

A photograph of two colorful lorikeets perched on a tree branch. The birds have vibrant blue heads, red chests, and green wings. They are surrounded by green foliage. The image is partially overlaid by a large green triangle on the right side of the page.

Victorian Wildlife Rehabilitation Guidelines

Part A:
General Information

Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.

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Contents

Part A: General Information

Chapter 1.	Introduction	04
Chapter 2.	Welfare-based decision-making	12
Chapter 3.	Euthanasia of wildlife	24
Chapter 4.	Biosecurity and hygiene	38

Appendix 52

Hand-raising Record-keeping Template	52
Record Keeping Template for Visual and Physical Observations, Feeding and Medication	54

Chapter 1. Introduction

Contents

1.1	Overview	06
1.2	Victorian Wildlife Rehabilitation Guidelines – context and scope	07
1.3	Relevant legislation	08
1.3.1.	Wildlife welfare	08
1.3.2.	Wildlife rehabilitation authorisation	08
1.3.3.	Veterinary and nursing care	08
1.3.4.	Wildlife emergencies	09
1.3.5.	Wildlife impacted by bushfires	09
1.3.6.	The Help for Injured Wildlife tool	09
1.4	Species that may and may not be rehabilitated	10
1.4.1.	Threatened species	10
1.4.2.	Feral or pest animals	10
1.5	Wildlife rehabilitation and self-sustainability	11

1.1 Overview

Wildlife rehabilitators provide an invaluable service for wildlife welfare and conservation in Victoria. In Victoria, wildlife rehabilitation is defined as the process of providing appropriate care, including access to veterinary assessment and treatment and nursing support where required, to sick, injured and orphaned native animals, with the goal of restoring them to their natural condition and releasing them back to the wild.

Wildlife rehabilitation is undertaken by a diverse network of volunteer shelter operators and foster carers (collectively referred to as wildlife rehabilitators). They are supported by wildlife rescuers and registered veterinarians working in private practice or employed by zoos, sanctuaries and non-government wildlife and conservation organisations across Victoria.

Effective wildlife rehabilitation requires considerable knowledge, skill and a willingness to learn. The Victorian Wildlife Rehabilitation

Guidelines (the guidelines) have been created to:

- support wildlife carers to understand current best practice in wildlife rehabilitation
- assist with the administration of basic first aid
- provide health care following veterinary instruction
- provide information on species appropriate housing and nutrition
- ensure environmental enrichment needs are met to result in the best welfare outcomes for the animals in care.

1.2 Victorian Wildlife Rehabilitation Guidelines – context and scope

The Victorian Wildlife Rehabilitator Guidelines (the guidelines) have been prepared and reviewed by the Department of Energy, Environment and Climate Action (DEECA), Zoos Victoria, members of the wildlife rehabilitator community and experienced wildlife veterinarians around Australia. The guidelines are designed to support wildlife rehabilitators to adhere to the conditions set out in the Wildlife Rehabilitator Authorisation Guide: Things you need to know. (Refer to <https://www.vic.gov.au/wildlife-rehabilitation-shelters-and-foster-carers> for any updates).

The guidelines have been developed to incorporate evidenced-based best practice in wildlife care and rehabilitation to equip rehabilitators in delivering positive welfare outcomes for individual animals – from first aid to release into the wild.

The guidelines are not mandatory but provide practical advice on the following:

- Five domains framework for considering and understanding animal welfare
- How to capture, handle, assess, care for and release sick, injured or orphaned native wildlife
- On-going monitoring of animal health to maximise welfare outcomes
- Managing appropriate hygiene and biosecurity issues to mitigate health and safety risks to wildlife, domestic animals and people
- Appendices including templates to support maintaining animal records.

The guidelines cover the most common Victorian species that come into care. In addition to referring to the guidelines, please also refer to the recommended reading list, zoological institutions, and wildlife experts for further advice. Please also seek further information for species not covered.

You must comply with the conditions of your authorisation. These guidelines must be read in conjunction with the conditions of your authorisation.

1.3 Relevant legislation

A wide range of legislations and regulatory bodies govern different aspects of wildlife rehabilitation in Victoria. Since these documents undergo revision and change over time, wildlife rehabilitators are encouraged to visit <https://www.legislation.vic.gov.au/> to access the most recent legislative documents. The most up to date information on wildlife rehabilitation can be obtained by visiting www.wildlife.vic.gov.au.

