

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

- Avian species

## Purpose

This procedure was written as part of a suite of SOPs for the assessment of various raptor monitoring techniques. Population surveys and monitoring play a key component to many ecological research projects and are an important conservation tool. However, raptor monitoring is time consuming and expensive, resulting in a decline in monitoring raptor species in Australia. The project looks to optimise raptor monitoring by determining the efficacy of various monitoring technologies and techniques available to wildlife conservation. It is important to use traditional methods in concurrence with these novel methods to provide a baseline to compare against.

The purpose of this specific procedure is to determine the efficacy of using baited camera station surveys for monitoring diurnal raptor species. This is a commonly used technique for monitoring many different species of animals. This procedure has been kept purposefully broad to be used for other groups of animals in the future.

Definitions	
<b>Vertebrate</b>	Any species of animal (non-human) that includes a vertebrate skeleton, i.e. mammals, reptiles, amphibians, birds and bony fish.
<b>Virus</b>	An infectious agent of small size and simple composition that can multiply only in living cells of animals, plants or bacteria.
<b>Zoonosis</b>	Any of a group of diseases that can be transmitted to humans by non-human vertebrate animals, such as mammals, birds, reptiles, amphibians and bony fish. A large number of domestic and wild animals are sources of zoonotic diseases, and there are numerous means of transmission.
<b>Exposure</b>	Bringing oneself into contact with a disease for a period of time.
<b>Bait station</b>	A location that has been set up to encourage animals to visit by use of bait. May or may not include a platform or enclosure to exclude non-targeted species.
<b>Trail camera</b>	A wildlife camera designed to trigger in the presence of an animal.
<b>Python lock</b>	A cord based lock which acts similar to a bicycle lock, threaded through the back of the camera and around a tree/platform to reduce the chance of a camera being stolen.

Linked SOPs	
SOP ID number	SOP title
Not applicable	

Potential hazard to Research Workers	
UniSQ Risk Management Plan ID number	UniSQ Management Plan title
RMP_2021_5257	Raptor monitoring techniques research - fieldwork

## Personal Protective equipment required

- Disposable examination gloves – various sizes
- Cut-resistant gloves
- Enclosed footwear
- Sunscreen
- Insect repellent

Animal wellbeing considerations	
Perceived stressors	Management strategy
Ingestion of rotting bait	Bait will rot, and potentially harmful bacteria will replicate. This will be accelerated on hot days and prolonged exposure to the sun; where possible, a shaded location will be selected for the bait platform. Bait that has the potential to rot should be renewed daily, with the old bait removed, and the platform/enclosure cleaned with detergent and disinfected, if used. 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.
Disruption of trophic relationships	Providing food to wild animals can disrupt local trophic relationships if conducted over a prolonged period. This can have unknown consequences which could potentially damage the ecosystem. Furthermore, feeding stations can become a risky location for prey if frequently visited or stayed at for prolonged spells. To minimise this risk, baiting stations will only remain at a single location for a maximum of a week. A period of at least 3 months should be left before re-using the baiting station at the same location.
Accidental entanglement or injury caused by bait restraint	The bait may be restrained to a platform to maximise the length of time animals will be in the focal area of the trail cameras, maximising identification success. The bait will be held in place using an appropriately sized stainless steel bolt, either straight or U-shaped, depending on the type of bait used. This minimises the chance of animal entanglement by restraining the bait. The bolt will be fixed around or through a suitable bone in the bait (i.e. around the vertebrae of a rabbit or through a bone of a kangaroo limb). A short lead made from a soft-style washing line will be used to fix the bait bolt to an eye-bolt on the platform. This lead will use stainless steel hoops and fixing with a small size tolerance to ensure there are no spaces in which an animal could get entangled. To minimise the chances of accidental entanglement, the bait will have a short lead (less than 20 cm) restraining it to the platform. Stainless steel fixings will be used throughout for ease of cleaning, reduced corrosion and minimal chance of metal entering animal's diet.
Attraction of non-targeted vertebrate species	The goal of a baited camera station is to target certain species. Bait type is selected according to the diet of the target species. However, non-targeted species will inevitably be attracted to the bait. A platform can be used to raise the bait away from the ground if targeting climbing or flying species. Various enclosures can be used to restrict access to larger animals, or to minimise the risk of predation of animals using the bait station. The bait station should be carefully designed to minimise visits from non-targeted species.
Use of feeding platform	The design of a feeding platform should be carefully considered to minimise the chance of injury to any species using it (targeted or non-targeted). It should also be designed to mimic the type of materials the animal would likely use in its natural environment. For example, a feeding platform for birds of prey might include perches made from either stripped ironbark branches or wooden dowel wrapped in cotton cording. Ironbark branches would be selected for larger eagle species which typically perch in mature trees, whereas the dowel alternatives may be used for smaller species to provide more accurate dimensions suitable to the feet of such birds. Cotton cording would be used as this mimics the feel of bark, allows grip, and is less likely to cause abrasion to the feet of the animal or cause an issue if accidentally ingested than synthetic alternatives. The edges and surfaces of any wooden fixings should be sanded to minimise the chance of splinters. This is just one example, and a full platform design should be conducted with the assistance of personnel with experience of the targeted species.

