Code of practice for injured, sick and orphaned monotremes

Department of Climate Change,
Energy, the Environment and Water

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

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Preface

The *Code of practice for injured, sick and orphaned monotremes* (the code) is intended for those authorised to rescue, rehabilitate and release echidnas and platypuses. The code has been developed to ensure the welfare needs of these animals are met and the conservation benefits stemming from their rehabilitation and release are optimised. It also aims to ensure that risks to the health and safety of volunteers rescuing and caring for these animals are reduced and easily managed.

Compliance with the code does not remove the need to abide by the requirements of the:

- *Prevention of Cruelty to Animals Act 1979*
- *Poisons and Therapeutic Goods Act 1966*
- *Veterinary Practice Act 2003*
- *Animal Research Act 1985*
- *Local Government Act 1993*
- *Firearms Act 1996*

or any other relevant laws and regulations.

Compliance with the standards in the code is a condition of a biodiversity conservation licence (BCL) to rehabilitate and release injured, sick and orphaned protected animals, issued under the NSW *Biodiversity Conservation Act 2016* (BC Act). A person who contravenes a condition of a BCL is guilty of an offence under s 2.14 (4) of the BC Act.

The code is neither a complete manual on animal rehabilitation care nor a static document and must be implemented by a person trained in accordance with the *Monotreme rehabilitation training standards for the wildlife rehabilitation sector*. It will be periodically reviewed to incorporate new knowledge of animal physiology and behaviour, technological advances, developments in standards of animal welfare, and changing community attitudes and expectations about the humane treatment of monotremes. The Department of Climate Change, Energy, the Environment and Water (the department) will consult with licence holders regarding potential changes to the code and give written notice when the code is superseded.

1. Introduction

This code sets standards for the care and housing of a monotreme that is incapable of fending for itself in its natural habitat. It refers to the 2 species from the order Monotremata that have been recorded in New South Wales: the short-beaked echidna (*Tachyglossus aculeatus*) and the platypus (*Ornithorhynchus anatinus*). Neither species has been listed as threatened in New South Wales or under the *Environment Protection and Biodiversity Conservation Act 1999*. The platypus is listed on the International Union for Conservation of Nature (IUCN) Red List as near-threatened, with populations decreasing.

This code comprises both enforceable provisions and guidelines. Enforceable provisions are identified by the word 'Standards' and they must be followed.

1.1 Principles

The development of the code has been guided by 4 key principles which apply to all aspects of monotreme rescue, rehabilitation and release:

Prioritise the welfare of monotremes

The main objective of wildlife rehabilitation is to relieve suffering in injured, sick or orphaned wildlife. Although the rehabilitation and release of monotremes to the wild is the primary objective, it must not be pursued to the preserve life of the animal at all costs or to achieve broader conservation outcomes where the animal is subject to unreasonable and unjustifiable suffering.

Avoid harm to wild monotremes and other wildlife communities

In wildlife rehabilitation there is a risk of adverse ecological outcomes. The inappropriate release of animals can have significant detrimental effects on the local ecosystem and wildlife communities. At all stages of wildlife rehabilitation, the potential adverse ecological outcomes must be considered and conservation benefits for monotreme populations maximised.

Minimise the risks to human health and safety

There are many risks in all aspects of rehabilitation, including both personal injury and disease, requiring consideration to ensure preventative measures are in place. All personnel involved in rescue, rehabilitation and release of monotremes must understand practical health and safety measures such as undertaking a risk assessment, using personal protective equipment and delaying action to ensure safety measures are in place to protect their health and safety.

Optimise capacity to care

Wildlife rehabilitators must ensure they have the capacity to provide for the essential needs of monotremes undergoing rehabilitation, and the resources to adequately prepare the monotreme for release back into the wild. When the wildlife rehabilitator's

capacity to care is exceeded, unacceptable standards of care or welfare may result. Wildlife rehabilitators must be mindful of their capacity to care, particularly when there is an influx of wildlife requiring care due to major incidents, significant weather events or disease outbreak.

When the capacity to care is exceeded, there are 3 acceptable management options:

- refer the monotreme to another licensed wildlife rehabilitator with a current capacity to care for the animal
- increase the capacity to care by increasing or pooling resources
- lower the euthanasia threshold in combination with early-stage triage of newly rescued animals and proper veterinary assessment and prognosis of monotremes in care.
- Lowering the standards of care such that they are not consistent with this code is not an acceptable response to exceeding the capacity to care. In circumstances that involve major catastrophic events and where capacity to care is exceeded, lowering the threshold for euthanasia is a more appropriate response than not rescuing animals in distress.

1.2 Interpretations

Objectives

‘Objectives’ are the intended outcomes for each section of this code.

Standards

‘Standards’ describe the mandatory specific actions needed to achieve acceptable animal welfare levels. These are the minimum standards that must be met. They are identified in the text by the heading ‘Standards’ and use the word ’must’.

Guidelines

‘Guidelines’ describe the agreed best practice following consideration of scientific information and accumulated experience. They also reflect society’s values and expectations regarding the care of animals. A guideline is usually a higher standard of care than minimum standards, except where the standard is best practice.

Guidelines will be particularly appropriate where it is desirable to promote or encourage better care for animals than is provided by the minimum standards. Guidelines are also appropriate where it is difficult to determine an assessable standard. Guidelines are identified in the text by the heading ‘Guidelines’ and use the word ’should’.

Notes

Where appropriate, notes describe practical procedures to achieve the minimum standards and guidelines. They may also refer to relevant legislation.

1.3 Definitions

In this code:

Barrier nursing refers to animal care protocols used to provide complete isolation of a patient to minimise the risk of cross-contamination between patients and from patients to the wildlife rehabilitator responsible for their care. It includes the physical separation of patients, avoiding sharing tools and furniture equipment between animals, wearing personal protective equipment such as masks, eye protection, gloves, gowns, aprons, overshoes and using infection control procedures such as equipment sterilisation and regular use of disinfectant.

Burrow is a hole dug by an echidna or a platypus, used as a dwelling.

Burrow young are milk-drinking echidnas and platypuses that live predominantly in a burrow (see Appendices A and C life stages).

Echidna refers to a short-beaked echidna *Tachyglossus aculeatus*.

Experienced echidna rehabilitator means someone who has extensive knowledge of current rehabilitation techniques gained through training courses and years of successfully rehabilitating and releasing echidnas.

Experienced platypus rehabilitator means someone who has extensive knowledge of current rehabilitation techniques gained through training courses and years of successfully rehabilitating and releasing platypuses.

Monotreme is an animal of the order Monotremata and refers to the short-beaked echidna and platypus.

Park means a national park, historic site, state conservation area, regional park, nature reserve, karst conservation reserve or Aboriginal area, or any land acquired by the Minister under the NSW *National Parks and Wildlife Act 1974*.

Pseudo pouch refers to the contracted stomach muscles of a male or female echidna, which can resemble a temporary pouch.

Pouch young are echidna puggles that are milk-dependent and live in the temporary pouch of their mother (see Appendix A life stages).

Pouch young carrying period refers to the time of year that female echidna are most likely to be carrying pouch young.

Puggle is a young echidna or platypus that is dependent on its mother for its nutrition. This includes both pouch young echidnas and burrow young echidnas and platypuses.

Protected animal means any amphibian, reptile, bird or mammal (except dingos) listed or referred to in Schedule 5 of the BC Act that is native to Australia or that periodically or occasionally migrates to Australia (including their eggs and young).

Recovery, when referring to an individual, means a return to a functional condition after an injury or illness. This includes the natural ability of an animal to feed, interact, move, and evade risks and hazards in a wild situation.

Rehabilitation care plan means developing a plan for the rehabilitation and care of an animal that includes monitoring, feeding, treatment, cleaning and appropriate housing.

Rescuers are first responders authorised by a wildlife rehabilitation provider to assist, pick up and transport an injured sick and orphaned monotreme unable to fend for itself.

Spur is an appendage on the medial (inner) side of the hind ankles of all male platypuses, young female platypuses, juvenile echidnas, and adult male and some female echidnas. In male platypuses it is attached to a venom-secreting gland.

Species coordinator is an experienced wildlife rehabilitator nominated by a group to liaise and advise volunteers on the rehabilitation of a particular species or group (e.g. echidnas, koalas, macropods). Species coordinators should be people who are skilled in applying the code and have a role in monitoring volunteers, distributing rescued animals to volunteers and liaising with local veterinary hospitals.

Temporary pouch refers to the two fleshy folds that create a habitable pocket for egg and pouch young on the belly of a female echidna, during the pouch young carrying period.

Torpor is an energy-saving mechanism during which the animal lowers body temperature, respiration, heart rate and metabolism. Torpor states are seasonal, with duration and depth varying considerably according to geographic location, weather, food availability and sex. It can also occur as a response to stress or trauma, and has been documented in extreme weather events such as bushfires

Wildlife rehabilitator means someone who is individually licensed, or is authorised by a licensed wildlife rehabilitation provider, to rehabilitate and release protected animals.

Wildlife rehabilitation means the temporary care of an injured, sick or orphaned protected animal with the aim of successfully releasing it back into its natural habitat.

Wildlife rehabilitation provider means an incorporated wildlife rehabilitation group, central facility, animal display establishment or individual that is licensed by the department under the BC Act to rehabilitate and release protected animals.

Zoonoses are diseases that can be transmitted from animals to humans.

