Code of Practice for Injured, Sick and Orphaned Koalas

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Preface

The Code of Practice for Injured, Sick and Orphaned Koalas (the Code) is intended for everyone authorised to rescue, rehabilitate and release koalas (*Phascolarctos cinereus*). It has been developed to protect the welfare of koalas in care and the conservation of wild koala populations. The Code contains both standards and guidelines for the care of koalas and is designed to be read in conjunction with the Office of Environment and Heritage (OEH) Code of Practice for Injured, Sick and Orphaned Protected Fauna (General Code).

Koalas are listed as Vulnerable under Schedule 1 of the *Biodiversity Conservation Act 2016* (BC Act). The koala populations in the Pittwater Local Government Area, Coastal area east of the Pacific Highway and between the Tweed and Brunswick Rivers, and in the Hawks Nest and Tea Gardens area are also listed as Endangered under Schedule 1 of the BC Act.

The combined populations of Queensland, New South Wales and the ACT are listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The NSW Koala Strategy commits to supporting native animal rehabilitation groups and establishing common minimum standards of care. The actions in the Strategy are complemented in New South Wales by actions in the Saving Our Species iconic species project for koalas. Records of koalas in care will inform an understanding of population trends, viability, and the effectiveness of threat mitigation actions.

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*, *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 sick, injured and orphaned protected animals issued under the BC Act. A person who contravenes a condition of a BCL is guilty of an offence under section 2.14 (4) of this Act.

OEH is grateful to Shona Lorigan of the NSW Wildlife Council for coordinating the development of this Code in consultation with the veterinary specialists at Taronga Wildlife Hospital, FAWNA (NSW) Inc. (For Australian Wildlife Needing Aid), Friends of the Koala Inc., Port Stephens Koalas Inc., Koala Preservation Society Australia (Port Macquarie Koala Hospital), Looking After Our Kosciuszko Orphans Inc. (LAOKO), Native Animal Trust Fund Inc. (NATF), NSW Wildlife Information, Rescue and Education Service Inc. (WIRES), Wildcare Queanbeyan Inc., Wildlife Rescue South Coast Inc.(WRSC) and Biolink Ecological Consultants.

The Code is neither a complete manual on animal husbandry, nor a static document, and must be implemented by a person trained in accordance with the enclosed standards. 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 koalas. OEH 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 the standards for the care and housing of koalas that are incapable of fending for themselves in their natural habitat. It comprises both enforceable provisions and guidelines. Enforceable provisions are identified by the word ‘Standards’ and they must be followed.

1.1 Interpretations

Objectives

Objectives are the intended outcome(s) for each section of the 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.

1.2 Definitions

In this Code:

Experienced koala rehabilitator means someone who has an extensive knowledge of current rehabilitation techniques gained through training courses and many years of caring for koalas.

Immediate risk of injury means that the likelihood of an animal becoming injured and requiring care is high if immediate intervention is not undertaken, based on a reasonable situation assessment.

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 *National Parks and Wildlife Act 1974*.

Pap is special faeces produced by a koala that plays an important role in the development of the gut of a koala joey. It contains bacteria that are introduced into the gut allowing the koala joey to start eating and digesting eucalyptus leaves. The papping process is commenced whilst the koala joey is still in the pouch.

Protected animal means any amphibian, reptile, bird or mammal (except dingoes) 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.

Wildlife rehabilitator means someone who is either authorised by a wildlife rehabilitation provider or zoological park or is individually licensed by OEH 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 or individually licensed wildlife rehabilitator that is licensed by OEH under the BC Act to rehabilitate and release protected animals.

Zoonoses are any diseases in an animal that can be transmitted to humans.

2 Case assessment

Objective

To assess a koala to determine the type of intervention required. The primary objective of rehabilitation is the successful reintegration of the koala into the wild population and all decisions made are in pursuit of this goal. Some koalas will 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 koala encounter.

2.1.2 Rescuers must arrange for the koala to be assessed by a veterinarian or experienced koala rehabilitator within 24 hours of rescue to ensure accurate diagnosis and prompt treatment or euthanasia.

3 Rescue

Objective

To conduct a koala rescue so as to minimise further stress and injury to the animal.

Standards

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

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

3.1.3 Rescuers must employ the correct rescue equipment for the condition and location of the koala and be trained in its use (see Section 11 Training).

3.1.4 The following methods must not be used to capture a koala:

- noosing with a rope
- shaking the tree
- cutting the branches or tree down
- deliberately forcing a koala to jump from a height.

