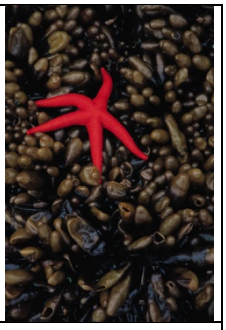
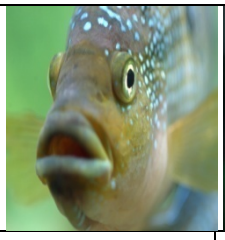
Flinders University

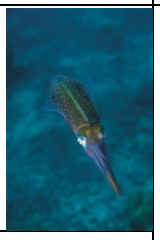
College of Science and Engineering

Standard Operating Procedure

For the Use of Marine and Aquaculture Facilities 18/06/19





Animal Facility

SOP Number	AWC Approval Date	
SOP-BIOL-1-M/AFac.	18/06/2019	
Contact Person	**SOP prepared by**	**Review Date**
Leslie Morrison	Leslie Morrison	June 2021

Contents

The SOP **Use of Marine and Aquaculture Facilities** contains the following sections:

Legislation

- *Australian Code for the Care and Use of Animals for Scientific Purposes 8th Ed.*
- *Animal Welfare Act 1985*
- *Animal Welfare Regulations 2012*
- *Gene Technology Act 2000* (the Act)
- *Gene Technology Regulations 2001*
- *Work Health and Safety Regulations 2012*
- *Fisheries Management Act 2007* (Section 115)
- *South Australian National Parks and Wildlife Act 1972*

University Policy

- Work Health and Safety Policy 2013
- Responsible Conduct of Research Policy 2016
- NHMRC Guidelines

Local Policy

Use of the College of Science and Engineering Animal Facilities by all staff and students of the College of Science and Engineering, Flinders University, is subject to awareness of, and adherence to the following:

Research Involving Animals:

- The University holds a licence for the use of animals for teaching and research purposes. To satisfy the requirements of the licence, anyone wishing to undertake teaching and research using animals must submit a proposal to the Animal Welfare Sub-Committee (AWS-C). No work with animals may commence until written approval has been received from the Animal Welfare Committee (AWC). Standardised application forms for Laboratory, Teaching and Wildlife work with animals can be found on the Flinders University Animal Welfare Committee website listed below. It is your responsibility to regularly check this site for updates to guidelines, forms etc.

  http://www.flinders.edu.au/research/researcher-support/ebi/animal-ethics/animal-ethics_home.cfm

- **All staff and students involved in animal research must complete Animal Ethics Online Training (AEOT) and must also regularly attend Animal Researcher Information Sessions (ARIS).**

Standard Operating Procedures

Refer to Risk assessments, Standard Operating Procedures and Safe Operating Procedures for chemicals, processes and plant equipment where appropriate. All projects must have an accompanying Risk Assessment signed by the Chief Investigator and submitted to the College of Science and Engineering OH&S Manager.

The following are a list of the main SOP's governing working with animals in the College of Science and Engineering. An extensive database of specific technique SOP's is also available from the Animal Facility Manager and on the AWC home page.

- **Standard Operating Procedure and Safe Work Procedure for the Use of the Animal Facility, Aquaculture and Marine Aquarium Facilities**
- **Standard Operating Procedure for Working With Fish**
- **Standard Operating Procedure for Working With Reptiles**
- **Standard Operating Procedure for Working With Birds**

Permits

- Any research to be undertaken in the field may require a permit from Department for Environment, Water and Natural resources (DEWNR). http://www.environment.sa.gov.au/licences-and-permits/Animals_in_captivity_permits

- The Animal Facility Manager holds a Marine Specimen Collection exemption, that may be used by nominated delegates, or you may obtain your own at http://pir.sa.gov.au/fishing/permits_and_exemptions

- Collection and live transport/holding of noxious species/declared pests will require a specific permit from The Department of Water, Land and Biodiversity Conservation (DWLBC), and The Department of Primary Industries and Resources of South Australia (PIRSA).

- The College of Science and Engineering holds an Aquaculture licence that covers all species endemic to South Australia. If you wish to hold non endemic species, please check with the Animal Facility Manager to see if they are covered by our current licence or if a permit variation will be required.

While your research may not involve animals as defined by the Australian Code, and therefore not require an application for the use of animals, it is necessary to provide details of organisms you propose to use to the AWC, so as to register their use and identify potential situations where an application will still be required. For example: marine or terrestrial invertebrate collecting which includes the 'by catch' of non-target animal species will require an application must be submitted to the AWC.