2. Case assessment

2.1 Assessing monotremes

Objective

Assess a monotreme to determine the type of intervention required. The primary objective of rehabilitation is the successful reintegration of the animal back into the wild population, and all decisions are in pursuit of this goal. This will mean that some monotremes may benefit from rehabilitation whereas others will need to be euthanased.

Standards

2.1.1 The decision tree in Figure 1 must be followed when determining how to respond to a monotreme encounter.

2.1.2 Rescuers must arrange for an echidna to be assessed by an experienced echidna rehabilitator or a veterinarian within 24 hours of rescue to ensure accurate diagnosis and prompt treatment or euthanasia. If this is not possible due to the remoteness of the location, expert advice must be sought via phone, video conference etc.

2.1.3 The rehabilitation of platypuses is difficult and complex and must only be undertaken by rehabilitators who are experienced with this species and have suitable enclosures. Wildlife rehabilitation providers must:

- arrange for a platypus to be assessed by a wildlife veterinarian, within 24 hours of rescue to ensure accurate diagnosis and prompt treatment or euthanasia. If this is not possible due to the remoteness of the location, advice from a veterinarian experienced with platypuses must be sought via phone or video conference
- transfer the platypus to a facility that can provide specialised care (Taronga Wildlife Hospital Sydney, Taronga Wildlife Hospital Dubbo, Currumbin Wildlife Hospital) within 24 hours of rescue, unless the animal is to be released within this timeframe as directed by a veterinarian with platypus experience.

Notes

An animal ‘creating a nuisance for the public’ generally refers to an animal that has entered a person’s house or represents a risk to human health. It does not include an animal defending its territory or exhibiting other normal behaviour.

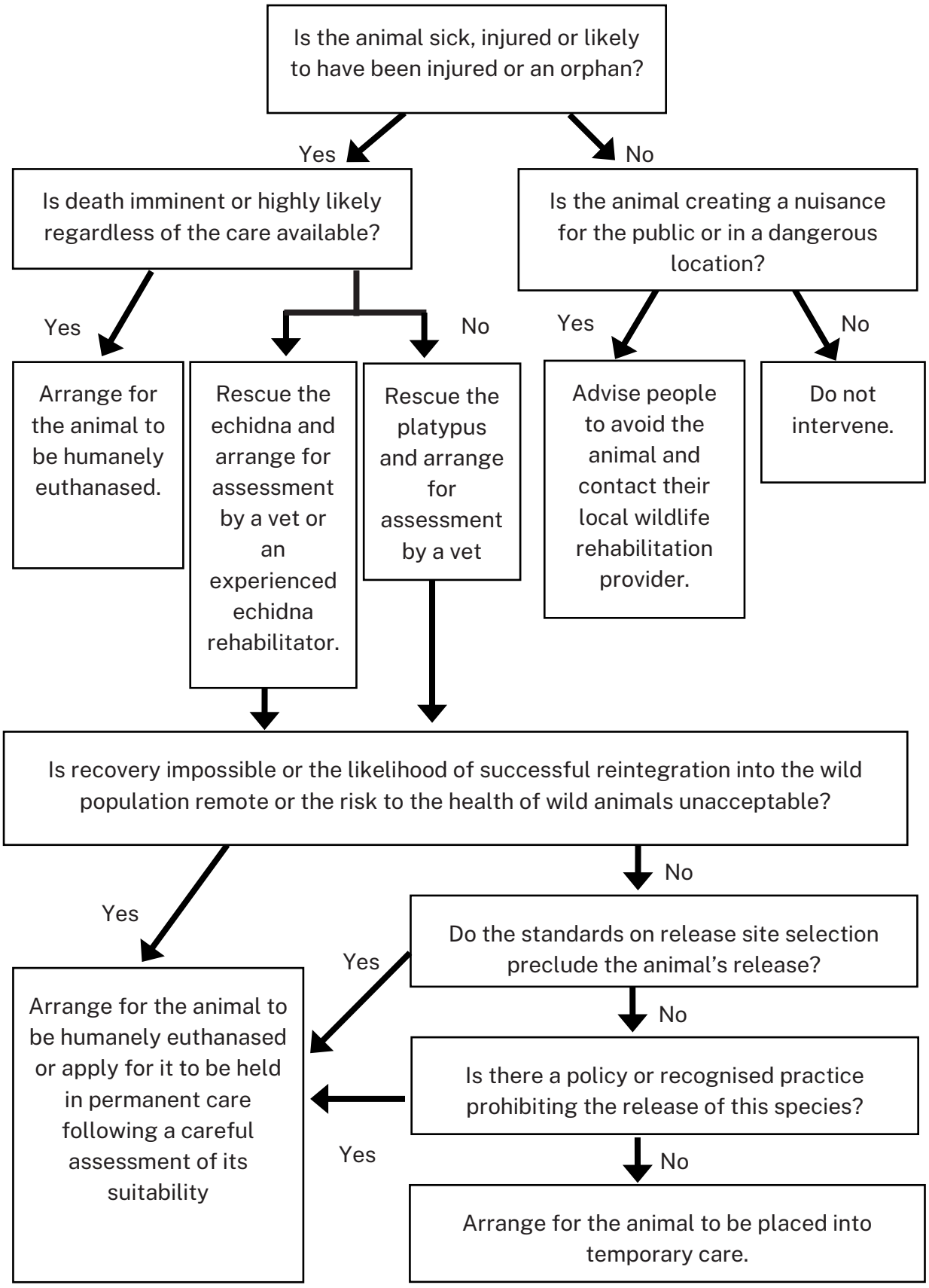

Figure 1 **Decision tree for course of action when a monotreme is encountered**

3. Rescue

3.1 Rescuing monotremes

Objective

Conduct a monotreme rescue to minimise further stress and injury to the animal.

Standards

3.1.1 Before a rescue attempt, the rescuer must assess the risks to the monotreme from environmental hazards and from capture.

3.1.2 Before a rescue attempt, the rescuer must assess the risks to themselves and members of the public.

3.1.3 Rescuers must not move a healthy, independent monotreme unless it is at immediate risk of injury – for example, animal is on a road, roundabout, trapped inside a house or yard with a dog present and no escape.

3.1.4 Rescuers must only attempt to rescue a monotreme when a sufficient number of trained personnel are involved for the rescue to be undertaken safely.

3.1.5 Monotremes will hide injury and pain and rescuers must take this into consideration when designing their rescue plan.

3.1.6 Rescuers must take steps to protect the koala from additional stressors during rescue, such as onlookers, loud noises, vibrations, other animals and extremes of temperature.

3.1.7 Rescuers must use suitable work health and safety techniques to minimise the risk of injury to the rescuer. For example:

- wearing personal protective equipment (e.g. gloves and long sleeves) and using a barrier (e.g. placing a towel over an echidna)
- applying first aid to injuries resulting from echidna spines to prevent infection
- staying clear of male platypus spurs as the improper handling of a male platypus can result in envenomation
- seeking immediate medical assistance for envenomation by a platypus spur
- seeking professional help when necessary (e.g. State Emergency Services in flood waters).

3.1.8 Rescuers must employ the correct rescue equipment for the location, size, condition and species, and be trained in its use (see Section 11 ‘Training’).

3.1.9 The following methods and equipment must not be used to capture an echidna:

- pulling or lifting by its limbs
- a shovel used to dig under the animal or contact it in any way

- an implement used to leverage the animal from underneath
- traps
- excessive force
- any technique that risks damage to the beak.

3.1.10 Traps or nets (other than a scoop net) must not be used to capture a platypus.

3.1.11 To avoid envenomation, adult male platypuses or a platypus of unknown sex must be:

- picked up by grasping the dorsal (top, furred side) of the tail
- never supported or held on the ventral side (underside) of their body
- carried by the top of the bag and held away from the body when in a bag (e.g. pillowcase tied off at one end).

3.1.12 If multiple monotremes are rescued (e.g. on a fire ground), the containers in which they are placed must be labelled with the unique ID number, capture location, date and rescuer's name.

3.1.13 In the event of a wildlife emergency, approval to move a healthy monotreme must be sought from the Wildlife Licensing Team at wildlife.licensing@environment.nsw.gov.au.

3.1.14 Care must be taken when rescuing adult echidnas during the pouch young carrying period, as the animal may be carrying an egg or puggle. They must be monitored closely while being handled to ensure that any egg or puggle is not dislodged from the pouch.

Guidelines

3.1.15 If relocating an echidna, it should be released facing the same direction it was travelling.

3.1.16 If a platypus is observed swimming in saltwater, it should be rescued and assessed for rehabilitation as platypuses live in freshwater.

Notes

Once lifted, placing an echidna so its underside is draped over your forearm will inhibit curling.

4. Transport

Objective

Minimise further stress and injury to a monotreme during transport. This section applies to all movements of monotremes including from the point of rescue to a veterinary surgery, between rehabilitation facilities and to the release site.

Standards

4.1.1 Transport methods and container sizes must be appropriate for the species, size and condition of the monotreme.

4.1.2 Transport containers must be designed and set up to:

- prevent injuries to the monotreme
- prevent the animal from escaping.

4.1.3 All monotreme transport containers must:

- have floors covered with a dry, tangle free, non-slip, non-ingestible surface (e.g. towel or sheet)
- be constructed from a non-porous material that can be easily cleaned and disinfected (e.g. plastic)
- not be placed in direct sunlight
- be well ventilated so air can circulate around the animal. For example,
  - ventilation holes in the lid for echidnas
  - ventilation holes in the secure containers holding pouches for echidna puggles or pillowcases for platypuses
- be secured to ensure stability and prevent movement.