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

- Knife block and knives
- Meat cleaver
- Cutting board
- Sealable freezer bags
- Buckets
- Freezer
- Stainless steel bolts and bait tether
- Feeding platform (if required)
- Trail cameras
- Python locks (for cameras)
- Memory cards
- Rechargeable AA batteries
- Cleaning brushes
- Cleaning detergent
- Disinfectant
- Disposable gloves – various sizes

## Site specification or location requirements

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

## Duration of the procedure

- 1 day to 1 week in duration in any given location

## Procedure

### 1. Bait station design

The design of the bait station should be carefully considered to minimise use by non-targeted species, minimise the risk of injury to animals, and be easy to transport, set up, monitor and pack up and remove. The following questions should be answered in the design process:

1. What are the target species?
2. What bait would be suitable for the targeted species?
3. How quickly will the bait decompose?
4. How much bait is required?
5. Should the bait be physically restrained? If so, how can the risk of entanglement be minimised?
6. Does the bait station need to be raised to exclude certain species? To what height should it be raised?
7. If using a platform, how large should it be? Does it need specific features like a perch? What should it be made from? What surface is required?
8. Does the bait station need an enclosure with restricted access to exclude certain species and/or provide protection to prey?
9. How accessible are the locations you wish to use the bait station?
10. What weather conditions will the bait station experience?
11. Is shade or physical obstruction required for the targeted species?
12. Does the enclosure block the view of the cameras? If so, does it require built-in cameras?
13. Where will the cameras be located in relation to the station?
14. How many cameras are required?
15. Are the targeted species diurnal, crepuscular or nocturnal?
16. Will non-targeted animals that cannot be excluded rapidly consume the bait?
17. How will the station be cleaned and disinfected? How frequently will this occur?
18. How will the bait be renewed?

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19. Will the scent of humans put off the target species from visiting the bait station? If so, how can this be mitigated?
  20. How heavy will the bait station be?
  21. How can the bait station, bait and camera equipment be efficiently transported?

## 2. Bait preparation

- Clean hands thoroughly before and after bait preparation.
- Disposable gloves should be used for the preparation of meat-based baits.
- Cut-resistant gloves should be used when using knives.
- Bait should be prepared in a clean environment with access to preparation tools such as knives and cutting boards.
- Care should be taken when using wild-caught bait to ensure that disease is not transmitted to personnel or animals.
- Bait should be placed in a sealable freezer bag in the portion size required for a single day of baiting at the selected bait station.
- Most bait types can be frozen and defrosted when required for use. This is an efficient way of preparing bait and is encouraged where possible. Bait should be defrosted and stored in a fridge to keep it as fresh as possible.
- Bait should be prepared with fresh ingredients. As a rule, if it is not fit for human consumption, it should not be used for bait.
- Consider how you will carry the bait into the field; a bag may be required if carrying significant quantities of bait.
- Clean away any off-cuts from preparing bait, wipe down surfaces and disinfect.
- Dispose of off-cuts via appropriate waste disposal.