General

- Wash hands with disinfectant upon arrival at facility, and before leaving.
- Refer to supporting Standard Operating Procedures and Safe Work Procedures.
- No eating, drinking, or smoking, in areas housing animals.
- Wear shoes at all times (not thongs).
- An Unexpected Adverse Event is an event that is not expected and was not foreshadowed in the application approved by the AWC.

Emergency Evacuation

- **In the event of an emergency evacuation, staff must move to local assembly points to await further instruction. If there is sufficient prior notice, fish may be moved-in consultation with the project C.I. and as per "*SOP- Working with Fish*" to a temporary new location that can maintain their husbandry requirements; until such time as they can be returned to the College of Science and Engineering Animal Facility.**

Induction

All users of facilities are required to undergo induction. Induction will familiarise you with the Safe and Standard Operating procedures for the facility and any training required. This induction will also provide an overview of operation of aquarium systems and the monitoring and recording of water quality parameters.

Project proposal approved	**Yes/No**	**Date:**
Any hazardous/toxic substances used RA supplied	**Yes/No**	**Date:**
Project Risk Assessment completed	**Yes/No**	**Date:**
Safe Work Practice supplied	**Yes/No**	**Date:**
Booking form completed and signed	**Yes/No**	**Date:**
Room/tank labels issued	**Yes/No**	**Date:**
Swipe Access/key issued	**Yes/No**	**Date:**
Attended Biology OH&S induction	**Yes/No**	**Date:**
Shown emergency exits/fire extinguishers in facility	**Yes/No**	**Date:**
Shown handwash station and first aid kit	**Yes/No**	**Date:**
Location of phones and emergency numbers/signage	**Yes/No**	**Date:**
Inducted in SOP document	**Yes/No**	**Date:**
University Induction for new staff- booked in/undertaken	**Yes/No**	**Date:**
Familiarised with University website and relevant links	**Yes/No**	**Date:**
Identified any other health and safety training required- hazardous substances training, First Aid, OH&S online.	**Yes/No**	**Date:**
Immunizations current	**Yes/No**	**Date:**
Swipe Card and Payroll access submitted	**Yes/No**	**Date:**
Supplied with SOP's for Animal Facility	**Yes/No**	**Date:**
Complete initial training sessions under supervision	**Yes/No**	**Date:**
Complete required tasks without supervision	**Yes/No**	**Date:**
Discuss and initiate further training requirements as required	**Yes/No**	**Date:**

Modification to Projects/Facilities

- Any form of modification planned to existing facilities should be discussed with the Animal Facility Manager. Modifications to existing systems may require approval from the AWC, and cost must be budgeted for in the projects funding.
- Modifications to existing experiments need the approval of the AWC. The modification form can be found on the AWC homepage.
- Changes to diet, room, aquarium temperature, light cycle, etc. should be discussed at least a week before any changes are planned.

Communication Book

- General information is to be written in the book located in the main hallway of the Animal Facility. Please include your name and date, and check the book as regularly as possible.
- All animal movements within your booked space (inside/outside, tank to tank, etc.) and changes to normal holding conditions are to be put in the book before animals are moved or conditions changed.
- All deaths, births, arrivals, departures, missing animals, and changes in behaviour/health concerns, must always be recorded in this book as they form part of the mandatory monthly reporting to the AWC.

Animal Identification/Information on Aquariums/Outside Pens

- Animal identification and handling must comply with the Standard Operating Procedure for Animal Handling and Identification.
- Aquarium cards should list the species, identification number, tank number, and (where applicable) experimental dates, medical treatments, and any special requirements.
- If it is possible to identify animals by physical appearance, this is preferable to identification by more invasive procedures. A digital image on induction is preferred.
- Charts on the doors of rooms must include contact details for researchers, animal numbers, project approval number, and finish date.

Animal Housing - Planning Ahead and Set Up

- All applications in which new aquaculture systems are to be established must mention the pre-conditioning of water and biofilters. In addition, applications must mention that all tanks, water recirculation equipment, and facilities, should be tested prior to arrival of aquatic animals.
- Animal Facility staff should be notified at least one week before any animals arrive or leave.
- Housing design must allow for routine monitoring of animal health. Glass and clear plastic tanks for shelving style housing (no black tubs). Large scale fish holding tanks must be light coloured and/or have a viewing window and/or have fish housed in floating cages and/or a periscope, so that fish may be observed as per monitoring check list criteria.
- If your species requires submersible pumps within the aquaria, be aware that anemones, small fish, and invertebrates can get sucked in to the filter, which seizes the pump, fouling the system, and in the case of anemones, releasing toxins.
- Tank outlets may require a mesh covering to stop tank inhabitants escaping. Do not use flyscreen wire as it will rust. Plastic and Silicone meshes work well but can block up with detritus and cause the tank to overflow. They must be cleaned off regularly and a mesh size chosen that allows maximum water flow, but small enough that animals cannot gain access.
- Numbers to be held must take into consideration that waters oxygen carrying capacity decreases as temperature increases.
- A system generally will be able to accommodate a greater total weight of large fish than small (in regards to available oxygen).
- Fish in floating bags for acclimation must be provided with supplementary air and a coloured “sticky” note attached to the door of the room. All animal movements must also be recorded in the Communication Book in the hallway.