4.1.4 Echidna transport containers must:

- be smooth-sided
- be deep enough that the echidna can't reach the top when standing on its hind legs or alternatively have a very robust and secure lid
- be solid, heavy duty and unable to be destroyed by digging or climbing
- have no wire or slits (either plastic or metal), crevices or ventilation holes within reach of the echidna as these can cause damage to their beak and nails
- not be constructed of cardboard or styrofoam
- not be a soft crate.

4.1.5 Orphaned pouch young echidna puggles must be transported in an artificial pouch or on soft fabric padding, then placed within a solid container.

4.1.6 A platypus must be placed in a pillowcase or cotton bag that is:

- large enough to allow the animal to stretch to its full length

- tightly secured (e.g. tied in a knot or secured with a cable tie or rubber band)
- placed inside a hard-shelled carrier or box with a secure lid.

4.1.7 If artificial warmth is required (echidna puggles will only need in extreme cold), the heat source must be placed on the outside of the pouch, padding, pillowcase or cotton bag to prevent the animal from coming into direct contact with it.

4.1.8 Platypus transport containers must have a clearly visible warning label that says 'DANGER – venomous platypus' if carrying a male platypus or an adult platypus of unknown sex.

4.1.9 Platypuses must not be transported in water.

4.1.10 Each monotreme must be transported in its own container unless they are a mother and dependent puggle.

4.1.11 Monotremes are sensitive to high temperatures. Monotreme transport containers must be kept at a consistent ambient temperature that is appropriate for the species, age and condition of the monotreme:

- a range of 17 to 25 °C for echidnas, with the higher temperature only for northern NSW
- pouch young puggle echidnas 24 to 25 °C
- burrow young puggle echidnas 20 to 25 °C
- a range of 15 to 25 °C for adult platypus.

4.1.12 The ambient temperature and condition of the monotreme must be monitored during transport.

4.1.13 Monotremes must not be transported:

- in the back of an uncovered utility vehicle
- in a car boot that is separate from the main cabin and which is not temperature controlled
- on the rescuer's lap
- on the body or under the clothing of a rescuer.

4.1.14 Monotremes must not be transported in a car with loud noise, cigarette smoke, strong smells or domestic animals.

4.1.15 The use of medication to facilitate transport must only be undertaken with consultation and approval by a veterinarian.

4.1.16 Transport of the monotreme must be undertaken in the shortest possible time.

Guidelines

4.1.17 Monotremes should not be fed during transport and water should be offered if the trip is longer than 4 hours.

Note

- Monotremes are very prone to escape and can climb, dig and remove or break lids from transport containers, even when severely injured.
- A tall, solid plastic garbage bin (75 litres), with ventilation holes drilled in the lid or high enough that an echidna cannot reach them if standing on its hind legs is a suitable transport container for an adult echidna.

5. Euthanasia

5.1 When to euthanase

Objective

End a monotreme's life in situations where death is imminent, full recovery is impossible, the likelihood of successful reintegration into the wild population is remote, or the animal poses an unacceptable disease risk to other animals in the wild once released.

5.1.1 A monotreme must be euthanased without exception when:

- death is imminent or highly likely regardless of the treatment provided
- it is suffering from chronic, unrelievable pain or distress
- it is carrying an incurable disease that may pose a health risk to other wild animals
- its ability to consume food unaided is permanently impaired (e.g. due to a missing or irreparable injury to the beak, bill, jaw or tongue)
- an experienced wildlife veterinarian makes that recommendation
- it is at a stage of development where it is unlikely to be hand-reared to the point where it can be released
- it has significant burns to the face, digits, nail beds, tail, feet, underbelly and in echidnas panniculus carnosus muscle, which is necessary for spine movement and curling.
- it has fractures that are unlikely to heal.

5.1.2 A monotreme must be euthanased (unless the department has granted permission to hold it in permanent care) when:

- its ability to locomote normally (i.e. walk, dig, climb or swim) is permanently impaired
- its ability to successfully forage is permanently impaired (e.g. the ability to dig and tear apart logs)
- its ability to sense its environment (i.e. see, hear, smell, taste or feel) is permanently impaired, for example, due to a missing or injured organ (e.g. eye, beak or bill).

In certain circumstances, the department may grant permission to hold such animals in permanent care or arrange placement with an authorised animal exhibitor licensed by the NSW Department of Primary Industries and Regional Development (DPIRD). See the *Rehabilitation of protected animals policy* for details.

5.2 How to euthanase

Objective

Induce death with minimal pain and distress to the monotreme.

Standards

5.2.1 A euthanasia method must be used which produces a rapid loss of consciousness immediately followed by death.

5.2.2 Death must be confirmed immediately following a euthanasia procedure and before disposal of the carcass. The absence of a heartbeat, respiration and the loss of corneal reflexes indicates death has occurred.

5.2.3 Acceptable methods for euthanasia of monotremes include:

- anaesthesia followed by an intravenous (preferred) or intracardiac injection of sodium pentobarbital. This must be performed by a veterinarian
- gunshot to the brain for monotremes over 150 g (only when moribund and not curling for echidnas)
- blunt force trauma to the base of the skull for echidnas <150 g and platypuses <3 kg.

5.2.4 The following euthanasia methods must not be used on monotremes:

- suffocation via drowning, strangulation or chest compression
- freezing or burning
- carbon dioxide or carbon monoxide in any form
- poisoning with household products
- air embolism
- exsanguination or decapitation
- electrocution or microwave irradiation
- chloroform or strychnine
- neuromuscular blocking agents.

5.2.5 Shooting must be undertaken by a licensed, skilled and experienced wildlife rehabilitation provider or an appropriate agency, such as the NSW National Parks and Wildlife Service (NPWS), the Royal Society for the Prevention of Cruelty to Animals (RSPCA) or NSW Police Force.

Guidelines

5.2.6 Monotreme rehabilitators should arrange for a veterinarian to perform euthanasia.

5.2.7 A monotreme that requires euthanasia should not be exposed to additional stressors such as large numbers of onlookers, people touching it, loud noises or extremes of temperature.

Notes

For further information on appropriate euthanasia methods refer to:

- Australian Code for the Care and Use of Animals for Scientific Purposes (8th edition, NHMRC 2013)
- Australian Veterinary Association – Policy for Euthanasia of Injured Wildlife
- Department of Biodiversity Conservation and Attractions 2024 SC24-11 Euthanasia of animals under field conditions
- The *Firearms Act 1996*, which places restrictions on the licensing and use of firearms.
- The *Veterinary Practice Act 2003*, which places restrictions on the types of procedures non-veterinarians can perform on animals.
- The *Poisons and Therapeutic Goods Act 1966*, which places restrictions on the types of poisons people can possess.
- When in torpor, echidnas will significantly lower their heart rates (as low as 4 bpm) which will make confirming death difficult. Patience and time are required to confirm death.

5.3 Disposal of carcasses and animal waste

Objective

Dispose of waste so the risks of disease, contamination or envenomation are minimised.

Standards

5.3.1 Carcasses and organic waste suspected or confirmed to be contaminated with infectious disease or that have been exposed to chemicals (e.g. barbiturates) must either be incinerated (under Environmental Protection Agency licence), taken to a licensed waste facility or, if on private land, buried at a depth that will prevent scavengers from reaching them.

5.3.2 A monotreme that has died from disease or chemical means (e.g. barbiturate overdose) must not be fed to other animals.

5.3.3 If an unusual disease or mortality event is suspected, the wildlife rehabilitator must immediately contact their species coordinator to notify the Department of Primary Industries and Regional Development's 24-hour Emergency Animal Disease Hotline on 1800 675 888 (24 hours) for immediate assessment of emerging health threats.

Guidelines

5.3.4 If an unknown or unusual disease or process is suspected, a deceased monotreme should undergo a necropsy by a veterinarian.

5.3.5 Wildlife rehabilitators should make every effort to reduce the risk of contracting zoonoses such as *E. coli*, salmonella, leptospirosis (platypus only) and fungal infections by:

- implementing barrier nursing techniques (e.g. wearing personal protective equipment such as a mask, gloves and gown)
- ensuring they are vaccinated for tetanus.

5.3.6 The Australian Museum should be contacted for all platypus carcasses (even if decomposed) and for echidna carcasses that are in good condition and originating from west of the Great Dividing Range.

Note

Further information on carcass disposal can be found in the Department of Primary Industries fact sheet *Animal carcass disposal*, including particular information on the proper construction and location for a burial site, to protect the water table.

6. Care procedures

6.1 Assessment

Objective

Identify the severity of wounds, injuries or disease to determine the best course of action for a monotreme undergoing rehabilitation.

Standards

6.1.1 Upon admission a monotreme must be assessed based on its injuries and condition. For example:

- a veterinary assessment as soon as possible and no longer than 24 hours for echidnas with suspected major trauma (e.g. car strike, dog bite), damaged beak, respiratory distress (e.g. water inhalation, bushfire) or severe illness
- assessment by an experienced echidna rehabilitator or a veterinarian within 24 hours for all other echidnas. If this is not possible due to the remoteness of the location, phone or video conference must be used
- assessment by a wildlife veterinarian within 24 hours for all platypuses. If this is not possible due to the remoteness of the location, advice from a veterinarian experienced with platypuses must be sought (e.g. via phone or video conference).