1.3.1. Wildlife welfare

The *Prevention of Cruelty to Animals Act 1986* is designed to prevent cruelty to animals, to encourage the considerate treatment of animals and to improve the level of community awareness about the prevention of cruelty to animals. The act applies to all animals in our care – domestic pets, wildlife and feral animals.

1.3.2. Wildlife rehabilitation authorisation

All wildlife is protected in Victoria. Wildlife rescuers and members of the public who are simply transporting sick, injured or orphaned wildlife directly to a veterinarian or an authorised wildlife carer do not require an authorisation.

In contrast, wildlife rehabilitators (both shelter operators and foster carers) must hold an authorisation from DEECA under the *Wildlife Act 1975* (www.legislation.vic.gov.au). (Refer to <https://www.vic.gov.au/wildlife-rehabilitation-shelters-and-foster-carers> for any updates).

1.3.3. Veterinary and nursing care

Veterinary care of sick, injured, and orphaned wildlife is also governed by strict regulations and legislation. The Veterinary Practitioners Registration Board of Victoria website carries an up-to-date list of the various legislations which regulate veterinary practice in Victoria. This site should be referred to where up to date legislation is required (<https://www.vetboard.vic.gov.au/VPRBV/Vets/Legislation/VPRBV/Vets/Legislation.aspx>).

Veterinary treatment

Wildlife rehabilitators may only administer first aid and should make every effort to seek veterinary advice as soon as possible after animals come into their care, particularly when the animal is sick or injured. Administration of prescription medication and treatment of wounds must come under the supervision of a registered veterinarian, preferably one with experience in the veterinary care of wildlife. Veterinarians and wildlife rehabilitators should work together to develop and monitor the animal's treatment plan.

Registered veterinarians who assess and treat wildlife in Victoria must follow the same legislation and standards which govern their clinical approach to domestic animals. Provision of veterinary care to wildlife is governed by the *Veterinary Practice Act 1997*. This act precludes non-veterinarians from practising veterinary surgery.

Management of prescription medication and scheduled drugs

The prescription and use of medicines and chemicals in wildlife rehabilitation is tightly controlled. 'Scheduling' is a national classification system that controls how medicines and poisons are made available to the public. Each medication is classified into a schedule according to the level of regulatory control over its availability, and to protect public health and safety. Veterinarians prescribing medications for wildlife rehabilitation must follow the *Agricultural and Veterinary Chemicals (Control of Use) Regulations 2017*, and the *Drugs, Poisons and Controlled Substances Act 1981*.

Medications used to treat sick and injured wildlife must be prescribed by a veterinarian who has direct supervision of the animal. It is important

to remember that this means the veterinarian must have assessed the animal's health before providing directions on the use (including dose rates) of prescription medication for wildlife undergoing rehabilitation.

Management of clinical waste

The Environment Protection Authority Victoria (EPA) is responsible for regulating the storage, transport, treatment, and disposal of clinical and related wastes in Victoria under the *Environment Protection Regulations 2021*. It is not legal to dispose of clinical waste into the general waste system.

Clinical waste which may be generated during wildlife rehabilitation includes:

- Sharps (needles, scalpels or any disposable instrument used to cut animal skin or tissue)
- Blood and blood-soaked waste
- Infected animal tissues and materials contaminated with urine and faeces where the animal has been infected with an infectious organism.

Wildlife rehabilitators should discuss waste disposal options with EPA, local council or veterinarians.

Refer to <https://www.epa.vic.gov.au/for-business/find-a-topic/about-clinical-waste>.



STOP – Please stop and refer to your authorisation for any mandatory conditions regarding the disposal of carcasses.

1.3.4. Wildlife emergencies

In Victoria, emergencies are defined by the Victorian *Emergency Management Act 2013 (EM Act)* within the **State Emergency Management Plan (SEMP)**.

The SEMP defines three different types of wildlife emergencies. These are:

- Cetacean (whale and dolphin) entanglement, stranding and vessel strike
- Wildlife affected by marine and freshwater pollution
- Wildlife welfare arising from a declared emergency (including fire, extreme heat, floods, etc).

