

Charles Darwin University Animal Ethics Committee



Standard Operating Procedure:

DPAW 9.1 Elliot traps for live capture of terrestrial vertebrates

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NOTE:

Page 3: Section 5.3 (b) Checking Traps:

Traps must be checked early in the morning, NO LATER THAN 2 HOURS after sunrise.



Department of
Parks and Wildlife



Standard Operating Procedure

Elliott traps for live capture of terrestrial vertebrates

SOP No: 9.1

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Department of Parks and Wildlife's Animal Ethics Committee

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Approvals

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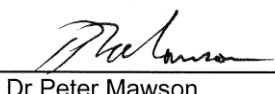
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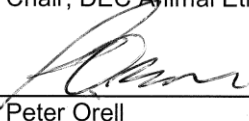
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Appendix I - courtesy of Christine Groom, Judy Dunlop, Juanita Renwick, Manda Page, Neil Thomas and Adrian Wayne.

This document has been reviewed by the Department of Parks and Wildlife's Animal Ethics Committee.

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1 Purpose

Elliott traps (Elliott Scientific, Upwey, Victoria) are used for the live capture of a variety of small to medium sized animals. They operate using a treadle plate mechanism, which is set off when an animal treads on a weight-sensitive trigger plate, and springs the door closed. They are usually placed on the ground but can also be placed in trees to catch semi-arboreal and arboreal mammals.

This standard operating procedure (SOP) provides advice on the use of Elliott traps for non-lethal trapping of fauna.

2 Scope

This SOP applies to all fauna survey and monitoring activities involving the use of Elliott traps (Elliott Scientific Company, Upwey, Victoria), or similar box type traps, undertaken across the State by the Department of Parks and Wildlife (DPaW). It may also be used to guide fauna monitoring activities undertaken by Natural Resource Management groups, consultants, researchers and any other individuals or organisations. All DPaW personnel involved in monitoring using Elliott traps should be familiar with the content of this document.

This SOP complements the Australian code of practice for the care and use of animals for scientific purposes (The Code). The Code contains an introduction to the ethical use of animals in wildlife studies and should be referred to for broader issues. A copy of the code may be viewed by visiting the National Health and Medical Research Council website (<http://www.nhmrc.gov.au>). In Western Australia any person using animals for scientific purposes must be covered by a licence issued under the provisions of the *Animal Welfare Act 2002*, which is administered by the Department of Agriculture and Food, Western Australia (DAFWA).

Please note: Projects involving wildlife research require a licence to take (i.e. capture, collect, disturb, study) fauna for scientific purposes (Reg 17) under the provisions of the *Wildlife Conservation Act 1950*. Other licences may also be applicable and care should be taken to ensure that the appropriate licences and permits are adhered to when planning any project. All projects involving the use of Elliott traps to capture terrestrial vertebrates must be approved by the DPaW Animal Ethics Committee.

3 Definitions

Animal handler: A person listed on an application to the DPaW Animal Ethics Committee that will be responsible for handling animals during the project.

Arboreal: An arboreal animal inhabits or spends large amounts of time in trees.

Scansorial: A scansorial animal is adapted to or specialised for climbing.

4 Approved Trap Types

Most box style traps used in Western Australia are manufactured by Elliott Scientific (Upwey, Victoria) and so are usually referred to as “Elliotts”. Box style traps manufactured by other businesses or with different trigger mechanisms may also be appropriate and their use is not excluded. Projects approved by the DPaW Animal Ethics Committee preferring to use alternative box style traps to those mentioned here may do so if they describe in detail the differences in design and are able to report on the survivorship rates and the welfare impacts. Box style traps manufactured by other companies can be added to the approved trap types section of this SOP if they are shown to be as effective and have minimal level of impact on animals.

Approved trap types:

Large Elliott:

Aluminium folding box trap (15cm x 15.5cm x 46cm) with a treadle release mechanism. This trap is designed for small to medium sized mammals such as phascogales, quenda and chuditch. However, these traps are not as robust as cage traps; they are easily damaged by larger animals and are more

expensive to purchase than cage traps. As such they are not widely used in fauna trapping.