6.1.2 Upon admission a monotreme must be weighed and the stage of development identified (see Appendices A, B and C).

6.1.3 Upon admission a monotreme must be checked for:

- beak or bill condition (e.g. distortion, swelling or wounds (observe alignment and tongue retraction in echidnas)
- demeanour (e.g. unresponsive to handling or human presence, reluctance to hide in an echidna)
- blood-tinged or unusual discharge from nostrils, ears, eyes or cloaca (clear bubbles from echidna nostrils are normal)
- respiration abnormalities (e.g. gurgling, wheezing, open-mouthed breathing, rapid, slow, exaggerated or noisy breathing effort)
- fractures (e.g. abnormal limb angles, flaccid and non-weight bearing limbs, asymmetry of the beak or bill, jaws or eyes, inability or reluctance to curl in echidnas)
- body condition (e.g. rounded, dome-shaped back profile, spongy front foot pads for echidnas; if the edges of the tail can be curled together and almost touch, this indicates ill health for a platypus)

- fur, skin and spine condition (e.g. platypuses: matted fur or lack of waterproofing (does not dry itself within 15 minutes); echidnas: hair loss, spine loss, dermatitis, melted or broken spines)
- digit and claw condition (e.g. torn or missing)
- neurological injuries (e.g. head tilt, uneven gait, twitching, circling, star gazing or imbalance)
- temperature stress (e.g. hyperthermia)
- reflexes (e.g. withdrawal reflex)
- injuries (e.g. puncture wounds or abrasions from a bite, lacerations from an entanglement)
- parasites (e.g. ticks)
- evidence of entanglement or fouling with chemicals or pollution
- diarrhoea or unusual faeces
- mobility (e.g. gait and posture)
- reproductive status for females (e.g. engorged mammary tissue indicating lactation, echidna temporary pouch).

6.1.4 Antibiotics must be given by or under the guidance of a veterinarian and with extreme caution due to the spread of antibiotic-resistant bacteria.

Guidelines

6.1.5 A veterinarian assessing a monotreme should be trained and experienced with the species.

Notes

- It is important to understand the normal physiology of monotremes, to be able to identify abnormalities. Monotreme assessment often relies heavily on the involvement of veterinarians to provide an accurate assessment and diagnosis.
- When in torpor, echidnas will significantly lower their heart rates (as low as 4 bpm) which will make confirmation of life difficult.
- It is difficult to identify signs of pain in a monotreme. Signs may include laying on one side, trembling, shaking or a reluctance to move normally (including swimming and in platypuses).

6.2 Monitoring

Objective

Determine the health of a monotreme undergoing rehabilitation so concerns can be promptly identified and managed. The type and frequency of monitoring will vary with the age or stage of development, type of injury or illness and required treatment.

Standards

6.2.1 Monitoring a monotreme in intensive or intermediate care must include visually:

- checking for injury, disease and evidence of parasites
- noting food and fluid intake
- noting frequency, quantity and appearance of scats and the frequency and appearance of urine.
- checking mobility and indications of activity
- looking for changes in behaviour – for example, signs of stress (e.g. pacing), signs of pain (trembling, shaking), echidnas entering torpor
- visually assessing body condition (e.g. platypus tail condition).

6.2.2 The water temperature in all platypus enclosures must be monitored daily to ensure it remains less than 27 °C.

6.2.3 Monotremes in intensive care must be monitored at least twice a day and weighed twice a week.

6.2.4 Monotremes in intermediate care must be monitored daily and weighed at least once a week.

6.2.5 A monotreme being prepared for release must be discreetly observed daily to determine if it is physically and behaviourally ready for release (see Section 9 ‘Suitability for release’).

6.2.6 Orphaned pouch young puggles must be monitored at least 3 times a day.

6.2.7 Milk-dependent puggles must be weighed before and after every feed.

6.2.8 Wildlife rehabilitators must monitor the ambient temperature within intensive and intermediate care enclosures at least twice a day to ensure appropriate temperatures are maintained. If electrical heat sources are used, these must be regulated by a thermostat and checked during monitoring.

6.2.9 Orphaned pouch young puggles must have the ambient temperature of their housing monitored (e.g. using a thermometer probe with an external display to ensure minimal disturbance) at least 4 times a day.

6.2.10 All monotremes must be weighed prior to release.

6.2.11 An echidna’s foot pads must be monitored for signs of foot rub, and if present they must be kept dry at all times to prevent maceration (secondary infection).

6.2.12 Monitoring must minimise disturbance and handling of the animal, to reduce stress and risk of humanisation.

Guidelines

6.2.13 Any significant weight loss or poor weight gain in a milk-dependent echidna puggle should be referred to a veterinarian.

Notes

- Monitoring is a holistic assessment of the animal and findings should not be viewed in isolation, but in combination.
- When injured or distressed, an echidna can lower its respiration rate, heart rate, body temperature and metabolism and enter torpor.
- Echidnas are vulnerable to coccidiosis and overburdens can result in foul-smelling diarrhoea (sometimes with blood), poor body condition and lethargy.
- Fungal and bacterial infection in echidna puggles may result in abnormal odours and can be confirmed by veterinary tests.

6.3 Controlling disease transmission between animals

Objective

Prevent the spread of diseases among monotremes undergoing rehabilitation. Stressed animals are more susceptible to infectious diseases.

Standards

6.3.1 Each newly arrived monotreme must be isolated in a separate area until its disease status can be determined by a veterinarian or rehabilitator who is experienced with the species.

6.3.2 Monotremes suspected or known to be carrying an infectious disease must be kept under strict quarantine conditions (e.g. an individual enclosure in a separate room) until no longer infectious and be cared for by rehabilitators implementing barrier nursing techniques (e.g. wearing personal protective equipment such as a mask, gloves and gown).

- Signs of disease include abnormal breathing sounds, dry flaky skin, unusual discharge from eyes, beak or cloaca, diarrhoea, loss of hair/spines, lethargy and weight loss.

6.3.3 Dedicated cleaning equipment, feeding equipment and bedding must be used for monotremes with a suspected or confirmed infectious disease. This equipment must not be shared.

6.3.4 All enclosures, transport containers, enclosure furniture, bedding, food and water containers must be disposed of or thoroughly cleaned and disinfected with an appropriate disinfectant (e.g. ‘F10’ which contains both antibacterial and antiviral properties) between each occupant.

6.3.5 Organic matter in intensive or intermediate housing must be disposed of after each animal.

6.3.6 Wildlife rehabilitators must use gloves or wash their hands thoroughly with soap or disinfectant and then rinse thoroughly, before and after handling each animal in care. If using gloves, a different pair must be used for each animal.

6.3.7 When handling multiple animals, rehabilitators must start with the healthiest and finish with the sickest to reduce the risks of disease transmission.

6.3.8 Wildlife rehabilitators must refrain from being too affectionate (e.g. kissing or cuddling) or placing animals inside their clothing as there is an increased risk of disease transmission.

6.3.9 Other species undergoing rehabilitation must not be kept in the same enclosure as a monotreme.

6.3.10 Water must not be shared between platypus enclosures unless the platypus were rescued from the same interconnected waterway.

6.3.11 If an unusual disease or mortality event is suspected, the wildlife rehabilitator must immediately contact their species coordinator to notify the Department of Primary Industries and Regional Development's 24-hour Emergency Animal Disease Hotline on 1800 675 888 for immediate assessment of emerging health threats.

Guidelines

6.3.12 Porous or dirt-floored echidna enclosures should be managed for disease transmission, particularly coccidiosis. For example:

- maintaining cleanliness and dryness
- resting pre-release enclosure between animals
- using coarse river sand as a substrate
- not placing hand-reared echidnas in pre-release enclosures with dirt floors
- undertaking faecal float testing.

6.3.13 Wildlife rehabilitators should make every effort to reduce the risk of contracting zoonoses such as *E. coli*, salmonella, leptospirosis and fungal infections by implementing barrier nursing techniques when necessary (e.g. wearing personal protective equipment such as a mask, gloves and gown).

6.3.14 Pest control for rats and mice is recommended for all rehabilitation facilities.

Notes

- If unwell, wildlife rehabilitators should seek medical advice and advise the doctor that they are caring for a sick animal and there is a possibility of having contracted a disease.
- It is recommended that pregnant or immunocompromised people do not handle or care for sick animals.

7. Rehabilitation care

7.1 Food and water

Objective

Ensure the monotreme has a feeding and watering regime that encourages rapid recovery, supports growth in juveniles and assists with maintaining foraging behaviour necessary for survival in the wild.

Standards

7.1.1 Clean, fresh drinking water must be always available and changed daily, except in the case of orphaned dependent young (see Standard 7.1.5).

7.1.2 Echidna water containers must be smooth-sided, non-porous and designed and positioned to minimise spillage and contamination while still allowing access (e.g. heavy, shallow bowl wider than 10 cm).

7.1.3 Monotremes must be provided with a balanced and complete diet that supports growth and development and is appropriate for the size, stage of development, mobility and physiological status of the animal. For example:

- adult echidnas must be offered a commercial echidna feed mix or a low-fat home-made mince mix
- home-made echidna mince mixes must be made following a recipe developed by an echidna diet specialist (e.g. Taronga Zoo, Currumbin Wildlife Sanctuary or Healesville Sanctuary)
- echidnas in intermediate and pre-release care must also be offered wild foraging foods (e.g. insect-laden logs, earthworms, active termite mounds) and be offered food and water in a way that will provide opportunity for enrichment and exercise (e.g. hidden from view and in different locations)
- echidna puggles must be offered a milk formula that is appropriate for their stage of development
- platypuses must be offered a variety of live invertebrates – for example, earthworms, glass shrimp, blackworms, maggots, mealworms, fly pupae (may be given frozen) or yabbies (in pre-release care only)
- platypuses in pre-release care must be offered yabbies first (as many as they can eat) and then the other live invertebrate options. They require yabbies weighing 50% of their body weight, as after feeding much of the exoskeleton will remain uneaten. This must be increased for a platypus that is underweight.

