/10/2021** UniSQ AEC "Subject to Modifications." **03/11/2021** Reviewed and approved by the UniSQ AEC Executive.	N/A
28/11/2023	0.1	**28/11/2023** Converted SOP to new UniSQ branding and revised all reference of 'USQ' to 'UniSQ'	UniSQ Rebrand
15/08/2024	0.2	**15/08/2024** UniSQ AEC reviewed and approved	3 year review