Things to consider:

- Have you sourced or budgeted for Water testing equipment?
  - Eg. Oxygen meter, pH/salinity/temperature meter, ammonia, and nitrite and nitrate test kits?
- Food?
- Specialised aquariums/housing? Will you need heaters/chillers to vary water temperature?
- Will you need to grow and maintain live feed, such as artemia, rotifers, and algae?
- Do you have containers to grow them in, and chemical nutrients to maintain the algae?

Feeding/Cleaning/Checking

- All animals are checked daily to ensure they are healthy and have a clean water supply and shelter. Project owners are expected to maintain their area and tanks, and feed animals while they are under experimental conditions.
- At the termination of your project, all tanks must be cleaned with either 70% or 99% ethanol, bleach, or sodium hypochlorite. (Bleach and sodium hypochlorite must be neutralised with sodium thiosulphate at a ratio of 1:3 (bleach:thiosulphate)).
- When planning your feeding and cleaning routine, keep in mind that oxygen consumption is directly related to the amount of food fed. Uneaten food reduces oxygen carrying capacity through BOD (biochemical oxygen demand). BOD measures the amount of organic compounds in water.

Hygiene

- Items requiring cleaning must be cleaned in the wash room, not left in the animal rooms (with the exception of tanks). Rooms are to be kept clean, tidy, and free of clutter at all times.
- Wear gloves when in contact with animals/tanks when possible, and always wash hands thoroughly, using the antiseptic hand wash in preparation room and washroom.
- Each room has its own equipment to avoid cross contamination. Please don't introduce or move equipment between areas.
- Do not use detergent style cleaners in the aquatic rooms. Ethanol and Bleach are the acceptable cleaners.
- Please wash hands before undertaking work in the facility, and again prior to leaving.

Monitoring

- Monitoring templates are available via the AWC website, or by contacting the Animal Ethics Officer.
- Below is an example of a monitoring sheet that can be used during both Quarantine and ongoing care (see the AWC website for current template versions).

Chief Investigator:
Department:
Project
Title:
Project Number:
Species Fish
Strain:

Status: **Acclimatization period**

Day		1	2	3	4	5	6	7	8	9	#	#	#
Water quality:	pH												
	dissolved oxygen												
	nitrite												
	ammonia												
	temperature												
	turbidity/salinity												
Abnormal body conformation:													
Abnormal skin condition:													
Abnormal gill condition:													
Abnormal activity:													
Abnormal energetics:													
Death:													