## 3. Equipment transport

- A baited station will require trail cameras and bait. It may also require python locks for the cameras, bait restraints, post to attach the camera, tools to drive in the post, the raised platform, platform tie-downs, pegs and enclosure to restrict non-target species.
- Access to the location may determine what can or cannot be transported for use as a bait station.
- If travelling long distances on foot, minimise the weight of the equipment and use methods of carrying equipment that are efficient.
- If using a platform or enclosure, it is likely that more than one person will be required to transport equipment; plans for this.
- Where possible access the bait station location using a vehicle to minimise set up time and reduce chance of injury from carrying equipment.
- Do not carry weights that are too heavy or obstruct the view in front of you. This will likely cause an injury.
- Avoid transporting equipment and set up at night.

## 4. Bait station set up

- Follow any field site protocols in place for sign-in/out, induction etc.
- Select a site that is suitable for the targeted species.
- Try and use a shaded location if possible to reduce the decomposition of the bait.
- If using an enclosure or platform, ensure it is anchored using tie-down ropes and pegs.
- If targeted species are sensitive to human scent:
  1. Use of non-scented antiperspirant.
  2. Refrain from using insect repellent.
  3. Try to minimise the area that you work in.
  4. Travel in and out of the area using the same path.
  5. Apply an evaporative disinfectant to any platform or enclosure to remove the scent.
  6. If possible, cover where you have walked to the station and the area of working with leaf litter.
- Set-up cameras and test before leaving bait.
- Record the GPS location of the bait station.
- Record a description of the environment in which you set-up the bait station.

## 5. Camera set up

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- Before going out, ensure cameras are fully charged and have memory cards with enough space to capture the recordings you require.
  - Identify where you will set up the trail camera(s). Think about how large you require the field of view to be.
  - Consider any moving shadows or vegetation, set up cameras to minimise the capture of this as it will cause false triggers. This may mean a horizontal or vertical camera setup.
  - Check the settings on the camera(s):
    1. Set time and date, if not set.
    2. You will likely want video capture for 30 seconds (if possible) with as small a latency period as possible between captures.
    3. The sensitivity setting will depend on the targeted species and if you have a lot of vegetation or shadows in the field of view.
    4. Set whether to capture during the daytime, at night or both.
    5. If capturing at night, you will likely want the flash turned off to not scare away any animals from the area.
    6. Make sure the memory card has been wiped of previous contents prior to use.

## 6. Bait renewal

- Follow any field site protocols in place for sign-in/out, induction etc.
- Renew bait daily if it contains meat, dairy or other decomposable products. It is likely you will want to renew bait daily as it should have been eaten.
- Clean down the surface of the platform or enclosure daily if it contains meat, dairy or other decomposable products. Use an evaporative disinfectant.
- Remove any tethers that are no longer being used.
- Check camera battery life and how many new recordings have been made. It may not be practical to review recordings in the field, but a lot of recordings and/ or low battery life may be the result of a significant quantity of false triggers. If this is the case, adjust the bait station set up to reduce false triggers, record the new position, the height of cameras etc., with the date and time of change.

## 7. Bait station pack up

- Follow any field site protocols in place for sign-in/out, departure etc.
- Place A4 board with site location, date and time of finish, the person setting camera and camera ID in front of the camera to record this information.
- Turn off cameras and take them down. Copy contents of memory card onto dedicated UniSQ monitoring server. Delete contents of memory cards, charge camera batteries and return cameras to the equipment storage facility.
- Remove any bait, placing it in a sealable freezer bag. Dispose of bait via appropriate waste disposal route.
- Disassemble any enclosure or platforms, remove tie-downs and pegs.
- Thoroughly clean any platform/ enclosure used. Return platforms, enclosures and tie-down equipment to the equipment storage facility.
- Leave bait station site as it was found.

## 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

Nil.

## Licences and permits

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

SOP approval and review history			
Date	Version	Review Pathway	Notes
2 June 2021	0.0	<b>15/04/2021</b> UniSQ AEC “Subject to Modifications.” <b>02/06/2021</b> Reviewed and approved by the UniSQ AEC Executive.	N/A
23 June 2021	0.1	23/06/2021 Added under “Licences and permits”, the words: “ <i>Any required licences and/or permits to undertaken the procedure(s) under this SOP must be obtained before undertaking this SOP.</i> ”	N/A
11 April 2024	1.0	<b>11/04/2024</b> UniSQ AEC reviewed and approved.	3 year review