Medium Elliott:

Aluminium folding box trap (9cm x 10cm x 33cm) with a treadle release mechanism. These traps are designed for small mammals (up to 250g) such as phascogales, yellow-footed antechinus, other small dasyurids and rodents, and some reptiles. This is the most versatile and therefore most widely used form of Elliott trap.

Small Elliott:

Aluminium folding box trap (8cm x 9cm x 23cm) with a treadle release mechanism. This trap is designed for small mammals (up to 30g) but has limited application and is therefore not often used.

Optional modification to traps:

Studies have shown the standard Elliott trap to have a low retention rate of a number of different species from the Dasyuridae family, which include the chuditch, yellow-footed antechinus and brush-tailed phascogale. These species are able to open the trap by grasping the edge or corners of the door and lowering it. Brush-tailed phascogales readily attempt to escape Elliott traps and can injure themselves in the process (Rhind and Bradley, 2002; Traill and Coates 1993; Soderquist *et al.* 1996).

A locking mechanism has been developed to improve capture efficiency of Elliott traps for dexterous arboreal and scansorial mammals such as phascogales (Johnson, 1996). The mechanism comprises a shaped-metal tab centrally fixed to the top of the door. Details of how to make and fit the locking mechanism may be found in Johnson (1996).

Modifications including the placement of Elliott traps inside PVC tubing, secured with pin arrangements, have also been used successfully to manage trap disturbance by non-target species (Page *et al.* 2012).

5 Procedure Outline

5.1 Baiting traps

- (a) The standard bait for Elliott traps is a mixture of peanut paste, rolled oats and sardines which is also known as “universal bait”. Medium Elliott traps require a quantity about the size of a 20-cent coin. Refer to Appendix I for more information.
- (b) Other bait types or ingredients may be used if they have been identified as appropriate and approved for use for a particular project or species.
- (c) Care must be taken when baiting traps to ensure that the bait does not impede the trigger mechanism. To avoid bait rolling underneath the treadle plate and rendering the trap inoperative, it is recommended that bait balls are slightly squashed so that they cannot roll.

5.2 Setting traps

- (a) The location and configuration of trap placement (i.e. transect or grid) as well as the number of traps will be determined by the purpose of the study and should be planned before commencing the survey.
- (b) If setting traps along roads or vehicle tracks, the traps must be set so that they are not readily visible from the road to avoid public curiosity and possible theft of traps. Traps must be placed a **minimum** of 5m from the road edge except where the density of the vegetation makes this impracticable.

If securing the trap to a tree, check that the branch is solid and that it can support the trap and any possible occupant. Brackets can be secured and nailed into the tree to support the trap and prevent it from falling; however traps should be secured in an appropriate method that ensures that the trap is able to function properly.
- (c) Trap locations must be marked with flagging tape and numbered. A GPS reading for each trap is also recommended and is required for long-term monitoring sites (e.g. Western Shield transects). The location information for permanent monitoring trap sites should be recorded on

datasheets.

- (d) Traps must be set in level positions using natural cover wherever possible (see example in Figure 1). Debris can be cleared from under the trap to ensure stability. Shade is critically important in warm to hot weather. Elliott traps must never be exposed to full sunlight as animals can easily die of heat stress. Give consideration to shade movement when placing traps, particularly early morning sun exposure.



Figure 1 A well-protected Elliott trap set in the base of a burnt out tree (Photo by C. Freegard/DPaW).

- (e) In colder weather, if the air temperature is likely to drop below 10°C, Elliott traps should have an insulating material such as cotton wool or leaf litter placed inside them to provide protective bedding for captured animals. Other materials that have been used to insulate Elliott traps include toilet paper or strips of felt cut to size. When using insulating material you need to ensure that the selected insulating material does not impede the treadle or door of the trap.