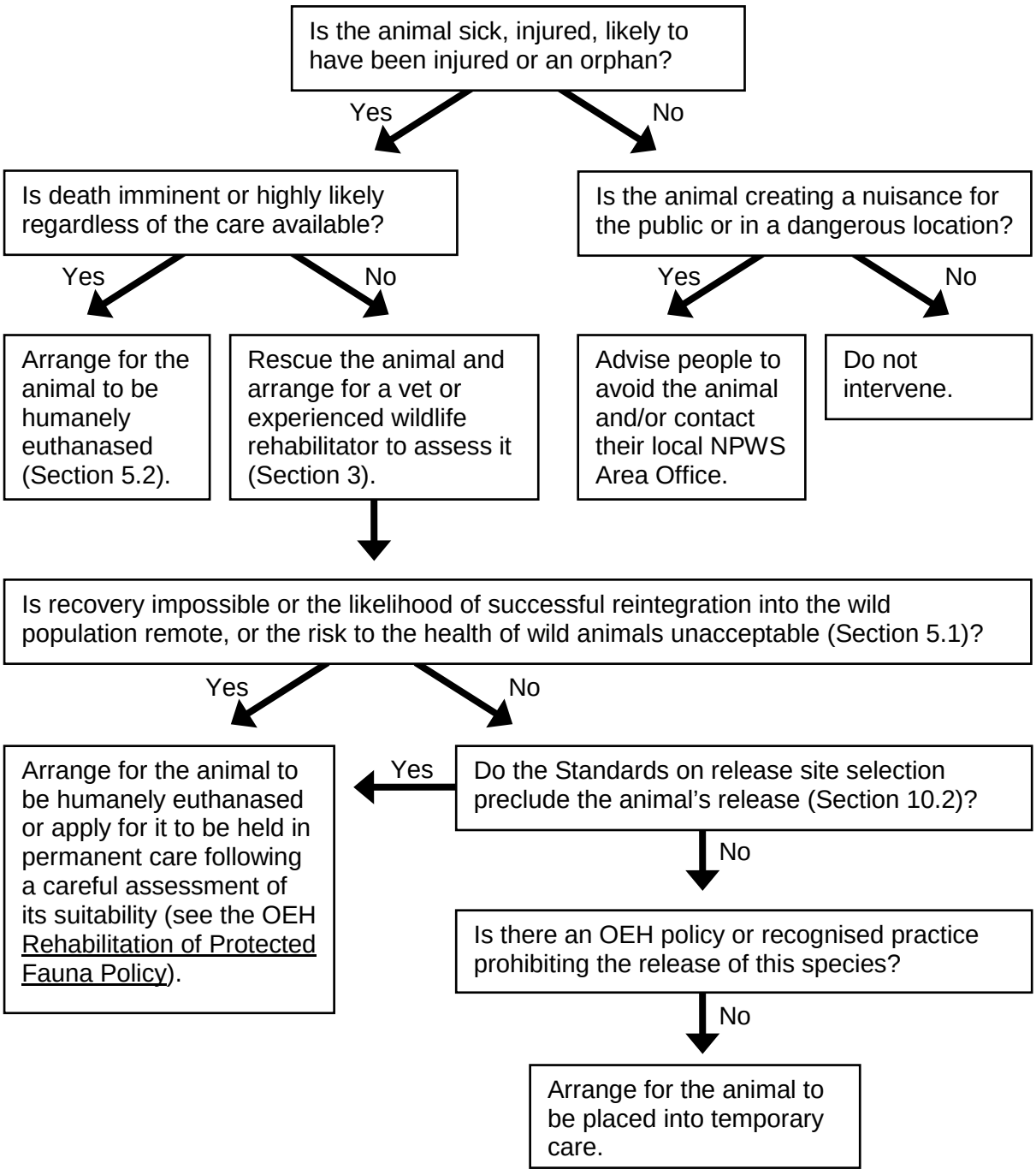

Figure 1 Decision tree for course of action when a koala is encountered

3.1.5 A koala must not be grabbed around the chest.

3.1.6 The rescue attempt must be suspended if the koala is exhibiting signs of stress (e.g. crying or panting).

3.1.7 If the koala has not been captured after being pursued for 10 minutes, the rescue attempt must be suspended to allow the koala to recover. If the koala is not captured after three attempts, the rescue must be stopped.

3.1.8 Rescuers must take steps to protect the koala from additional stressors during rescue, such as onlookers, loud noises, other animals and extreme weather.

3.1.9 If the koala is a suspected orphan, the surrounding area must be searched for the mother. If the mother is found and is healthy, attempts must be made to reunite her with her young.

3.1.10 If the koala is an injured female with signs of having a pouch young (e.g. elongated teat), the surrounding area must be searched for the young.

3.1.11 Rescuers must not move a healthy, independent koala unless it is at immediate risk of injury; for example, the koala is on a road roundabout, a bridge or trapped inside a house or backyard.

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

3.1.13 Rescuers must only attempt to rescue a koala when a sufficient number of trained personnel for that situation and size of the animal are involved.

3.1.14 Koalas have re-curved claws, and these must be disengaged before the koala is removed during rescue.

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

Guidelines

3.1.16 The rescue of a koala should not be attempted unless at least two trained personnel are involved.

3.1.17 If the risk of injury to a healthy, independent koala is not immediate, the hazard should be removed, where possible, and the animal should be observed and allowed the opportunity to move away from the risk independently.

Notes

- A canvas bag, blanket or towel is suitable for catching a koala on the ground.
- A long pole with flagging at one end is suitable for encouraging a koala near the ground to move down.
- A hoop net is suitable for catching a koala in a difficult location.
- A ground trap is suitable for a koala that is too high to flag.
- Covering a koala's head with a towel, blanket or bag will often assist with calming it down.

4 Transport

Objective

To minimise further stress and injury to a koala during transport. This section applies to all movement of the koala including from the point-of-rescue to a veterinary surgery and between rehabilitation facilities.

Standards

4.1.1 The transport method and container size must be appropriate for the size and condition of the koala:

- An orphaned pouch young requires an artificial pouch that is secured within a container (e.g. cage, box or basket). Artificial warmth may also be required and must not be positioned in contact with the koala or transport pouch.
- An adult or sub-adult requires a padded container.

4.1.2 The container must be designed, set-up and secured to prevent injuries to the koala. Hessian sacks must not be used as the koala's claws can become entangled and threads can irritate the eye or be inhaled.

4.1.3 The container must be designed to prevent the koala from escaping.

4.1.4 Whilst in a container, the koala must be positioned so its breathing is not restricted, and its pain or discomfort is minimised.

4.1.5 The container must be ventilated so air can circulate around the koala.

4.1.6 The container must be kept at a temperature that is appropriate for the age and condition of the koala:

- A range of 20–25°C is appropriate for an adult in most circumstances.
- A range of 28–32°C is appropriate for an unfurred pouch young.