7.1.4 Water used to mix milk formula for puggles must be cool, pre-boiled water. At sea level, water needs to be at a rolling boil for at least one minute to sterilise it.

7.1.5 Extra hydration, when required by echidna puggles, must be offered separately from milk formula feeds and not by diluting the milk feed formula.

7.1.6 Echidna puggles must be offered warm milk in the palm of a very clean hand or in a soft (e.g. silicone), shallow container. Milk can be slowly added to the palm of the hand using a plastic pipette. Once the puggle is well-spined and feeding is established, milk can be offered in a bowl.

7.1.7 Platypuses must be offered invertebrate food in clean water. Food must be either presented in a bowl of water (for intensive care and juveniles) or placed directly into the swimming water within the enclosure (intermediate and pre-release care).

7.1.8 Platypus food must be weighed before feeding and left-over scraps weighed after to determine how much has been ingested.

7.1.9 Food in storage must not be accessible to pets, pests or wild animals and must be stored, frozen and thawed in a manner that prevents contamination and nutritional loss.

Guidelines

7.1.10 Food should be provided with minimal disturbance to the animal.

7.1.11 Platypuses should be offered food in high densities to encourage feeding.

7.1.12 Echidna puggles should be gradually transitioned to an adult diet, including wild natural foods before release.

7.1.13 Supplements should be avoided (unless recommended by a veterinarian) due to the risk of toxicities.

7.1.14 Echidnas (excluding puggles) should be offered roughage regularly (e.g. crushed termite mound, clean soil not from top layer of soil as this can be contaminated). This can be added to their food or offered separately in a bowl.

7.1.15 Upon entering rehabilitation, echidna puggles should be offered milk formula once or twice a day until feeding is established. Feeding should then follow the feeding guidelines below (relevant for commercially available echidna milk) but may be adjusted for the size, mobility and physiological status of the animal and its rate of formula digestion.

- 3- to 6-week-old echidna puggle: offer formula equivalent to 10% of body weight every 2 to 3 days
- 7- to 11-week-old echidna puggle: offer formula equivalent to 10 to 20% of body weight every 2 to 4 days
- 12-week-old echidna puggle or older: offer formula equivalent to 15 to 20% of body weight every 3 to 5 days.

7.1.16 Echidna puggles should be offered milk *formula* when they are exhibiting signs of hunger (e.g. increased activity, recent defecation) or if they have lost most of the weight they gained from the last feed (1 g = 1 mL).

7.1.17 When an echidna puggle is slow to feed, wildlife rehabilitators should consider:

- whether the animal has the correct body temperature (i.e. by warming it in the hand for 5 to 10 minutes or until it is active. If it is already active it is warm enough)
- whether the animal is dehydrated or constipated
- whether the animal still has undigested milk in its stomach
- ensuring the milk is warm
- ensuring the feeding environment is quiet
- seeking advice from an experienced echidna rehabilitator.

7.1.18 After feeding and cleaning (see Standard 7.2.8), the handling of echidna puggles should be minimised.

7.1.19 Platypuses should be offered food in high densities to encourage feeding.

Notes

A drowsy animal, well-rounded stomach and milk visible in stomach through non-pigmented skin are evidence that a previous feed is still being digested by an echidna puggle.

7.2 Hygiene

Objective

Maintain clean rehabilitation facilities so diseases are prevented or contained.

Standards

7.2.1 Faeces must be removed daily and disposed of so it cannot be consumed by other animals (e.g. in closed garbage or compost bins).

7.2.2 Monotremes must be cleaned if soiled with faeces, urine or uneaten food.

7.2.3 Artificial bedding must be changed daily or immediately if discovered soiled with spilt water, food, urine or faeces, then washed thoroughly and disinfected.

7.2.4 Food and drinking water containers must be cleaned daily. Cleaning involves the use of water, detergent and the physical removal of all residues.

7.2.5 Uneaten echidna food must not be left for more than 4 hours and must be disposed of so it cannot be consumed by other animals (e.g. in a closed garbage or compost bin).

7.2.6 Puggle feeding equipment must be sterilised before every feed.

7.2.7 Echidna puggles must be cleaned with warm water and dried thoroughly immediately after every feed.

7.2.8 Food that requires thawing must be thawed in a refrigerator (less than 4 °C) over 24 to 48 hours, and unused food must never be refrozen. Food that is thawed and

has been in a fridge for 24 hours and not fed to the monotreme must be discarded.

7.2.9 Wildlife rehabilitators must minimise disturbance to monotremes when cleaning.

7.2.10 Wildlife rehabilitators must wash their hands and clean all food preparation surfaces and equipment before feeding monotremes.

7.2.11 All enclosures, transport containers, artificial enclosure furniture, weighing equipment, food and water containers must be thoroughly cleaned and disinfected with an appropriate disinfectant (e.g. 'F10' which contains both antibacterial and antiviral properties) between each occupant.

7.2.12 Equipment used for cleaning animal enclosures, containers and furniture must be separate from equipment used domestically and linen must be washed separately from domestic clothes and linen.

7.2.13 Organic substrate in intensive or intermediate care housing must be replaced every 2 to 3 days and disposed of between occupants.

7.2.14 Water in intermediate and pre-release platypus enclosures must be maintained to a high standard of cleanliness and clarity with recirculating filtration.

7.2.15 Water in an intensive care enclosure platypus enclosure must be replaced when soiled (this ranges from 1 to 2 days).

7.3 General care

Objective

Ensure monotremes have a care regime that encourages rapid recovery, supports growth in juveniles, and assists with behaviours necessary for survival in the wild.

Standards

7.3.1 The rehabilitation of platypuses is difficult and highly specialised. Wildlife rehabilitation providers must transfer all platypuses to a facility (Taronga Wildlife Hospital Sydney, Taronga Wildlife Hospital Dubbo, Currumbin Wildlife Hospital) with suitable enclosures, knowledge and experience within 24 hours of rescue, unless the animal will be released within this timeframe or if following the directions of a veterinarian who is experienced with platypuses.

7.3.2 The rehabilitation of echidna puggles is difficult and must only be undertaken by experienced echidna rehabilitators. Experience can be gained by first rehabilitating adult echidnas, followed by juvenile echidnas and then working closely with someone who has experience rehabilitating echidna puggles.

7.3.3 Wildlife rehabilitation providers without the skills to rehabilitate echidna puggles must liaise with other groups and, if necessary, transfer the animals to another group that can provide the specialist care they need.

7.3.4 Monotreme puggles are prone to habituation to people. Social interactions with people must be minimised and natural behaviours must be allowed to develop.

7.3.5 Stress must be managed throughout the rehabilitation process including minimising contact with people, excessive noise, heat, smells and vibrations.

7.3.6 Each monotreme must have a rehabilitation care plan.

8. Housing

8.1 General requirements

Objective

Ensure a monotreme undergoing rehabilitation is housed in enclosures that keep it safe, secure and free from additional stress.

Standards

8.1.1 Housing must be escape-proof. For example:

- enclosures which have walls that cannot be climbed
- smooth-sided, plastic or outdoor enclosures with corrugated iron placed vertically and support posts on the outside for echidnas
- smooth-sided enclosures for platypuses
- enclosures must have high walls
- high enough to prevent the echidna from reaching the top when standing on its hind legs (e.g. indoor enclosures at least 54 cm high for an adult >1.5 kg, outdoor enclosures >90 cm high)
- at least 50 cm from the top of the water or soil to the top of the wall for a platypus
- the design and position of furnishings must not allow the animal to climb out (e.g. bowls, logs and furnishings are kept away from walls so they cannot be stacked or climbed on and used to escape, no overhanging branches)
- outdoor enclosures must have impenetrable bases or sides dug at least 50 cm into the ground
- platypus enclosures must have a roof.

8.1.2 Housing must be made safe for a monotreme to live in by excluding hazards that might harm it. For example:

- furnishings must be stable, and unable to fall and injure the animal
- enclosures must not contain toxic plants and must be constructed from non-toxic materials that can be easily cleaned and disinfected (see Section 7.2 ‘Hygiene’)
- enclosures must not contain sharp edges or crevices
- enclosures must not allow the animal to reach wire, mesh or slits
- outdoor enclosures must have drainage outlets
- water in platypus enclosures must adjoin a bank, burrow or other dry location to allow the animal to rest from swimming
- all water bodies must have a landing or platform on water level so the platypus can easily climb out

- water filter inlets must be shielded or inaccessible to prevent the platypus becoming trapped.

8.1.3 Tunnels in platypus enclosures must:

- be at least 6 cm high and 9 cm wide
- longer than 1 m and no longer than 4 m
- be constructed of materials that minimise abrasion to the feet, bill and fur
- have drainage holes to prevent moisture build-up
- not be at an incline or decline greater than 30 degrees
- not decline from water into rest box to prevent water getting into the rest box.

8.1.4 Housing must be designed and positioned to avoid extremes of temperature. For example:

- not exposed to prevailing winds and include areas that remain protected and in the shade
- outdoor echidna enclosures must provide a gradient of temperatures
- providing temperature control for shallow water in outdoor platypus enclosures that is at risk of overheating when exposed to direct sun so that it does not exceed 27 °C.