Additionally to reduce the chance of animals suffering from hyperthermia, a plastic bag or plastic wrap can be secured around two thirds of the trap to provide protection from wind and rain, whilst still permitting adequate ventilation. Hessian cut to size can also be placed on the outside of the traps in dry weather to reduce temperature extremes within the trap.
- (f) The trap door and mechanism must be checked and tested before each trap is left.
- (g) It is recommended that traps are set for a minimum of three consecutive nights (preferably more, but consideration should be given to the impact on individuals that may be trapped every night, especially if they have dependent young).
- (h) All traps must be accounted for before and after each trapping session.

5.3 Checking traps

- (a) All traps must be accounted for when setting and checking traps. Personnel that are undertaking the trapping must keep tallies of traps to ensure that all are checked. There is no excuse for leaving unchecked traps set in the field. It is responsibility of the lead personnel at the survey location on each trapping day to ensure that all traps are accounted for and that the impact on animal welfare is minimised.
- (b) **The timing and frequency of trap checking is determined, by giving consideration to mitigation of the animal welfare risks associated with Elliott trapping and each project situation (see Section 6 Level of Impact).** Consideration must be given to the species composition likely to be trapped at the site and their biological characteristics. Trap checking timing and frequency must be adapted to suit the biology of the target species and the associated environmental conditions at the time of trapping.

Where only nocturnal species are being targeted, traps must be checked early in the morning no later than 3 hours after sunrise (as early as possible in high temperature conditions) and remain closed until the following evening. If diurnal species such as reptiles are the target species, traps should be checked after periods of peak activity (e.g. late morning in the case of

reptiles). Traps that are remaining open during the day must be in a shaded position throughout the day, and where conditions are conducive to particularly hot weather or if there is a risk of bird or diurnal mammal capture, checking must occur more frequently throughout the day.

If checking of traps cannot be completed within an appropriate timeframe, trap numbers must be reduced or the number of personnel increased before any further trapping occurs.

Trapping must not be undertaken in extreme thermal or wet weather conditions.

- (c) The animal handler must carry an appropriate handling bag when approaching a trap to ensure efficient removal of the animal from the trap (see SOP 10.1).
- (d) Bait within each trap should be checked daily and replaced when necessary. Traps without bait reduce the validity of trapping results.
- (e) The presence of ants in the trapping area can lead to detrimental impacts on captured animals. Surface insecticide (e.g. permethrin based products like Coopex ®) can be applied around traps to discourage ants. Surface insecticides should never be used inside traps and should not be used routinely as they can be harmful to trapped animals, particularly frogs and reptiles. Powder and spray forms are available, however extreme care must be taken to ensure that no free standing liquid droplets remain when using the spray form as absorption/ingestion can be lethal to frogs and reptiles. Always read the MSDS of chemicals before use. If ants become highly attracted to the trapping area, remove the traps and relocate them to a more suitable position.
- (f) Trapping data should be recorded on an appropriate trapping datasheet and database.

5.4 Picking up traps

- (a) All traps must be accounted for when picking up traps. Personnel undertaking the trapping must keep tallies of traps to ensure that all have been collected and that there are no traps remain in the field. If traps are not being collected immediately after checking (i.e. traps are not being checked and picked up simultaneously), the traps must be closed on checking and remain closed until they are picked up. There is no excuse for leaving traps set in the field. Responsibility of animal welfare rests with the lead personnel at the survey location during fauna trapping events.
- (b) Remove residual bait from traps and preferably dispose of it off-site and in a manner that ensures it does not attract fauna. Flagging tape should also be removed from the area as it is only a short term marking method.

5.5 Removing animals from traps

- (a) Animals must be removed from the trap as efficiently as possible.
- (b) First, check what kind of animal is in the trap. The first clue will be the weight of the trap when picked up. Gently push in one end of the trap so that you can see inside but can quickly close the trap if the animal attempts to escape.
- (c) If the animal is venomous, take particular care. If no measurements are required, it may be easiest to choose a location where it is possible to place the trap on the ground in a vertical position, pull the pin in the side of the trap allowing the trap to unfold and to release the animal, and quickly move away from the trap.
- (d) To remove small animals from the trap into a bag, gently turn the trap upside down, wrap the opening of the bag around the opening of the trap, depress the door until it clicks open (or manually hold it open) and then gently slide the animal into the bag. Turning the trap upside down helps to avoid the animal getting caught under the treadle or door. It also helps prevent the door closing on the animal as it exits the trap. Care must be taken to ensure that the occupant of the trap is not crushed when the door is opened to extract the animal.