4.1.7 The temperature and condition of the koala must be monitored during transport.

4.1.8 Containers must minimise light, noise (e.g. radio), and vibrations and prevent exposure to young children, pets, cigarette smoke and strong smells.

4.1.9 The koala must not be transported in the back of an uncovered utility vehicle, a car boot that is separate from the main cabin, or on the rescuer's lap.

4.1.10 The container must be constructed from a non-porous material that can be easily cleaned and disinfected.

4.1.11 The container must be covered with a breathable cloth to minimise stress.

4.1.12 Koala transport must be the sole purpose of the trip and undertaken in the shortest possible time.

4.1.13 The use of medication to facilitate transport must be assessed and approved by a veterinarian.

Guidelines

4.1.14 A container used for transporting an adult or sub-adult koala should contain something for the koala to hold on to (e.g. a rolled-up towel).

5 Euthanasia

5.1 When to euthanase

Objective

To end a koala's life in situations where death is imminent; or recovery is impossible; or the likelihood of successful reintegration into the wild population is remote; or the animal poses an unacceptable health risk to wild animals.

Standards

5.1.1 A koala must be euthanased without exception when:

- death is imminent or highly likely regardless of the treatment provided, or
- it is suffering from chronic, un-relievable pain or distress, or
- it is permanently unable to consume leaf unaided due to an injured jaw or missing/worn teeth.

5.1.2 A koala must be euthanased (unless OEH has granted permission to hold it in permanent care) when:

- there is no suitable release location, or
- it is permanently incapable of climbing trees, or
- it is permanently impaired, such that it is unable to survive in its natural habitat, (for example vision impairment), or
- its ability to handle branches is permanently impaired due to missing or injured digits.

In certain exceptional circumstances, OEH 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 (DPI). See the OEH Rehabilitation of Protected Fauna Policy for details.

5.1.3 The decision to euthanase should not be based solely on availability of carers within the rescue group. The group should liaise with other licensed groups to facilitate care if necessary.

Guidelines

5.1.4 A koala should be euthanased if it is at a stage of development where it is unlikely to be hand-reared to the point where it can be released.

5.1.5 The decision to euthanase should not be based on a koala's weight at rescue.

Notes

- A koala with a late-stage Chlamydia infection is extremely difficult to cure and poses a health risk to wild koalas.
- A koala can be aged via pre-molar and molar wear using a tooth-wear chart; for example, see Figure 8.4 in Vogelnest and Woods (2008).

5.2 How to euthanase

Objective

To induce death with minimal pain and distress to the koala.

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 prior to disposal of the carcass. The absence of a heartbeat and dilated pupils indicate death has occurred.

5.2.3 When a veterinarian is not available to perform euthanasia, a method appropriate for the species and circumstances must be employed to ensure minimal pain and suffering. This may include the following method:

- shooting with a firearm for large koalas on the ground.

5.2.4 The following euthanasia methods must **not** be used on koalas:

- suffocation via drowning, strangulation or chest compression
- freezing or burning
- carbon dioxide in any form
- poisoning with household products
- air embolism

- exsanguination or decapitation without prior stunning
- electrocution or microwave irradiation
- chloroform or strychnine
- neuromuscular blocking agents.

Guidelines

5.2.5 Wildlife rehabilitators should arrange for a veterinarian to perform euthanasia. The animal should first be sedated and then an intravenous barbiturate overdose should be used.

5.2.6 Shooting should be undertaken by a licensed, skilled and experienced operator within the wildlife rehabilitation provider or an appropriate agency, such as OEH, the RSPCA or NSW Police.

5.2.7 A koala 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

- Refer to *Euthanasia of Animals Used for Scientific Purposes* (ANZCCART 2001) for further information on appropriate euthanasia methods.
- The *Firearms Act 1996* specifies animal welfare as a genuine reason for having a firearms licence.

5.3 Disposal of carcasses and animal waste

Objective

To dispose of waste so that the risks of disease transmission are minimised.

Standards

5.3.1 Carcasses and organic waste suspected of disease contamination or that have been exposed to chemicals (e.g. barbiturates) must either be incinerated or buried at a depth (minimum of 1.2 m) that will prevent scavengers from reaching them.

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

Guidelines

5.3.3 A deceased koala should undergo a necropsy if the cause of death is uncertain. The necropsy should be undertaken by an appropriately trained or experienced person.

5.3.4 Samples for DNA testing should be collected from a deceased koala; for example, plucked hair, ear biopsy, fresh blood, buccal swab and tissue samples (Appendix 1).

Samples are to be sent to the Australian Museum Koala Biobank, Australian Centre for Wildlife Genomics, Australian Museum, 1 William Street, Sydney, NSW 2010.

5.3.5 Pap should be harvested from recently deceased koalas within two hours of death, but not from a koala suffering from Chlamydiosis.

6 Care procedures

6.1 Monitoring

Objective

To check the health of a koala undergoing rehabilitation so that issues 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

6.1.1 A dependent koala (i.e. pouch young) or a koala in intensive care must be monitored repeatedly during the day and weighed at least twice per week.

6.1.2 An independent juvenile koala or a koala in intermediate care must be monitored at least once per day and weighed at least once per week.

6.1.3 A koala being prepared for release must be monitored every day from a distance to determine if it is physically and behaviourally ready for release (see Section 9 Suitability for release).

6.1.4 Wildlife rehabilitators must regularly monitor the temperature of any artificial heat source (e.g. blankets, hot water bottles and electric heat mats) within artificial pouches and enclosures containing thermal support, to ensure appropriate temperatures are maintained.