8.1.5 Housing must be designed and positioned to protect the monotreme from:

- the sight, sound and smell of domestic pets
- physical contact with domestic pets, wild animals, livestock, pests and predators.

8.1.6 Housing must be designed and positioned to minimise exposure to:

- strong vibrations
- noxious smells (e.g. wood smoke)
- loud noises (e.g. televisions, barking dogs)
- electrical currents (for platypuses).

8.1.7 Monotremes (excluding puggles) must experience a daily light–dark cycle.

8.1.8 Housing must be designed so rehabilitators can readily access the monotreme.

8.1.9 Mothers must not be housed away from their dependent puggles unless being treated for an injury that requires it or where it would be detrimental for them to be together.

8.1.10 Care must be taken for a monotreme with open wounds to limit the risk of flystrike – for example, covering the wound with a dressing, housing the monotreme inside until the wound has healed.

Guidelines

8.1.11 Only one monotreme should be housed in each enclosure, unless they are a mother and dependent puggle.

8.1.12 Echidna enclosures should be placed on the floor.

8.2 Intensive care housing

Objective

Facilitate monitoring, treatment, feeding and rehydration during the period immediately after coming into care and until the animal is stabilised.

Standards

8.2.1 Intensive care housing must provide sufficient space for the monotreme to turn around and move away from its urine and faeces.

8.2.2 Intensive care enclosures are for one animal (unless housing a mother and dependent puggle) and must have the following minimum dimensions (unless the animal's movement needs to be restricted):

- for echidnas weighing less than 1.5 kg, a minimum floor area of 0.35 m^2 (e.g. 0.7 m long x 0.5 m wide) and a minimum wall height of 0.54 m
- for echidnas weighing more than 1.5 kg, a minimum floor area of 0.55 m^2 (e.g. 1.1 m long x 0.5 m wide) and a minimum wall height of 0.6 m
- for platypuses, 1 m long x 0.7 m wide.

8.2.3 The ambient temperature in intensive care housing must provide a constant ambient temperature appropriate to the monotreme's stage of development and nature of its illness or injury:

- a range of 17 to 25 °C for echidnas, with the higher temperature only for northern NSW
- pouch young puggle echidnas: 24 to 25 °C
- burrow young puggle echidnas: 20 to 25 °C
- a range of 15 to 25 °C for adult platypuses.

8.2.4 If using electrical heat sources for adult echidnas, they must be kept on the outside of the enclosure and positioned at one end to allow sufficient opportunity for the animal to move away from the heat source. If the animal cannot physically move away due to its injuries, only ambient heating must be used.

8.2.5 If using an electrical heat source for a pouch young monotreme it must be placed on the outside of the pouch to prevent the puggle from coming into direct contact with it.

8.2.6 Electrical heat sources must be regulated by a thermostat.

8.2.7 Intensive care housing must be well ventilated without allowing excessive draughts.

8.2.8 Intensive care housing must be designed and positioned so that visual and auditory stimuli are minimised (e.g. an opaque tub placed in a quiet room).

8.2.9 Intensive care housing must be positioned to prevent vibration through the floor of the enclosure (e.g. placed on a foam mat or thick blanket, particularly when housed on timber or tiled floors).

8.2.10 Intensive care housing must contain a substrate. This substrate must:

- be soft fabric (e.g. towels or sheets)
- have no loose threads or rips
- be in sufficient quantity to cover the floor and, for echidnas, also allow the animal to use it as a shelter.

8.2.11 Orphaned pouch young echidna puggles must be housed in a small enclosure (e.g. 30 cm x 20 cm) with a pouch or bedding made from cotton or bamboo, with no threads or tears.

8.2.12 Platypus enclosures must contain a rest box (hide).

8.2.13 Platypuses in intensive care must not have constant access to swimming water due to the drowning risk and lack of waterproofing. If limited access to swimming water is provided it must be supervised

Guidelines

8.2.14 Healthy orphaned echidna puggles should be transferred from intensive care to intermediate care when they transition from the pouch young to burrow young stage (see Appendix A life stages).

8.3 Intermediate care housing

Objective

Provide a mobile monotreme with enough space to allow some physical activity and natural behaviours while enabling it to be readily caught for monitoring or treatment.

Standards

8.3.1 Intermediate care housing must provide sufficient space for the monotreme to move about freely while being conveniently sized for monitoring and capture.

8.3.2 Intermediate care enclosures are for one animal (unless housing a mother and dependent puggle) and must have the following minimum dimensions (unless the animal's movement needs to be restricted):

- for echidnas, a minimum floor area of 1.5 m^2 (e.g. 1.5 m long x 1 m wide) and minimum wall height of 0.6 m for indoor enclosures and 0.9 m for outdoor enclosures.

8.3.3 Intermediate housing must contain habitat elements that enable the monotreme to perform a range of natural behaviours. For example:

- sticks, leaves or rocks
- a hide or small log for echidnas to dig beneath
- a rest box with fabric or moss substrate for platypuses
- a shallow, accessible pool of water for platypuses to swim and feed
- an area for platypuses to preen and groom.

8.3.4 Echidna intermediate care housing must contain a substrate that is absorbent and easily cleaned or replaceable (e.g. soft towels, clean leaf litter or soil). Straw, wood shavings or sawdust must not be used.

8.3.5 If using electrical heat sources, they must be kept on the outside of the enclosure and positioned at one end to allow sufficient opportunity for the animal to move away from the heat source.

8.3.6 Electrical heat sources must be regulated by a thermostat.

Guidelines

8.3.7 Healthy orphaned burrow young echidna puggles should be transitioned to intermediate care housing.

8.3.8 Echidnas in intermediate care should be provided with an opportunity to bask, either with an area within an outdoor enclosure or by being taken outside in an escape-proof tub.

8.3.9 Outdoor echidna enclosures should have a variety of small shrubs to reduce stress.

Note

The risk of rub wounds on foot pads may be reduced by moving from an artificial substrate (e.g. towel) to a dry natural substrate (e.g. soil or leaf litter).

8.4 Pre-release housing

Objective

Give the monotreme the opportunity to regain its physical condition, acclimatise to current weather conditions, and practise natural behaviour. At this stage of rehabilitation, interactions between the monotreme and humans will be greatly reduced.

Standards

8.4.1 Monotreme pre-release housing must provide sufficient space for the animal to move about freely and express a range of natural behaviours.

8.4.2 Pre-release housing must have the following minimum dimensions (for one animal):

- for echidnas, a minimum floor area of 5.8 m^2 (e.g. 2.9 m long x 2 m wide) and a minimum wall height of 0.9 m
- for platypuses, contain a water body with a minimum surface area of 6 m^2 and depth of 0.4 m, plus dry areas to sleep and rest from swimming.

8.4.3 Pre-release housing must contain elements that mimic the natural environment to allow expression of natural behaviours and encourage activity. For example:

- echidna enclosures require a substrate of leaf litter, dirt or native ground cover; areas that allow digging (e.g. sand or loose soil); access to a variety of natural objects such as logs, bark, vegetation, soft rotting natural timber or natural mulch; and a hide or small log to dig beneath
- platypus enclosures require a water body that is deep enough for swimming and diving with ledges and landing area or platform at water's edge; an area to preen and groom; and a variety of natural objects such as logs, rocks, soil and plants.

8.4.4 Echidna pre-release housing must provide areas where the echidna can gain exposure to prevailing weather conditions and areas where it can shelter.

8.4.5 Pre-release housing must be designed and positioned so that exposure to humans is kept to the minimum required for monitoring, feeding and cleaning.

Guidelines

8.4.6 Platypus pre-release housing should have areas with soil banks to allow natural digging and burrow-making behaviours.

8.4.7 Outdoor echidna enclosures should have a variety of small shrubs to reduce stress.

Notes

Some commercial mulch products may contain added chemicals which are poisonous and must be avoided.

9. Suitability for release

9.1 Preparations for release

Objective

Ensure the monotreme is physically fit and has the appropriate survival skills before its release. Preparations for release will start at the time of rescue and continue throughout the rehabilitation process. Many species will gradually lose their survival skills in captivity, so it is vital their time in care is kept to a minimum.

Standards

9.1.1 A monotreme must not be released until it is physically ready. This status has been achieved when the animal has:

- recovered from any injury or disease (e.g. wounds healed, fully mobile, demonstrated use of beak or bill, breathing and has normal faeces)
- good body condition (e.g. tail condition in platypuses, rounded dome-shaped back profile, spongy front foot pads for echidnas)
- appropriate fitness levels (e.g. ability to dive and submerge in platypuses, strength and ability to dig down and avoid retrieval in echidnas)
  - skin and fur in good condition, including waterproofing in platypuses
  - has acclimatised to prevailing climatic conditions.

9.1.2 A monotreme must not be released until it is behaviourally ready. This status has been achieved when the animal:

- can find, recognise, catch and consume appropriate, naturally available food or food that mimics their natural diet (excluding echidnas that have been in care for less than a week)
- displays appropriate avoidance behaviours
- is not attracted to humans or to sights, sounds or smells that are specific to captivity (i.e. is not humanised or imprinted)
- can navigate effectively though the natural environment (e.g. avoids or climbs obstacles)
- is regularly active and echidnas not in torpor.

9.1.3 If hand-raised, puggles must have reached the age of weaning (see Appendices A and C).

9.1.4 A monotreme's readiness for release must be confirmed by:

- for echidnas, an experienced echidna rehabilitator or veterinarian
- for platypuses, a veterinarian experienced with platypus.