If the animal is large such that there is little room to open the door (e.g. quenda) then place the entire trap in an appropriate bag (see SOP 10.1) and pull the pin on the side of the trap. Ensure that the animal is at the bottom of the bag and extract the trap before securing the top of the bag.

- (e) Once you are sure the animal is in the bottom of the bag, grasp the top of the bag and tie the

opening closed.

- (f) Captured animals must be released at point of capture (unless the purpose of the trapping is translocation, specimen collection is required or otherwise approved). Animals must be released, or reach an alternate endpoint approved by the DPaW Animal Ethics Committee, within 24 hours of capture. Animals must be released at a time that is appropriate to their normal activity and caution taken to reduce exposure to risks such as predation i.e. nocturnal animals should be released early morning or kept until late afternoon before release at the point of capture.

5.6 Trap care and maintenance

- (a) Traps must be maintained in good working order and cleaned after each trapping session. The trap release mechanism must be kept clean of bait and scats. Clean traps reduce the risk of spread of disease to trapped animals and animal handlers. Advice on cleaning and disinfection of traps is available in *SOP 16.2 Managing disease risk in wildlife management*.

The most efficient way to clean Elliott traps involves removing the pin and unfolding the trap to expose the interior, which can then be scrubbed clean with disinfectant and a stiff brush prior to the trap being reassembled. Take care not to lose the pins.

- (b) Any damaged traps requiring attention need to be flagged and labelled in the field when a problem is identified so that it can be attended to promptly and abstained from use until repaired.

6 Level of Impact

Potential animal welfare impacts of Elliott trapping include:

- Stress, injury and/or self-harm as a result of an extended period in confinement
- Stress and/or survival disadvantage as a result of inappropriate handling and release technique, timing and location
- Stress as a result of harsh environmental and/or thermal conditions within the trap
- Stress or mortality as result of interspecific interaction in trap (i.e. ants)
- Trauma (e.g. tail injury from door mechanism)
- Hypothermia
- Hyperthermia
- Dehydration
- Starvation (e.g. dependent young of captured lactating female)
- Distress (caused by discomfort, social isolation, separation of mother and young, exposure to predators, etc.).

If the Elliott traps are properly monitored and preventative actions are utilised then the impact is small and only short-term. Field planning must involve risk mitigation of the above potential impacts to the full extent possible.

7 Ethical Considerations

To reduce the level of impact of Elliott trapping on the welfare of animals there are a number of ethical considerations that should be addressed throughout any projects that involve the use of animals and these procedures. DPaW projects involving Elliott trapping will require approval from the DPaW Animal Ethics Committee and, where appropriate, the following ethical considerations must be adequately covered in any Application for Approval to Undertake Research Involving Vertebrate Animals.

7.1 Animal handling

To ensure minimal stress to the animals they should only be handled for as long as required to identify, mark, weigh and measure them (usually no more than five minutes). If trapping is targeting nocturnal species then traps should be opened at dusk (to avoid animals being captured during the day) and be checked at dawn to avoid heat stress and possible death of the animals or their young. If targeting diurnal species such as reptiles, traps should be checked throughout the day as appropriate for the

weather conditions and the biology of the species likely to be trapped at the site. Consideration must be given to the potential animal welfare impacts associated with trapping and handling animals (see Section 6 Level of Impact) and mitigation measures in place as applicable at the individual project level.

7.2 Trap placement

Traps must be placed in suitable locations and at a suitable time to reduce exposure of the animals to light, temperature extremes and precipitation. For example, take into account the movement of shade during the day, prevailing winds and drainage in wet conditions. Traps must not be located in the vicinity of high ant activity.

7.3 Breeding season

Avoid trapping in breeding seasons when offspring may be separated from their captured parents. Lactating females should be released as soon as possible. Any trap that captures the same lactating female for two successive days/nights should be closed or relocated.