6.1.5 Within 24 hours of admission all koalas must undergo veterinary assessment or examination by an experienced koala rehabilitator supervised by a koala veterinarian on the phone.

6.1.6 On admission a koala should be checked for:

- bleeding, puncture wounds or matted wet-looking fur
- bone fractures
- body condition by manual assessment (standardised score out of 10) and demeanour
- rapid breathing or elevated heart rate
- dilated pupils or erratic eye movements
- pale or blue mucous membranes
- hydration level
- cold extremities
- ticks and maggots
- discharge from the eyes, nostrils, mouth or cloaca
- odd smells
- condition of fur
- age estimation of the koala.

6.1.7 Once identified, disease or injury should be managed according to severity. This may require veterinary input. Health management of koalas in care must always strive for optimal animal welfare. Recognition and management of pain is important.

6.1.8 Monitoring a koala must entail:

- manually assessing body condition (standardised score out of 10) and behaviour
- checking for signs of injury, disease and parasites
- assessing hydration levels
- determining how much leaf has been consumed
- noting the quantity and quality of scats and urine
- looking for indications of activity.

Guidelines

6.1.9 A koala should be screened for leukaemia, cancer, retrovirus and Chlamydia and the following tests should be completed under general anaesthetic within 48 hours:

- a full blood count
- urogenital ultrasound
- swab of eyes and urogenital tract
- age estimation via tooth wear check
- enlarged lymph nodes.

6.1.10 Where admission is the result of a traumatic injury (e.g. dog attack, motor vehicle impact, bush fire victim) the koala should be given pain relief and treated for shock and fluid therapy.

Note

- Pain relief and fluid hydration must be undertaken in accordance with the *Veterinary Practice Act (2003)*. Wildlife rehabilitators should seek the advice of a veterinarian to determine appropriate and legal first aid treatment.

6.2 Controlling disease transmission between animals

Objective

To prevent the spread of diseases among koalas undergoing rehabilitation. Stressed animals are more susceptible to contracting and expressing infectious diseases.

Standards

6.2.1 A newly arrived koala must be isolated in separate areas until its disease status can be determined by a veterinarian or experienced koala rehabilitator supervised by a koala veterinarian on the phone.

6.2.2 A koala suspected of, or known to be carrying, an infectious disease must be kept under strict quarantine conditions throughout its rehabilitation.

6.2.3 If a koala is suspected to be carrying a new notifiable disease, the wildlife rehabilitator must immediately contact their species coordinator to notify the DPI Emergency Animal Disease Hotline (24 hours) on 1800 675 888 for immediate assessment of emerging health threats.

6.2.4 Dedicated cleaning equipment must be used for enclosures housing koalas with a suspected or confirmed infectious disease.

6.2.5 All enclosures, transport containers, cage furniture, food containers and water containers must be thoroughly cleaned and disinfected after each occupant.

6.2.6 Koalas undergoing rehabilitation must be prevented from coming into contact with domestic pets.

6.2.7 Wildlife rehabilitators must wash their hands thoroughly with soap or disinfectant before and after handling each animal in care.

6.2.8 Other species undergoing rehabilitation must not be kept in the same enclosure as a koala.

Guidelines

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

6.2.10 Pest control is recommended for all rehabilitation facilities.

Note

- Wildlife rehabilitators should make every effort to reduce the risk of contracting zoonoses such as Q fever, scabies and fungal infections including ringworm, by all people present wearing personal protective equipment (e.g. mask, gloves and gowns).

7 Husbandry

7.1 Food and water

Objectives

To ensure the koala has a feeding and watering regime that encourages rapid recovery, supports growth in juveniles, and assists with the maintenance of foraging behaviour necessary for survival in the wild.

Standards

7.1.1 Clean, fresh drinking water must be available at all times and changed daily, except in the case of dependent young (see Paragraph 7.1.7).

7.1.2 Water containers must be designed and positioned so as to avoid spillage and contamination and must be appropriate for the size, age and mobility of the koala.

7.1.3 Fresh leaves must be available for the koala to eat at all times and replaced daily. Leaves may be harvested every two days and stored prior to use.

7.1.4 Stored leaves must not be accessible to pets, pests and wild animals and must be protected from contamination and nutritional and moisture loss (i.e. stored in containers of fresh water for a maximum of two days).

7.1.5 Leaves from at least two different koala preferred eucalyptus species must be offered to the koala each day.

7.1.6 Branches must be placed in holders that contain clean water. The water must be emptied and re-filled as necessary to keep the leaf hydrated.

7.1.7 A hand-reared koala must be fed a milk formula that is appropriate for its stage of development and condition.

7.1.8 A majority of feeds for pouch young (post pap) must be completed at night to replicate natural conditions and nocturnal behaviours.

7.1.9 Contaminant-free dirt and bark must be offered to a koala in the intermediate and pre-release stages.

7.1.10 Leaves must not be dragged across the ground as they may become contaminated.

Guidelines

7.1.11 Leaves from non-eucalyptus native food trees should also be offered.

7.1.12 The choice of eucalyptus species offered to a koala should be varied every few days.

7.1.13 Leaves should be sprayed with water before being offered to a koala.

7.1.14 Both young and mature leaves should be offered to a koala.

7.1.15 Leaves should not be collected from the side of a major road as they are likely to be contaminated.

7.1.16 If multiple koalas are kept within the same enclosure, branches should be placed in different locations so that all koalas can feed simultaneously.

7.1.17 Food in storage should not be accessible to pets, pests and wild animals and should be protected from contamination and nutritional loss.

7.2 Hygiene

Objective

To maintain clean rehabilitation facilities so diseases are prevented or contained.