9.1.5 In cases where an animal is determined to be non-releasable, the wildlife rehabilitation provider must:

- consider euthanasia (see Section 5 ‘Euthanasia’).
- if euthanasia is not considered appropriate, consider permanent care. See the Wildlife Rehabilitation Policy for information and contact the Wildlife Team to apply at wildlife.licensing@environment.nsw.gov.au
- notify the NPWS Wildlife Programs and Regulation Unit to arrange placement with an authorised animal exhibitor licensed by Department of Primary Industries and Regional Development.

Notes

Contact details for the department’s Wildlife Programs and Regulation Unit: wildlife.licensing@environment.nsw.gov.au.

10. Release considerations

10.1 Timing of release

Objective

Ensure a monotreme is released as soon as it is ready and at a time that minimises stress and maximises its chances of survival in its natural habitat.

Standards

10.1.1 Once a monotreme is deemed ready for release, it must be released as soon as conditions are suitable (see Standard 10.1.2).

10.1.2 Monotremes must be released when weather conditions encourage high activity levels. They must not be released:

- during or immediately before a storm
- during a heatwave or a cold snap (less than 10 °C night temperature)
- in a bushfire
- when a river or creek is flooding for platypuses.

10.1.3 A monotreme must be released at a time of day that enables to investigate its surroundings. For example:

- an echidna must not be released during the hottest time of the day in summer and cold of night in winter
- a platypus must be released in the late afternoon or evening.

10.2 Release site selection

Objective

Ensure the wild monotreme populations and natural environment are not negatively impacted by the release of a monotreme and the released monotreme has the highest likelihood of survival.

Standards

10.2.1 If the exact location where the monotreme was found is known and it has been assessed as a suitable environment for release, the animal must be released there.

10.2.2 A suitable environment for release of an echidna is one that:

- is away from potential hazards (e.g. more than 50 m from roads, dwellings and dogs)
- provides multiple safe locations to hide (e.g. vegetative cover, shrubs with low branches, leaf litter, roots or fallen branches)
- has no imminent threat of land clearing or development

- for a hand-raised echidna, contains large areas of complex native vegetation.

10.2.3 A suitable environment for release of a platypus is one that contains a body of still, slow or moderately flowing water (not fast flowing or rapids) that is:

- connected to a larger water system (e.g. a creek or river system) with multiple pools of varying depth including deep water to provide refuge if in drought
- not a fragmented, lone pool of water (e.g. dam or singular, unconnected pool)
- not impacted by significant increase or decrease in water volume (e.g. dam release)
- contains freshwater (not saltwater)
- has banks of soil (not rocks or cement) and riparian vegetation
- contains sufficient food resources (e.g. insect populations)
- does not show obvious signs of water pollution
- not near industrial infrastructure that could result in contamination (e.g. aluminium smelters).

10.2.4 If the location where the monotreme was found is assessed as an unsuitable environment for release, the monotreme must be released in a suitable environment as near as possible to this location without transporting it across a physical boundary that it would not normally cross (e.g. a busy road) or further than it would normally move. For example:

- echidnas, including hand-raised echidna puggles: 5 km from the rescue location
- within 1 km for a lactating female echidna in breeding season who will immediately return to the nursery
- platypuses: 5 km from the rescue location, but within the same waterway or in an interconnected waterway and without crossing a dam, weir or waterfall higher than 10 m.

10.2.5 If only the general location where the monotreme was found is known and it contains or adjoins a suitable environment for release, the monotreme must be released there without transporting it across a physical boundary that it would not normally cross or further than it would normally move (see Standard 10.2.4).

10.2.6 If there is no information about where the monotreme was found, it must not be released (see 10.2.7).

10.2.7 In cases where there is no suitable release site, the wildlife rehabilitation provider must:

- consider euthanasia (see Section 5 ‘Euthanasia’)
- contact the department’s Wildlife Programs and Regulation Unit and apply for permanent care (email: wildlife.licensing@environment.nsw.gov.au)
- notify NPWS to arrange placement with an authorised animal exhibitor licensed by the Department of Primary Industries and Regional Development.

10.2.8 Monotremes must not be released into a site recovering from bushfire until:

- the fireground has no hot ash beds present
- waterways are clear of bushfire debris.

10.2.9 A monotreme can only be released in a park if:

- it was originally encountered in that location
- written consent for the release has been obtained from the relevant NPWS area manager (issued under s 11 of the National Parks and Wildlife Regulation 2019) or relevant marine park manager
- the release complies with the relevant departmental policies on translocation.

These 3 conditions also apply to the release of a monotreme in a location where it might reasonably be expected to immediately enter a park (for example, on a road or property adjoining a park).

10.2.10 The release site for an echidna must be confirmed by an experienced echidna rehabilitator.

10.2.11 The release site for a platypus must be confirmed by the NPWS Wildlife Programs and Regulations Unit or a wildlife veterinarian experienced with platypuses.

10.2.12 Wildlife rehabilitators who propose to release a monotreme outside these standards and guidelines require additional approval. Contact the Wildlife Team at wildlife.licensing@environment.nsw.gov.au.

Notes

- Find your local National Parks and Wildlife Service area manager.
- Echidnas live in a variety of habitats, including agricultural and urban environments. Research, maps and local knowledge should inform the suitability of a release site.
- It is important there is no physical barrier between an echidna's rescue and release site as echidnas will travel long distances to return to their home range.

10.3 Release techniques

Objective

Use of release techniques that ensure the released monotreme has the highest likelihood of survival.

Standards

10.3.1 Platypuses must be released on the bank of a waterway and not directly into the water.

10.3.2 Platypuses must be monitored for at least 30 minutes after release to ensure the animal enters the water and exhibits normal behaviour (e.g. no reluctance to swim or dive, no circling) and does not immediately climb out.

10.3.3 Wildlife rehabilitators must consider the capacity for the release site habitat to support the monotreme being released.

Guidelines

10.3.4 Echidnas should be released in the shade and where they can find immediate protective cover.

10.3.5 A hand-reared echidna puggle should be monitored post-release.

10.3.6 Wildlife rehabilitators should arrange for monotremes to be tagged, microchipped or marked (e.g. echidnas can have coloured rubber quill sheaths which drop off after the quill sheds) for individual identification before release. Wildlife rehabilitation providers are encouraged to participate in post-release monitoring programs to determine survivorship.

Notes

All research involving protected animals requires a licence issued under the BC Act and an ethics approval issued under the *Animal Research Act 1985*.

11. Training

11.1 Requirements

Objective

Ensure wildlife rehabilitators have appropriate knowledge and skills to ensure the welfare of monotremes in their care.

Standards

11.1.1 New wildlife rehabilitators must undertake an introductory training course.

11.1.2 Before undertaking monotreme rehabilitation, a person must undertake specialist training.

11.1.3 A specialist training course must:

- teach the standards and guidelines described in this code
- focus on what a person will be able to do as a result of completing the course (i.e. be competency-based)
- teach health and safety issues associated with monotreme rehabilitation (e.g. disease transmission and operating in hazardous locations)
- have a written assessment component.

11.1.4 Wildlife rehabilitators must have an understanding of:

- the objectives of monotreme rehabilitation
- wildlife ecology (e.g. population dynamics, habitat selection, competition and predator–prey interactions)
- animal behaviour (e.g. feeding, predator avoidance, age-appropriate behaviour and social interactions)
- how to keep accurate records.

11.1.5 Wildlife rehabilitators must be proficient in:

- monotreme handling techniques
- first aid for injured monotremes
- recognising the signs of disease, pain and stress
- animal rehabilitation care
- monotreme anatomy and physiology.

11.1.6 Wildlife rehabilitators must be assessed as competent in the relevant areas before undertaking rehabilitation or release of monotremes.

11.1.7 Monotreme training must be accompanied by ongoing support from an experienced echidna or platypus rehabilitator. This can be direct in-field support, or via phone for those in remote locations.

11.1.8 All wildlife rehabilitators must undertake professional development and refresh their training for monotremes every 3 years (e.g. completing a refresher or advanced training course, attending a conference or seminar, or completing an online course).

Guidelines

11.1.9 Wildlife rehabilitators should continue their professional development by keeping up to date with the latest findings from scientific papers on monotremes and developing a relationship with their local veterinary hospital.

11.1.10 Wildlife rehabilitators should undertake nationally accredited microchip training (such as an RSPCA training course) before microchipping a monotreme.

Notes

- The department has prepared *Monotreme rehabilitation training standards for the wildlife rehabilitation sector*, including a trainer's guide, to ensure volunteers are trained to be competent in the implementation of this code.
- Attendance at a monotreme conference or seminars may require pre-approval from a wildlife rehabilitator's group training coordinator to be eligible for consideration as professional development.
- For information on nationally accredited microchip training, see: RSPCA microchip implant training course.

12. Record keeping

12.1 Keeping a register

Objective

Maintain a database of monotremes that have been reported to wildlife rehabilitation providers in order to inform improved rehabilitation outcomes for individual animals, and to contribute to our knowledge of the ecological viability of monotreme species.

Standards

12.1.1 Licensed wildlife rehabilitation providers, central facilities, animal display establishments and individuals must maintain a current register of all monotremes reported, encountered or rescued.

12.1.2 The register must contain the following information on each animal:

- encounter details (date, location, encounter type, the animal's condition and unique ID number)
- species data (species name, sex, stage of development and initial weight)
- rehabilitator details (name of rehabilitator)
- fate details (date, outcome, release location and any permanent marking).