7.4 Weather

All small animals are susceptible to exposure in traps, including cold dry weather (e.g. phascogales as reported by Traill and Coates, 1993). Avoid trapping in extreme weather conditions (hot, cold or wet and/or strong winds). Plan ahead by monitoring long-range and daily weather forecasts. Suitable bedding or insulation may be provided inside the trap in cool weather as a precaution.

7.5 Unexpected deaths

If unexpected deaths or euthanasia occur, it is essential to consider the possible causes and take action to prevent further deaths. For projects approved by the DPaW Animal Ethics Committee, unexpected deaths or euthanasia must be reported in writing to the Animal Ethics Committee Executive Officer on return to the office (as per 2.2.28 of The Code) by completing an Unexpected Death or Emergency Euthanasia Form. Guidance on field euthanasia procedures is described in *SOP 15.1 Humane killing of animals under field conditions in wildlife management*. Where disease may be suspected, refer to *SOP 16.2 Managing disease risk in wildlife management* for further guidance.

8 Competencies

DPaW personnel, and other external parties covered by the DPaW Animal Ethics Committee, undertaking Elliott trapping require approval from the committee and will need to satisfy the minimum competency requirements detailed in Table 1. This is to ensure that personnel involved have the necessary knowledge and experience to minimise the potential impacts of Elliott traps on the welfare of the animals. Other groups, organisations or individuals using this SOP to guide their fauna monitoring activities should also meet these minimum competency requirements as well as their animal welfare legislative obligations.

It should be noted that details such as intensity of the study being undertaken will determine the level of competency required and Table 1 provides advice for basic monitoring only.

Table 1: Minimum competency requirements of Animal Handlers of projects using Elliott traps to capture fauna.

Competency Category	Competency Requirement	Competency Assessment
Wildlife licences	1.1 Licence to take fauna for scientific purposes (Reg 17) OR	Provide SC (DPaW personnel only) or SF licence number

Competency Category	Competency Requirement	Competency Assessment
	1.2 Licence to take fauna for educational or public purposes (Reg 15)	Provide TF licence number
Formal qualifications and course certificates (Note: Suitable levels of skills/experience can substitute for formal training requirements)	3.5 TAFE qualifications in fauna management and handling OR 3.7 CALM Mammal Conservation Course (1992 - 1995) OR 3.8 CALM/DEC/DPaW Fauna Management Course (1997 -) OR 3.10 Tertiary degree units in fauna handling	Provide course year, TAFE facility Provide course year Provide course year Provide graduation year, University
General skills/experience	5.1 Relevant knowledge of species biology and ecology	Personnel should be able to correctly identify the likely species to be captured in Elliott traps for the site/s being studied. This knowledge may be gained from sufficient field experience and/or consultation of field guides and other literature. Estimated total time in field: Minimum 1 year involved in similar projects.
Fauna survey and capture skills/experience	6.1 Experience in setting and use of live traps - cage, Elliott, pit, Bromilow AND 6.3 Training and experience in trap hygiene, disease transmission	Personnel should be confident at identifying the best locations to set traps and how to set traps so that the mechanism works and animal welfare is considered at all times. This knowledge may be gained from sufficient field experience and/or consultation of literature. Estimated total time in field: Minimum 1 year involved in similar projects. Personnel should be familiar with hygiene procedures. This knowledge may be gained from sufficient field experience and/or consultation of literature. Estimated total time in field: Minimum 1 year involved in similar projects with similar species and /or techniques.

Competency Category	Competency Requirement	Competency Assessment
Animal handling and processing skills/experience	7.1 Experience in handling terrestrial mammal fauna	Personnel should be confident at handling and restraint of the range of species likely to be captured. This knowledge may be gained from sufficient field experience and/or consultation of literature.
	AND	Estimated total time in field: Minimum 1 year involved in similar projects with similar species and /or techniques.
	7.2 Experience in handling terrestrial herpetofauna	Personnel should be confident at handling and restraint of the range of species likely to be captured. Personnel should be familiar with reptile identification methods such as scale counts. This knowledge may be gained from sufficient field experience and/or consultation of literature. Estimated total time in field: Minimum 1 year involved in similar projects with similar species and /or techniques.