Standards

7.2.1 Faeces must be removed on a daily basis.

7.2.2 Uneaten leaf must be removed every two days and kept separate from the fresh leaf provided daily.

7.2.3 Food and water containers must be cleaned on a daily basis. Cleaning involves the use of water and the physical removal of all residues.

7.2.4 Bottles and teats used for feeding joeys must be sterilised prior to every feed.

7.2.5 Enclosure furniture, bedding, weighing bags and pouches must be cleaned when soiled.

7.2.6 A koala must be gently cleaned when soiled with faeces, urine or uneaten food.

7.2.7 Wildlife rehabilitators must minimise the disturbance to a koala when cleaning.

7.2.8 Wildlife rehabilitators must wash their hands and clean all food preparation surfaces and equipment prior to preparing animal food.

7.2.9 Equipment used for cleaning animal enclosures, containers and furniture must be separate from those used domestically and must be safe to use on animals.

7.3 General care

Guidelines

7.3.1 The buddying of koalas based on weight and/or stage of development is recommended for the development of natural behaviours and to minimise stress. Wildlife rehabilitation providers should liaise with other providers to facilitate buddying.

7.3.2 All husbandries should be covered in koala specific training (see Section 11 Training).

7.3.3 Each koala should have a husbandry plan.

7.3.4 Koalas are very prone to humanisation and imprinting. All care should be taken to minimise social interactions with humans and natural behaviours should be allowed to develop.

8 Housing

8.1 General requirements

Objectives

To ensure a koala undergoing rehabilitation is housed in enclosures that keep it safe, secure and free from additional stress.

Standards

8.1.1 Enclosures must be escape-proof.

8.1.2 Housing must be made safe for a koala to live in by excluding hazards that might harm it.

8.1.3 Housing must be designed and/or positioned so as to protect the koala from physical contact with wild animals and pests.

8.1.4 Housing must be designed so rehabilitators can readily access the koala.

8.1.5 Artificial pouches must be made from soft fibres and have no loose threads.

8.1.6 From 1.5 kg a koala joey must start to spend time outside and be dehumanised. From 2 kg the koala joey must be outside all the time.

8.1.7 Housing must be positioned so the koala is not exposed to strong vibrations, noxious smells (e.g. wood smoke) or loud noises (e.g. radios, televisions and vehicles).

8.1.8 Housing must be constructed from non-toxic materials that can be easily cleaned and disinfected.

8.1.9 If multiple animals of the same species are kept within a single enclosure, there must be sufficient space for individuals to avoid undue conflict with cage-mates.

Guidelines

8.1.10 Housing should be designed and/or positioned so the koala cannot see or hear domestic pets.

8.1.11 Enclosures listed in each stage of rehabilitation are suitable for average-sized adults. Smaller individuals may not require the space specified and larger individuals may require more space.

8.2 Intensive care housing

Objectives

To reduce activity for a short period of time to facilitate frequent monitoring, treatment and feeding. It is suitable for severely injured or diseased adults and orphaned pouch young.

Standards

8.2.1 Intensive care housing must provide sufficient space for the koala to sit upright and to stretch its body and limbs, but not enough space to crawl around.

8.2.2 Intensive care housing must contain a prop for the koala to hold on to (e.g. rolled up towels).

8.2.3 Intensive care housing must provide a constant temperature appropriate to the koala’s stage of development or the nature of its illness or injury.

8.2.4 The temperature in intensive care housing must be regularly monitored using a thermometer, with minimal disturbance to the koala.

8.2.5 Electrical heat sources must be regulated by a thermostat.

8.2.6 Koalas (excluding unfurred joeys) in intensive care housing must experience a light–dark cycle that replicates outside conditions.

8.2.7 Intensive care housing must be designed and/or positioned so that visual and auditory stimuli are reduced (e.g. by covering with a towel and placing in a quiet room).

8.2.8 Intensive care housing must be adequately ventilated without allowing excessive draughts.

8.2.9 Substrate used in intensive care housing must be soft (e.g. towels, newspaper or hospital padding) and replaced when soiled.

8.2.10 Intensive care enclosures must have floor dimensions of at least 0.7 metres long by 0.7 metres wide.

Guidelines

8.2.11 Intensive care housing should permit easy access for the carer to clean the facility and medicate and assess the animal.

8.3 Intermediate care housing

Objectives

To provide a mobile koala with enough space to allow some physical activity while enabling it to be readily caught for monitoring or treatment.

Standards

8.3.1 Intermediate care housing must provide sufficient space for the koala to move about freely whilst being conveniently sized for capture.

8.3.2 Intermediate care housing must contain two branches, each with a fork, and one slanted pole.

8.3.3 A koala in intermediate care housing must experience a light–dark cycle that replicates outside conditions. This may be achieved by using a well-lit room or constructing an enclosure in a sheltered area outside.

8.3.4 Intermediate care housing must have a roof.

8.3.5 Intermediate care enclosures must have floor dimensions of at least 2 metres long by 2 metres wide and a height of 2 metres.

8.3.6 Hand-reared koalas must be exposed to other koalas during the intermediate care stage.

Guidelines

8.3.7 Intermediate care enclosures should have floor dimensions of at least 3 metres long by 3 metres wide and a height of 2.5 metres.

8.3.8 Adult koalas in intermediate housing should be kept in their own individual enclosure.

8.3.9 Age and sex should be considered when determining the location of koalas in intermediate care:

- Adult females should be housed as far as possible from adult males.
- Adult males should be housed as far as possible from other large adult males.

8.4 Pre-release housing

Objectives

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

Standards

8.4.1 Pre-release housing must provide sufficient space for the koala to move about freely, express a range of natural behaviours and withdraw from co-housed koalas.

8.4.2 Pre-release housing must provide areas where the koala can gain exposure to prevailing weather conditions and areas where it can shelter.

