

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

- *Antechinus* species
- *Planigale* species
- *Sminthopsis* species
- *Phascogale* species
- *Isodon* and *Perameles* species
- *Trichosurus* species
- *Pseudocheirus* species
- *Petaurus* species
- *Pseudomys* species
- *Rattus* species
- *Hydromys* species
- *Mus musculus* species
- Other various mammal species

Purpose

The purpose of this SOP is to provide information to the AEC, and people considering use of aluminium box traps or cage traps in surveys and research on small animals, on how to set traps, remove animals from traps, process them, and then release them.

Population surveys and monitoring play a key component to many ecological research projects. Population data is obtained through ecological survey techniques such as camera, cage, Elliott and pitfall trapping. Trapping is an effective method of obtaining species diversity and abundance data, calculated from the number of species (and individuals in each species) caught over a set trapping period. This data becomes the foundation for conservation project development, aids in the understanding of wildlife ecology and improving current research practices. Typically, you decide the length of time that trapping will take place prior to the start of trapping which can be as short as two days or extend to weeks. Depending on environmental conditions (typically rainfall and temperature) trapping capture rates can be 0% (no animals caught; typically in prolonged dry and cold conditions) or infrequently over 100% (e.g. over 100 animals caught per 100 traps in each day of trapping; this can occur on warm nights in spring/summer after regular rainfall for several years).

Aluminium box traps (e.g. Elliott traps by Elliott Scientific Company, Upwey, Victoria although other companies now make similar box traps; in America they are known as Sherman traps) are used for the capture of a variety of small to medium sized animals, most frequently mammals (Petit & Waudby 2012). They operate using a treadle-plate mechanism, set off when an animal steps on a trigger plate, closing the door (Department of Biodiversity, Conservation, and Attractions 2018a). They are often placed on the ground, but can be secured in trees to catch more arboreal species (Petit & Waudby 2012).

Wire cage traps (of various sizes) are used to capture a variety of medium-large sized animals, often mammals (Department of Biodiversity, Conservation, and Attractions 2018b). Similar to aluminium box traps, they usually operate using a treadle-plate mechanism (Department of Biodiversity, Conservation, and Attractions 2018b).

Traps can be left open to capture diurnal and nocturnal animals and if so they must be checked each day at dawn to remove nocturnal animals and dusk to remove diurnal animals (Petit & Waudby 2012). If only capturing nocturnal animals then the traps are opened at dusk and closed after any caught animals are removed at dawn.

These traps can capture a wide range of small to large-sized vertebrates and are used extensively in fauna surveys for research or biodiversity studies. As they rarely capture small reptiles or amphibians, they are often used in conjunction with pitfall traps.

Definitions

AEC	Animal Ethics Committee
------------	-------------------------

Linked SOPs

SOP ID number	SOP title
WL003	Photographing small vertebrates
WL004	Ear notching small mammals
WL008	Pouch checking small female marsupials
WL012	Dry pitfall trapping for vertebrates
WL015	Euthanasia of small mammals

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

- Field appropriate clothing (e.g. long-sleeved shirt, long pants, hat)
- Enclosed foot ware
- Sunscreen
- Insect repellent
- Appropriate gloves for handling animals

Animal wellbeing considerations

Perceived stressors	Management strategy
Extreme weather	Avoid trapping or close traps in extreme weather conditions. Close pitfall traps if there is excessive rain or heavy rain forecast. Plan ahead and monitor long range and daily weather forecasts.
Exposure in traps	Always ensure appropriate and adequate shelter for the traps (such as a hessian bag to cover cage traps) to offer protection for animals against exposure to adverse environmental conditions.
Trap located near an ant nest	Traps should not be placed in the vicinity of ant nests or ant trails. Move trap to area with no ant nest or trail.
Location of trap in drainage or low-lying area	Traps should not be placed in drainage channels or low-lying areas. If found to be in such as area it must be relocated to a nearby location not experiencing potential flooding.
Disease risk	All handling bags and equipment should be kept clean to minimise risk of disease. Dirty or soiled handling bags should be washed before re-use. Handlers must wash hands thoroughly before and after handling animals.
Handling of animals	Animals should be handled so as to cause minimal stress (such as keeping animals' eyes covered) and under normal circumstances be released as soon as processing is completed.