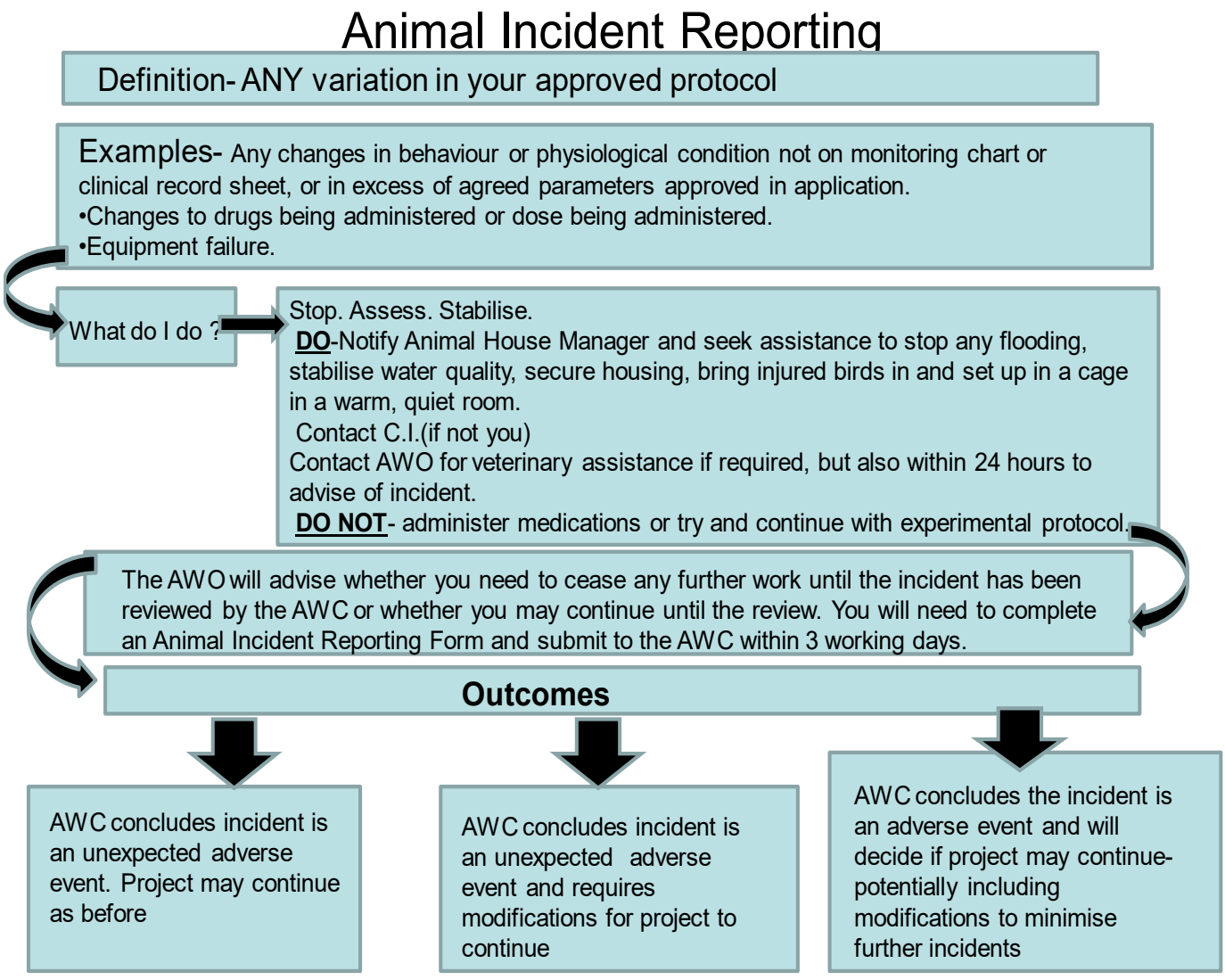
A "+" indicating that an anomaly has been detected requires the keeping of an animal record sheet

Point(s) of intervention:
Action(s) to be taken:
Comment:

- Daily water quality checking is required during quarantine, and a minimum of once weekly during ongoing holding. Monitoring records are required as part of your approval from the AWC.

Health

- A key factor when working with animals is to keep their environment as stress free as possible. Many health issues are triggered by stress and a weakened immune system. Healthy animals can carry various microorganisms in their system/on the body without becoming ill, but a stressful environment (poor water quality, lack of oxygen, incorrect temperatures, housing, poor handling techniques, etc) can all make them much more susceptible to disease. It is important before you start your work that you have appropriate housing arranged and an understanding of how to maintain your animals in a healthy condition.



All unexpected deaths/ sick animals require the following procedure:

1. Report to Animal Facility Manager and Animal Welfare Officer as soon as possible, but within 24 hours.

2. Send an Unexpected Adverse Event Report to animal.welfare@flinders.edu.au
3. Arrange a necropsy with the Animal Facility Manager or AWO.
4. Unexpected Adverse Event Forms are available on the Animal Welfare Committee (AWC) website.

- This form is not exclusively for reporting unexpected sickness/deaths, and should also be used to report any unexpected incidents (e.g. equipment failure, etc).
- Carcasses are kept on request, or are placed in the blue carcass bin in the level 1 room 130 freezer, Biological Sciences Building.
- Sick animals will not be available for research work until they have fully recovered.
- Animals may only be euthanised by trained staff, and researchers and must adhere to the method stated in the research application approved by the Animal Welfare Committee.
- Although the Animal Facility staff carry out daily monitoring of all animals held in the facility, it is also the responsibility of the researcher to ensure adequate monitoring of their animals wellbeing (Chapter 2.4 - *Australian Code for the care and use of animals for scientific purposes, 8th edn, 2013*).

Care of Animals During Emergencies

- The Facility has a back-up generator for power outages, so there will rarely be a total facility power failure. If power is out for a specific room or piece of equipment, it is more likely a fuse/safety switch has tripped, which maintenance can rectify and identify the cause of. Generally, it will be a heat lamp or item of plug-in electrical equipment (pumps, powerheads, etc). There are replacements items for most equipment in the facility storerooms.
- Emergency euthanasia should not be undertaken unless all reasonable steps to contact the Chief Investigator, Animal Welfare Officer, and Animal Facility Manager have been unsuccessful and then, only by experienced staff.