8.4.3 Pre-release housing must contain habitat elements that enable the koala to perform a range of natural behaviours. Each koala requires a minimum of three tree forks and height of at least 3 metres to allow climbing. The forks need slanting (angled) runners positioned to encourage natural movement, muscle strength and climbing skills.

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

8.4.5 Pre-release enclosures must have floor dimensions of at least 6 metres long by 6 metres wide and provide at least 3 metres of usable vertical space.

8.4.6 Pre-release enclosure walls should be smooth on both sides, at least 1.5 metres high and at least 2 metres from the nearest branch, to prevent escape.

Guidelines

8.4.7 Pre-release enclosures should have a live native tree.

8.4.8 Pre-release enclosures should contain a variety of natural branches oriented both vertically and horizontally. Branches should have different thicknesses and textures.

8.4.9 Leaves should be positioned in such a way as to encourage exercise.

8.4.10 Age and sex should be considered when determining the location of koalas in pre-release care:

- Adult females should be housed as far as possible from adult males.
- Adult males should be housed as far as possible from other large adult males.

9 Suitability for release

Objectives

To ensure the koala is physically fit and has the appropriate survival skills prior to its release. Preparations for a koala's release will start at the time of rescue and continue throughout the rehabilitation process.

Standards

9.1.1 A koala must not be released until it is physically ready.

This status has been achieved when:

- it has recovered from any injury or veterinary procedure (e.g. climbs normally)
- it has recovered from any disease. (e.g. Chlamydia affected koalas are no longer assessed as symptomatic)

- its weight is within the appropriate range for its age (koalas are normally independent at 18 months of age, weighing 3.5–4 kilograms)
- its body score is 6/10 (fair) or better as determined by scapula, cranial and limb musculature examination
- it has appropriate fitness levels as determined by observation
- its pelage is adequate for survival in its natural habitat (i.e. fur covering the entire body)
- it has acclimatised to prevailing climatic conditions.

9.1.2 A koala must not be released until it is behaviourally ready.

This status has been achieved when:

- it can recognise and consume eucalyptus leaves unaided
- it is not attracted to humans (i.e. not humanised) or to sights, sounds or smells that are specific to captivity (i.e. not imprinted)
- it can climb effectively
- it can recognise and interact normally with other koalas.

9.1.3 A koala's readiness for release must be confirmed by either a veterinarian or experienced koala rehabilitator.

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

- consider euthanasia (see Section 5 Euthanasia), or
- if euthanasia is not considered appropriate, contact OEH and apply for permanent care, or
- notify OEH to arrange placement with an authorised animal exhibitor licensed by DPI.

Guidelines

9.1.5 A koala should not be released until its fitness is assessed by the following tests:

- a polymerase chain reaction (PCR) test for Chlamydia
- a urogenital tract ultrasound screen
- a full blood count.

10 Release considerations

10.1 Timing of release

Objectives

To ensure a koala 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 koala is deemed ready for release, it must be released as soon as conditions are suitable (see Paragraph 10.1.2).

10.1.2 A koala must be released when weather conditions encourage high activity levels. Release during extremes of temperature and storms must be avoided.

10.2 Release site selection

Objectives

To ensure the wild koala population and natural environment are not negatively impacted by the release of a koala and the released koala has the highest likelihood of survival.

Standards

10.2.1 If the exact location where the koala was found is known and it has been assessed as a suitable environment for release, it must be released there. The exception is sub-adult hand-reared koalas (see Paragraph 10.2.8).

10.2.2 A suitable environment for release is one that:

- contains appropriate habitat and an adequate number of food trees, and
- is occupied by other koalas, and
- is free of immediate risk of injury to the animal (as described in Paragraph 3.1.11).

10.2.3 If the location where the koala was found is assessed as unsuitable environment for release, the koala 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 river) or a hazard that would pose significant risk of injury (e.g. a major road).

10.2.4 If only the general location where the koala was found is known and it contains or adjoins a suitable environment for release, the koala must be released there without transporting it across a physical boundary that it would not normally cross or a hazard that would pose significant risk of injury (e.g. a major road).

10.2.5 If there is no information about where the koala was found, it must not be released.

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

- consider euthanasia (see Section 7 Euthanasia), or
- if euthanasia is not considered appropriate contact OEH and apply for permanent care, or
- notify OEH to arrange placement with an authorised animal exhibitor licensed by the DPI.

10.2.7 A koala can only be released in a park if:

- it was originally encountered in that location, and
- the release has written consent from the relevant National Parks and Wildlife Area Manager (issued under clause 9 of the National Parks and Wildlife Regulation 2009), and
- the release complies with the relevant OEH policies on translocation.

These conditions also apply to the release of a koala in a location where it might reasonably be expected to immediately enter a park (e.g. on a property adjoining a park).

10.2.8 Sub-adult hand-reared koalas must be released in a suitable environment together with the buddy they have been partnered with.

10.2.9 A koala can only be released into a population known to be free of Chlamydia if:

- it was originally encountered in that location, and
- it has not been exposed to Chlamydia during rehabilitation, and
- it has undergone a PCR test to confirm it is free of Chlamydia.

Guidelines

10.2.10 A koala should be released in an area that is connected to other suitable koala habitat.

10.2.11 The release site tree should be surveyed prior to release to ensure another koala is not already in it.

10.2.12 Koala rehabilitators should apply the best available knowledge on local koala populations.

10.2.13 A koala should not be released more than one kilometre from the original location where it was found without consultation with an appropriate species expert who understands local conditions.

10.2.14 A koala should only be released away from its original location when the known in-situ hazards outweigh the hazards associated with relocation.