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

- Aluminium box traps (e.g. Elliott traps) or varying sizes
- Cage traps of varying sizes
- Flagging tape and pen
- Latex gloves (or vinyl/nitrile gloves as appropriate)
- Range of scales (e.g. 10 g, 40 g, 100 g, 250 g, 1000 g etc.) to weigh animals
- Ruler
- Calico (or similar) bags with a method of securely closing the bag (e.g. tapes or strings attached to the neck of the bag)
- Microchip scanner
- Identification books or apps (e.g. FrogID)
- Data sheets
- Alcohol and alcohol wipes
- Ear notching equipment
- Appropriate bait sufficient for the number of traps and trapping duration

Site specification or location requirements

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

Waste disposal

Native wildlife will be returned to their natural habitat. Introduced species such as house mice may be euthanased humanely as per the appropriate SOP. Depending on the property managers, euthanased animals will be left to naturally decompose *in situ* at the study site or disposed of in the UniSQ Biological Waste.

Duration of the procedure

- Several hours to organise equipment
- Setting traps – dependent on the number of traps, but approximately 1-5 minutes per trap.
- Checking traps - dependent on the number of traps, but approximately 1-5 minutes per trap.
- Removal & processing of animals – dependent on animal and species, but approximately 1-15 minutes per animal.
- Monitoring of released animals – 0-3 minutes until the animal has moved out of sight into the surrounding vegetation.

Procedure

Setting traps

1. Assemble sufficient supplies of PPE, and equipment required to perform the procedure including traps, bait, flagging tape, etc.
2. Pre-fill trapping data sheet with non-animal related details such as trap numbers/day/date etc.
3. Setting traps should be conducted late afternoon or dusk (in the cooler part of the day), to minimise stress to trapped animals and not be highly visible to predators if trapped. Setting in the cooler part of the day also reduces the risk of heat stress in both humans and animals.
4. Set traps facing away from the direction in which the sun rises to provide coverage from direct sunlight in the morning.
5. To reduce exposure and improve the rate of capture, set traps under shrubs, beside logs, along animal pathways, or amongst vegetation.
6. Sufficient coverage should be provided on the traps. This may consist of natural vegetation such as leaf litter, or cover such as a hessian bag.
7. The bait should be placed behind the treadle mechanism and towards the back of the trap. Ensure the bait cannot be retrieved from the outside of the trap by reaching through the cage trap wire.

8. Ensure there is no interference with the door closing, such as grass or twigs getting stuck between the door and the trap. Test shutting the trap to ensure it is functioning correctly with no interference.
9. Mark the trap (using flagging tape, GPS, or similar) to ensure all traps are checked the next day.

Checking traps

1. Assemble sufficient supplies of PPE, and equipment required to perform the procedure including datasheets, measuring equipment, calico bags, etc.
2. Pre-fill trapping data sheet with non-animal related details such as trap numbers/day/date etc.
3. Traps should be checked as early in the morning as possible to ensure animals are not exposed to high day-time temperatures and are released back into their natural habitat as soon as possible.
4. Check every trap, shut them, and mark them off on the data collection sheet to ensure no traps are missed. Traps may in some cases be left open during the day for diurnal captures. Should this occur, traps will need to be checked during the day to process any animals trapped.
 - a. Should a trap be lost or misplaced in the field, this must be reported as an adverse event. Every effort should be made to locate a missing trap.
5. If the trap is open with the bait still in place, mark the trap as 'unsuccessful' but 'operational' on the datasheet. If the trap is closed with no animal inside, or open but the bait is missing, mark the trap as 'unsuccessful' and 'inoperational' on the datasheet. If the trap has an animal inside, mark the trap as 'successful' and 'operational'.
6. If a trap is closed, carefully look inside to identify the animal if possible.
7. Remove the animal from the trap and process as per the below procedures.