Flooding in room:

1. Notify Animal Facility staff immediately if you do not have experience in fixing such problems.
   - Mobile numbers listed on window next to office. Leave a voicemail message if they don't answer.
2. If staff member not present/ cannot immediately be reached on phone:
   - Walk through room and observe pipe inlets and outlets, looking for blockages to outlets or inlets that have been knocked out of tank. Look for

leaking fittings and water level in tanks (if overflowing then an outlet is likely blocked).

3. Turn off pump at switch on wall, near the sink or individual tank tap, to stop water flow while you fix the leak (if possible).

4. Contact details for researcher are listed on the door to the room. Attempt to contact them for further advice if Animal Facility staff can't be reached.

5. If researchers and Animal Facility staff cannot be reached, the phone number for the Animal Welfare Officer is also listed on the window next to the Animal Facility Office Door. The AWO can advise on whether immediate action is required or whether animals can be comfortably maintained without recirculating water for the time being.

6. Do not attempt to fix the source of the flooding unless you are very familiar with the animals housing condition, the project they are attached to, and the approved application from the Animal Welfare Committee (this includes the water temperature they are kept in, the salinity levels, pH, etc). The outside water supply that refills the tanks can vary by as much as +/- 15°C from inside. Rapidly refilling a system with water outside the animals usual parameters can result in shock, death, and secondary infections. Affecting the experimental protocol may also mean having to start the work again, more animals, more time, etc.

7. If you are confident as to the source of the flooding (often a blocked tank outlet or loose pipe) remove the blockage.

8. If you understand the recirculating system, and there is enough water in the sump (at least 1/3 to ½ full), you can turn the pump back on.

9. If there isn't enough water in the sump, do not refill it unless you know the correct water parameters and are able to provide them (unless otherwise directed by the Animal Welfare Officer/Animal Facility Manager on the balance that recirculating water is a higher priority than matching water parameters).

10. Once sump is refilled, you may switch the pump back on. If leaking/flooding appears to have stopped, it can be left on. Leave a note on door chart (permanent textas in drawers in hallway) and the blue folder in the hallway (with the appropriate room number on its cover) indicating action taken.

11. If you can determine a cause to do with power or plumbing that requires Maintenance to urgently repair, contact them on **(08) 8201 2177 (call Security on (08) 8201 2880 if out of normal business hours).**

12. Once situation is stabilised, commence Unexpected Adverse Event Reporting Procedure.

Safety

- All work undertaken must comply with Safe and Standard Operating Procedures.
- All electrical equipment must be electrically safety tested and tagged before use, and must not be introduced into areas without clearance.
- All injuries and incidents must be reported to Animal Facility Staff and the OH&S Manager.
- Any chemicals and plant equipment brought into the Facility must have been risk assessed and documentation available.
- Do not recap syringes; place them in the sharps bin provided.
- Shoes must be worn at all times in the facility (not thongs).
- Do not allow access to anyone that is not directly involved (and authorised) in undertaking research on the animals held, including family and friends.
- Floors are to be kept clear to avoid creating tripping hazards. Equipment must be stored on shelves.
- Do not prop open external doors as it compromises the security of the facility.

SOP Review

This SOP currently applies to the animals housed in the College of Science and Engineering Animal Facility and field sites. This SOP will be reviewed 3 yearly, but also updated more frequently as policies, techniques and animal care requirements change.

Any questions regarding the above guidelines and any technical advice/ assistance required can be directed to Animal Facility Manager.

Position	Name	Contact Details
Animal Facility Manager	Leslie Morrison	X 12196 Office in Animal Facility Leslie.morrison@flinders.edu.au
Animal Welfare Officer	Lewis Vaughan	0450 424 143 awo@flinders.edu.au

Useful References:

- http://www.nhmrc.gov.au
- http://www.adelaide.edu.au/ANZCCART/
- http://www.environment.sa.gov.au
- http://www.flinders.edu.au/research/researcher-support/ebi/animal-ethics/animal-ethics_home.cfm **(Link for Animal Incident Report forms, Teaching and Research Application Forms and all animal welfare related matters)**
- Ross, L. G. and Ross, B., 2008. Anaesthetic and Sedative Techniques for Aquatic Animals, *Blackwell Publishing* (3rd Edition)
- Ostrander, G., Bullock, G. and Bunton, T., 2000. The Laboratory Fish, *Academic Press*