10.2.15 The release distance for adult koalas or sub-adults that are not hand-reared should not exceed 10 kilometres from the original location.

10.2.16 Hand-reared koalas should not be released more than 50 kilometres from their original location.

Note

- Rehabilitators who propose to release a koala outside of these standards and guidelines may require a translocation approval from OEH. If the rehabilitator is unsure whether a translocation approval is required, they should contact OEH.

10.3 Release techniques

Objectives

The use of release techniques that facilitate successful reintegration of a koala into the wild population.

The collection of information regarding the fate of rehabilitated koalas after release so that the relative merits of different rehabilitation and release techniques can be compared.

Standards

10.3.1 Rehabilitators must arrange for a koala to be uniquely tagged prior to release (numbered swivel sheep tags in the ear are appropriate).

10.3.2 Rehabilitators must arrange for a DNA sample to be taken and sent to the Australian Museum (Appendix 1).

Guidelines

10.3.3 A hand-reared koala should be soft released. This can involve putting the koala into a food tree that is surrounded by a temporary fence. After a few days the fence can be removed.

10.3.4 A hand-reared koala should be released with a similarly aged koala with which it has been housed.

10.3.5 Rehabilitators should not release multiple adult koalas at a single location, as increased competition is likely to have a detrimental effect on the existing koala population.

A koala should be fitted with a microchip prior to release. Rehabilitation groups and zoological parks are encouraged to develop 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*.
- Ear tagging is an appropriate time to collect a tissue sample if that is the DNA technique chosen.

11 Training

Objectives

To ensure koala rehabilitators have the appropriate knowledge and skills to safeguard the welfare of koalas in their care.

Standards

11.1.1 New wildlife rehabilitators must undertake an introductory training course.

11.1.2 Koala rehabilitators must undertake specialist training, including the requirements of this Code, prior to caring for koalas.

11.1.3 All wildlife rehabilitators must attend a refresher training course every four years.

11.1.4 Training courses 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)
- include leaf identification and selection
- teach health and safety issues associated with koala rehabilitation (e.g. disease transmission, managing hazardous chemicals and operating in hazardous locations)
- have a written assessment component (This point does not apply to training for rehabilitation assistants who assist under the direct supervision of an experienced koala rehabilitator.).

11.1.5 Wildlife rehabilitators must be assessed as competent in the relevant areas before undertaking rescue, rehabilitation or release of koalas.

11.1.6 Training must be accompanied by ongoing in-field support from experienced koala rehabilitators.

Guidelines

11.1.7 Koalas rehabilitators should have an understanding of:

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

11.1.8 Koala rehabilitators should be proficient in:

- koala handling techniques
- first aid for injured koala
- recognising the signs of disease
- animal husbandry.

12 Record keeping

Objectives

To maintain a database of koalas that have entered rehabilitation. Records of koala admissions represent a vital resource for koala rehabilitation groups, OEH and research institutions. They can be used to develop better treatments, educate rehabilitators, identify statewide trends in incidents, identify threats and inform success of threat mitigation actions.

Standards

12.1.1 Licensed wildlife rehabilitation providers, zoological parks and individuals must maintain a current register of all protected koalas reported, encountered or rescued. The register must contain the following information on each animal:

- encounter details (date, location, encounter circumstances, the animal's condition and unique ID number)
- species data (species name, sex, age, initial weight, release weight and pouch condition)
- care providers (name and address of the initial assessor, name and address of the koala rehabilitator)
- fate details (date, final disposition, location and any permanent marking).

These records must be submitted to the Biodiversity and Wildlife Unit of OEH (wildlife.licensing@environment.nsw.gov.au) in an approved electronic format on an annual basis.

12.1.2 Wildlife rehabilitators must record the weight and body score (1–10) of the koala in their care so changes can be quickly identified (weighing frequency will depend on the type of care provided; see Section 6.1 Monitoring).

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

12.1.4 If the death of a koala is suspected to be the result of a serious disease outbreak, the koala rehabilitator must immediately contact their wildlife rehabilitation provider to ascertain whether tissue analysis or a necropsy is required. The DPI Emergency Animal Disease Hotline (24 hours) on 1800 675 888 should be notified immediately.

Guidelines

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

- who discovered the koala (name and contact details)
- when the koala was discovered (time of day)
- any treatment or food provided prior to and during transport.

12.1.6 Wildlife rehabilitators should record the following additional information at the time of assessment by a veterinarian or experienced koala rehabilitator:

- details of wounds, injuries, diseases and external parasites
- details of mobility
- details of abnormal behaviour
- recommended management (e.g. euthanasia or prescribed treatment).

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

- standard length measurements (CRL – crown rump length and a head measurement)
- identifying features if the koala is to be housed communally
- housing (e.g. intensive care, general) (see Section 8 Housing).

12.1.8 Wildlife rehabilitators should record the following daily care information:

- details about the type, quantity and frequency of food/liquid ingested
- details of treatment (e.g. medication, therapy, Chlamydia and DNA sampling, pathology results)
- details of instructions from veterinarians and species coordinators
- details of changes to general fitness and behaviour
- details from enclosure cleaning (e.g. quantity and quality of faeces/urine).

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

- if released, details about the type of release (hard or soft)
- if released, details about the condition of the animal (e.g. weight and body score)
- tag and/or microchip number.

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

12.1.11 Records of koala sightings should be uploaded to the OEH Bionet and should contain both encounter details (date, location, encounter circumstances and a unique ID number) as well as whether the koala was alive or dead.

12.1.12 Wildlife rehabilitators should record the following information for dead koalas:

- cause of death
- necropsy notes
- DNA testing results
- records of care of previous rehabilitation.