Removing animals from traps

1. Weigh and record the weight of a clean calico (or similar) bag on the data sheet for that trap. Check that the bag does not have any holes in it except for the opening to reduce risk of escape.
2. Place on appropriate gloves for handling animals.
3. Turn the bag inside out such that any loose threads are on the outside (so the animal doesn't get tangled when in the bag).
4. Place the opening of the bag over the mouth of the trap, and secure tightly around the trap.
5. Through the bag, open the door of the trap, and hold open.
6. For cage traps: remove the hessian bag covering the trap to encourage the animal into the bag. If required, use a short, sharp, puff of air into the face of the animal to encourage it into the bag. For box traps: tip the trap so the animal slides through the open door and into the bag. If required, use a short, sharp, puff of air into the face of the animal through the opposite end of the trap to encourage it into the bag.
7. Once the animal is in the bag, gather the open end of the bag, twist and secure in place with the attached strings or an elastic band (or similar).

Processing animals

1. Weigh the animal in the bag using the appropriate size scales (e.g. 100 g scales for rodents) and record the weight on the data sheet. From this weight, minus the weight of the bag to determine the weight of the animal.
2. Before removing the animal from the bag, use a microchip scanner over the dorsal surface of the animal through the bag to check for a microchip. If there is a microchip, record the number on the datasheet.
3. While the animal is in the bag, gently manipulate the animal such that the animal has its head pointing towards the opening of the bag. Grip the animal as appropriate for the species (e.g. behind the jawbone and holding the rump for possums, a two-finger grip for rodents, etc.). Once firmly held, open the bag to expose the animal, but keeping the eyes covered.
4. While holding the animal in this position, identify the species using identifying features such as teeth, colour, face shape, feet, etc.
5. Carefully expose the ears of the animal (still keeping the eyes covered to minimise stress) to determine if the animal is tagged or notched. If so, record this identification. If not individually identified via tag, notch, or microchip, and the animal is to be given a mark, do so using the appropriate SOP. While the ears are exposed, measure the ear length (if required data).
6. While holding the animal, continue to carefully measure the animal for the required data. This could include foot length, head body length, tail length, scrotal width, etc.
7. Determine the sex of the animal and record on the datasheet. If female, additional data such as teat score may be required. If a marsupial female, the pouch can be checked following 'SOP WL008 Pouch checking small marsupials'.

8. Once processed, natives are released back to their natural habitat. Invasive species such as house mice may be euthanised as per 'SOP WL015 Euthanasia of small mammals'. Record the animals' fate (i.e. released, escaped, died, euthanised) on the datasheet.
9. Within the vicinity of the trap (ideally within 1-2 m radius) find vegetation that offers safe refuge to the animal. Untie the bag and allow the animal to emerge into that vegetation. Observe the animal until it has moved out of view.
10. If there was more than one animal in the trap, repeat the above steps until all animals have been removed and processed.
11. The time taken to remove animals from traps and process them should not be more than a few minutes per animal in usual circumstances.

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

Department of Biodiversity, Conservation, and Attractions (2018a), *Standard Operating Procedure – Aluminium box traps for capture of terrestrial vertebrates*, Version 1.2.

Department of Biodiversity, Conservation, and Attractions (2018a), *Standard Operating Procedure – Cage traps for live capture of terrestrial vertebrates*, Version 1.2.

Petit, S, and Waudby, HP (2012), 'Standard Operating Procedures for aluminium box, wire cage, and pitfall trapping, handling, and temporary housing of small wild rodents and marsupials', *Australian Journal of Zoology*, vol. 60, pp. 392-401.

Licences and permits

Any required licences and/or permits to undertake the procedure(s) under this SOP must be obtained before undertaking this SOP.

Live trapping requires a permit from the relevant permitting authorities in each state of Australia.

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