These records must be submitted to the NPWS Wildlife Programs and Regulation Unit (wildlife.licensing@environment.nsw.gov.au) once a year using an approved electronic template.

12.1.3 Wildlife rehabilitators must record the following additional information at the time of assessment by a veterinarian or experienced echidna or platypus rehabilitator:

- details of wounds, injuries, diseases and external parasites
- standard measurements (e.g. weight, body condition score for echidnas or tail volume index for platypuses)
- details of mobility
- details of abnormal behaviour
- recommended management (e.g. euthanasia or prescribed treatment).

12.1.4 Wildlife rehabilitators must record details of the following daily care information:

- the type and quantity of food and liquid offered and ingested
- treatment (e.g. medication, therapy, DNA sampling, pathology results)
- instructions from veterinarians and species coordinators
- changes to general fitness and behaviour
- enclosure cleaning.

12.1.5 When a monotreme is transferred to another wildlife rehabilitator or organisation for any reason, copies of its records must be transferred with it.

12.1.6 If the death of a monotreme is suspected to be the result of a serious disease outbreak, the wildlife rehabilitator must immediately contact their species coordinator to ascertain whether tissue analysis or a necropsy is required. The Department of Primary Industries and Regional Development's 24-hour Emergency Animal Disease Hotline on 1800 675 888 must be notified immediately.

Guidelines

12.1.7 Wildlife rehabilitators should record the following additional information at the time of rescue:

- who discovered the monotreme (name and contact details)
- when the monotreme was discovered (time of day)
- any treatment provided before transport.

12.1.8 Wildlife rehabilitators should record the following additional information at the time of entry into a rehabilitation facility:

- housing (e.g. intensive care, intermediate care or pre-release) (see Section 8 'Housing').

12.1.9 Wildlife rehabilitators should record the following additional information regarding fate:

- if released, details regarding the type of release
- if released, details regarding the condition of the animal
- tag number and/or microchip number.

12.1.10 Wildlife rehabilitators should record the following information for dead monotremes:

- cause of death (if known)
- necropsy notes
- disease testing
- care records of previous rehabilitation.

12.1.11 Wildlife rehabilitators should keep duplicates or backups of records to avoid information being lost.

12.1.12 Sightings of monotremes that are not in need of rescue should be uploaded to NSW BioNet and should contain encounter details (date, location, encounter circumstances and a unique ID number) as well as whether the animal was alive or dead.

12.1.13 If the injury or death of a monotreme is suspected to be the result of animal cruelty (e.g. premeditated poisoning, shooting), the RSPCA should be contacted.

13. Further reading

Augee ML, Gooden B and Musser A (2006) *Echidna. Extraordinary egg-laying mammal*, CSIRO Publishing, Collingwood VIC, Australia.

Grant T and Fanning D (Illustrator) (2007) *Platypus*. 4th edition, CSIRO Publishing, Collingwood VIC, Australia.

Jackson S (2025) *Australian mammals. Biology and captive management*, 2nd edition, CSIRO Publishing, Collingwood VIC, Australia

Koppman L, 2005. *Aspects of hand raising the short beaked echidna*, Australian Wildlife Rehabilitation Conference, Surfers Paradise, Australia, 31 August to 2 September, available at https://www.awrc.org.au/uploads/5/8/6/6/5866843/awrc_leigh_koppman.pdf (PDF 146KB)

Rismiller PD (2010) *Echidnas, the different mammal*, National Wildlife Rehabilitation Conference, Adelaide, available at www.awrc.org.au/uploads/5/8/6/6/5866843/rismiller_echidnas.pdf (PDF 37KB)

Rismiller PD and McKelvey (2003) 'Body mass, age and sexual maturity in short-beaked echidnas *Tachyglossus aculeatus*', *Comp Biochem Physiol A Mol Integr Physiol,* 136(4):851–65, doi: 10.1016/s1095-6433(03)00225-3. PMID: 14667849.

Scott K, Toomey V, Griffiths S, Stenner R (2018) *Principles of echidna rehabilitation: for veterinarians, veterinary technicians and volunteer wildlife rehabilitators*, Wildcare Australia Inc, Nerang, Australia.

Stannard HJ, Bekkers, JM, Old, JM, McAllan, BM and Shaw ME (2017) 'Digestibility of a new diet for captive short beaked echidnas (Tachyglossus aculeatus)', *Zoo Biology*, 36(1):56–61, available at https://onlinelibrary.wiley.com/doi/epdf/10.1002/zoo.21347

Vogelnest L and Portas T (eds) (2019) *Current therapy in medicine of Australian mammals*, CSIRO Publishing, Australia.

Vogelnest L and Woods R (eds) (2008) *Medicine of Australian mammals*, CSIRO Publishing, Australia.

Walton DW and Richardson BJ (eds) (1989) *Fauna of Australia. Vol 1B Mammalia*, Australian Government Publishing Service, Canberra ACT, Australia, available at https://www.dcceew.gov.au/science-research/abrs/publications/fauna-of-australia/fauna-1b

Guidelines

Wildlife Health Australia, Antimicrobial resistance and Australian wildlife (PDF 313KB)

Wildlife Health Australia, Babesia and Theileria in Australian wildlife (PDF 321KB)

Wildlife Health Australia, Coccidiosis in Australian marsupials and monotremes (PDF 251KB)

Codes and policies

- National Health and Medical Research Council, Australian code for the care and use of animals for scientific purposes
- Australian Veterinary Association, Euthanasia of injured wildlife policy
- DCCEEW, Initial treatment and care guidelines for rescued echidnas
- DCCEEW, Monotreme rehabilitation: training standards for the wildlife rehabilitation sector
- DCCEEW, Rehabilitation of protected animals policy
- DCCEEW, People and wildlife policy
- DCCEEW, Translocation operational policy

Legislation

- *Animal Research Act 1985*
- *Biodiversity Conservation Act 2016*
- *Biodiversity Conservation Act 2016* Schedule 5
- *Biodiversity Conservation Act 2016* Schedule 1
- *Biodiversity Conservation Regulation 2017*
- *Biosecurity Act 2015*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Firearms Act 1996*
- *Local Government Act 1993*
- *National Parks and Wildlife Act 1974*
- *National Parks and Wildlife Regulation 2019*
- *Prevention of Cruelty to Animals Act 1979*
- *Poisons and Therapeutic Goods Act 1966*
- *Veterinary Practice Act 2003*

Other resources

- Department of Biodiversity Conservation and Attractions (2024) SC24-11 Euthanasia of animals under field conditions
- Department of Primary Industries and Regional Development, Animal welfare
- Department of Primary Industries and Regional Development, Reporting animal welfare concerns and enforcement
- Department of Primary Industries and Regional Development, Emergency animal disease hotline
- NSW BioNet Atlas

Appendix A: Echidna stage of development

Stage	Details
Egg	Soft-shelled reproductive body produced by a female echidna and held in a temporary pouch for approximately 10 days.
Pouch young	Milk-dependent puggle that is usually spineless or with fine spines developing. Lives in the pouch from hatching (0 days) to approximately 55 days.
Burrow young	Milk-drinking puggle with spines developing or developed and ears now visible. Lives predominantly in a burrow from 55 days to approximately 200 to 210 days.
Juvenile	Independent and fully weaned young echidna, living out of the burrow. May have spur sheath but this is lost (the spur, which does not contain venom, remains) when an animal is 24 to 48 months old.
Adult	Independent living mature echidna.

Appendix B: Age and body weight of echidna pouch young

Age (days)	Mean body mass (grams)	Min. – max. range (grams)	Body mass change (grams/day)
1	0.303	0.231–0.371	
5	3.5	2.8–4.0	0.8
10	8.6	4.4–11.0	1.0
15	25.3	20.3–30.0	3.3
20–25	48.3	40.0–55.0	2.3
30–35	105.5	83.0–165.0	5.7
40–45	148.7	120.0–205.0	4.3
50–55	215.6	180.0–270.0	6.7

Adapted from Rismiller and McKelvey (2003).

Note there may be geographic variability.

Appendix C: Platypus stage of development

Stage	Details
Egg	Reproductive body produced by a female platypus and incubated for approximately 10 to 11 days.
Burrow young	Milk-dependent puggle that lives in a burrow and is up to 4 to 5 months old. Will only be found outside a burrow if its burrow is excavated or during a flood. The bill is square-shaped, although in late-stage burrow young it will transition to a rectangular shape. Distinguishing between a late-stage burrow young and an emerged juvenile is very challenging and the advice of someone experienced with platypuses should be sought as it has important implications for rehabilitation care.
Juvenile	Young platypus, 4 to 5 months (recently weaned) to 12 months old. Usually found outside a burrow. Juveniles emerge from the natal burrow over the summer months. Has a rectangular bill that is longer than it is wide, consumes an invertebrate diet. Females up to 8 to 10 months of age may have a very small white-brown spur sheath (1 to 2 mm long) but older females have no spur or spur sheath. Females cannot be aged beyond 10 months. Young males have spurs covered by a spur sheath (complete or disintegrating) until 12 months.
Sub-adult	Independent young platypus 12 months to 2 years old. The sub-adult life stage can only be accurately identified in males. Sub-adult males have no spur sheath but do have a soft, raised collar of flesh extending at least one third of the way up their spur.
Adult	Independent living platypus that has reached sexual maturity (i.e. more than 2 years old). Males have no spur sheath and a collar of flesh less than one third of the way up the spur. Any platypus without spurs should be considered an adult female unless actual age is known.