13 Further reading

ANZCCART 2001, *Euthanasia of Animals Used for Scientific Purposes*, (ed. J Reilly) 2nd edition, Australia and New Zealand Council for the Care of Animals in Research and Teaching, University of Adelaide SA.

DECCW 2010, *Rehabilitation of Protected Fauna Policy*, NSW Department of Environment, Climate Change and Water. Sydney NSW.

Flanagan C 2015, *Koala Rehabilitation Manual 4th edition*, Koala Hospital, Port Macquarie NSW.

Gillett A 2013, *Veterinary handbook for the assessment and treatment of sick and injured koalas*, Australia Zoo Wildlife Hospital, Beerwah QLD, 67pp.

Hanger J and Gipp G 2010, *Principles of koala rehabilitation for volunteer wildlife rehabilitators, veterinary students and veterinarians*, Wildcare Australia Inc., Nerang QLD, 85pp.

Jackson S 2003, *Australian Mammals: Biology and Captive Management*, CSIRO Publishing, Collingwood VIC.

Office of Environment and Heritage 2017, Securing the Koala in the wild in NSW for 100 years, Saving our Species Iconic Koala Project, NSW Office of Environment and Heritage, Sydney NSW.

Office of Environment and Heritage 2018, *NSW Koala Strategy*, NSW Office of Environment and Heritage, Sydney NSW.

Rose K 2007, *Wildlife Health Investigations Manual*, Zoological Parks Board of NSW, Mosman NSW.

Vogelnest L and Woods R (eds) 2008, *Medicine of Australian Mammals*, CSIRO Publishing, Collingwood VIC.

Appendix 1: Australian Museum instructions for sample collection

Instructions for sample collection

Warning: *Wear gloves when sampling. Animal samples may contain infectious agents*

Special notes:
Please try to ensure **sterile and accurate collection**. Poor technique may result in failed tests due to contamination of the sample. Be very careful not to touch sterile swabs with anything other than the sample to be collected.
Fresh blood or tissue samples are best for DNA analysis but hair and swabs can also give a result. Dried blood or tissue samples are still good. Rotting samples can be a challenge in more ways than one.

Ear Biopsy/tissue sample – from live animal

- Use appropriate equipment to obtain biopsy/tissue sample (i.e. sterile surgical scissors, biopsy punch), remove sample into a tube with 90-95% ethanol or DMSO for preservation, or store dry in a freezer.

Moist/fleshy tissue – from carcass

- Sample the most un-exposed piece of tissue you can find to avoid external contaminants. If the sample is rotting, try to locate an intact blood-coloured part. Cut a small chunk of flesh/muscle about the size of a pen lid. Place into a tube with 90-95% ethanol or DMSO for preservation, or store dry in a freezer.
- If you cannot cut a piece of flesh use a dry gauze dressing pad to wipe up the moist remains.
- Place the flesh/muscle or dressing pad into a plastic bag and seal.
- Double bag the sample and freeze until transport.

Fresh blood

- If using a swab stick, wipe the cotton tip of the stick over the sample.
- Place swab stick into a sterile tube.
- If using filter paper, soak or spot blood onto paper, dry at room temperature (avoid direct sunlight). Once dry, seal in Ziplock bag and freeze before sending via express post.
- Blood collected in EDTA vacutainers is also suitable for DNA extraction, please make sure the blood is well mixed with the EDTA in the tube if this collection method is used.

Dry blood

- Use a wet alcohol swab. Wipe the swab over the blood smear.
- Put the wet swab into a small plastic bag and seal.

Hair

- To sample hair, **pluck** (DO NOT CUT - the best DNA comes from the root of the hair) a variety of hairs especially those with obvious colour patterns.
- Place hair remains into a tube or plastic bag and seal.

Buccal swabs

- DNA can be obtained using a buccal cavity/cheek swab. Use a swab stick to wipe in the inside of the cheek/mouth and place into a sterile tube.

Scat

- Sun-dried scats will not yield suitable DNA quantities, so avoid collecting these.
- Avoid touching the scat directly. Use forceps or gloves to place scat into a tube /zip lock bag or envelope and seal and label.

To ensure best possible results from DNA analysis please send sample immediately or freeze/refrigerate sample until immediately prior to sending.

Preferences for sample types:

	Sample Type						
	Tissue/Ear punch	**Fresh Blood**	**Dry Blood**	**Hair**	**Buccal Swab**	**Scats**	**Decomposing Tissue**
Live animals							
Carcasses							

First preference
Second preference
Third preference

Labelling your samples:

It is important to clearly label your sample and record some basic data when: when collecting for scientific purposes.

Always record a UNIQUE identifier – a **unique** sample number should be assigned to each sample taken, so any sample can be individually identified and traced back to the source. While animal names are useful, they are often not unique and may not be able to be traced back to a source, therefore we recommend a numbering system if possible.

Basic data required:

- Name of species (scientific and/or common name)
- Date of sample collection
- Location (GPS or address) of where the animal was found in the wild and/or Organisation (i.e. name of the vet or zoo where the sample was collected)
- If recording a latitude/longitude or GPS co-ordinates, please including the datum the co-ordinate is taken in (e.g. WGM84/GDA/UTM)

Extra useful information:

- Gender
- Sample collector/rehabilitation group/wildlife hospital the animal was processed at.
- Age cohort (adult, sub-adult, juvenile)
- If the animal is deceased – how it died, e.g. disease/roadkill/dog attack
- Disease status – if the animal is alive and showing symptoms of disease

Mailing Address for samples:

Australian Museum Koala Biobank
Australian Centre for Wildlife Genomics
Australian Museum
1 William Street
Sydney 2010
NSW

Any questions please email: **wildlife.forensics@austmus.gov.au**