9 Occupational Health and Safety

First aid kits should always be carried in vehicles. You must be aware of your own safety and the safety of others as well as the animals during handling.

It is recommended that a job safety analysis is undertaken prior to undertaking monitoring using Elliott traps at your site. This safety analysis should include the following considerations.

9.1 Animal bites and scratches

Removing animals from Elliott traps can result in injuries to handlers from the animals inflicting bites and scratches. All injuries should be appropriately treated as soon as possible to prevent infection and promote healing. If DPaW personnel or volunteers are injured, an "Incident and Near Hit Notification" form must be completed and forwarded to DPaW's Risk Management Section.

9.2 Zoonoses

There are a number of diseases carried by animals that can be transmitted to humans (i.e. zoonoses such as Toxoplasmosis, Leptospirosis or Salmonella). Advice on minimising disease risk is provided in *SOP 16.2 Managing disease risk in wildlife management*.

9.3 Allergies

Some personnel may develop allergies when they come in contact with animal materials such as hair and dander. Personnel known to develop allergies should wear gloves when handling animals and long sleeved pants/shirt.

Personnel and volunteers with severe allergies associated with animals, with immune deficiency diseases or on immunosuppressant therapy should not engage in the handling of wildlife.

Personnel with a known or suspected peanut allergy will need to take appropriate precautions when in contact with universal bait and traps.

10 Further Reading

It is recommended that the following SOPs and further reading information are also considered when proposing to undertake Elliott trapping.

SOP 10.1 Animal handling/restraint using soft containment

SOP 10.2 Hand restraint of fauna

SOP 15.1 Humane killing of animals under field conditions in wildlife management

SOP 16.2 Managing disease risk in wildlife management

Environmental Protection Authority and Department of Environment and Conservation (2010) *Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (eds B.M. Hyder, J. Dell and M.A Cowan). Perth, Western Australia.

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APPENDIX I Mixing Universal Bait

Equipment

Mixing bowl or bucket
Mixing spoon (optional – can just use your hands)
Container with lid to store bait
Disposable gloves

Ingredients

500g Quick cooking oats
2 kg (5-6 375g tubs) Smooth peanut butter
Optional - Between 110g (1 tin) and 636g (6-8 tins) Sardines (preferably in oil, or springwater)
Optional - Cooking oil, preferably peanut oil

Note: Avoid using ingredients that contain additives, preservatives or artificial colours and flavours.

Serves: makes enough bait for approximately 100 cage traps for 4 trap nights.

Methodology

1. Ensure staff mixing bait are not allergic to peanuts.
2. Place oats and sardines into clean mixing bowl or bucket and mix so that the sardines are well distributed though the oats.
3. Mix in peanut butter until the oats and sardines are well distributed and the mixture is not too dry or too sticky. Form a ball that is sticky and cohesive. Keep in mind that the mixture will become drier over time as the oats absorb the oil from the peanut butter.
4. Store bait in a sealed container.
5. Clean bait mixing equipment.
6. Add extra peanut butter if mixture becomes too dry. Water or cooking oil can be used if extra peanut butter is not available.

Optional: Bait can be pre-rolled.

Roll bait into balls ready for placing in traps (approx 50c coin size for cage traps and 20c coin size for Elliott traps). The bait balls can be counted to match the number of traps being set. This will ensure that you have enough bait for all traps being set and will also act as an additional check to ensure all traps have been set and baited.

Animal Welfare

To reduce the risk of impact of the use of universal bait on wildlife ensure that bait is stored for no longer than the specified period of 5 days fresh, or 3 months frozen, to avoid the risk of the components rendering unsuitable for consumption. Where possible do not leave bait in open sun. Any old bait should be disposed of after trapping and not frozen for later reuse.

Potential animal welfare impacts of mixing universal bait include:

- Food poisoning
- Changing behaviour by providing a food source

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