The SEMP defines DEECA as the lead control agency for all types of wildlife emergencies. Agriculture Victoria is the nominated lead agency for biosecurity emergencies (such as exotic disease outbreaks) and for managed animals (livestock and companion animals) during emergency events.

Further information on wildlife emergencies can be found at <https://www.wildlife.vic.gov.au/wildlife-emergencies>.

The Wildlife Emergency App allows users to report wildlife impacted by bushfire and other emergencies to DEECA. The report collects basic information, photographs (if appropriate) and confirms the location. If the device is not connected to the internet, the report can still be generated and the user will be prompted to submit it once the device has internet connection.

The Wildlife Emergency App can be download from App stores. For further information visit <https://www.wildlife.vic.gov.au/>.

1.3.5. Wildlife impacted by bushfires

The Victorian response plan for wildlife impacted by fire was developed following the 2019–20 bushfires. The plan describes how DEECA, its partner agencies, contractors and volunteers will respond to wildlife welfare arising from a declared emergency (fire). The plan sets out roles and responsibilities as well as the standards, policies and processes that support the response.

(Refer to **Victorian-response-plan-for-wildlife-impacted-by-fire-FINAL-Feb-2021.pdf**)

1.3.6. The Help for Injured Wildlife tool

The Help for Injured Wildlife tool is a DEECA website that assists the community to access safety information and contact details for help when they encounter sick, injured or orphaned wildlife in Victoria. It is a consolidated online directory of wildlife shelters and foster carers, veterinarians, and rescue and rehabilitation organisations.

Licensed rehabilitators can register their details on the website via the DEECA wildlife website and manage updates to their details via the same portal.

<https://www.wildlife.vic.gov.au/injured-native-wildlife/help-for-injured-wildlife>

1.4 Species that may and may not be rehabilitated

1.4.1. Threatened species

If a threatened species (that is, a species declared as threatened under the *Flora and Fauna Guarantee Act 1988*) enters care, please stop and refer to your authorisation for mandatory conditions including notification and release requirements.

DEECA authorised officers may give permission for some threatened species to be rehabilitated even if the animal is unlikely to survive in the wild as it may be placed into captive-breeding, non-intrusive research programs, or into a zoological institution.

A list of threatened species in Victoria can be found on the DEECA website at <https://www.environment.vic.gov.au/conserving-threatened-species/threatened-list>.

1.4.2. Feral or pest animals

Non-native animals compete with native wildlife for food, shelter and territory and many, such as foxes and cats, are key predators of native wildlife. Under the *Federal Environment Protection and Biodiversity Conservation Act 1999*, several non-native (feral) animals have been formally recognised as a threat to the conservation of endangered species. Under the *Victorian Catchment and Land Protection Act 1994 (CaLP)* certain animals are declared as pest animals in Victoria. Declared pest animals found sick, injured or orphaned must be euthanised. They must not be taken into care for rehabilitation. Releasing a declared pest animal is an offence.

A list of pest animals in Victoria can be found on the Agriculture Victoria website at <https://agriculture.vic.gov.au/biosecurity/pest-animals/priority-pest-animals>.

Photo credit: Zara Bennett



1.5 Wildlife rehabilitation and self-sustainability

As a wildlife rehabilitator, it is important that you ensure that your capacity to care for animals does not affect your own wellbeing. Considerations on your capacity to care can be found in the *Wildlife Rehabilitator Authorisation Guide: Things you need to know*. If you are feeling burnt out, stressed or overwhelmed, it is strongly encouraged that you reach out for support from relevant organisations and online resources. You can find out what mental health services are available in Victoria here <https://www.health.vic.gov.au/mental-health/about-victorias-mental-health-services>.

Other networks and suggestions for support

- Wildlife Victoria – Volunteer for or register for training opportunities with Wildlife Victoria, and follow them on social media <https://www.wildlifevictoria.org.au/rescue-and-transport-training-registration>
- Get involved in the Australian Wildlife Rehabilitation Conference. Contact state representatives and follow them on social media <https://www.awrc.org.au/>
- Become a member of Wildlife Health Australia to keep on top of disease and health information and other learning opportunities here <https://www.wildlifehealthaustralia.com.au/AboutUs/Becomeamember.aspx>.

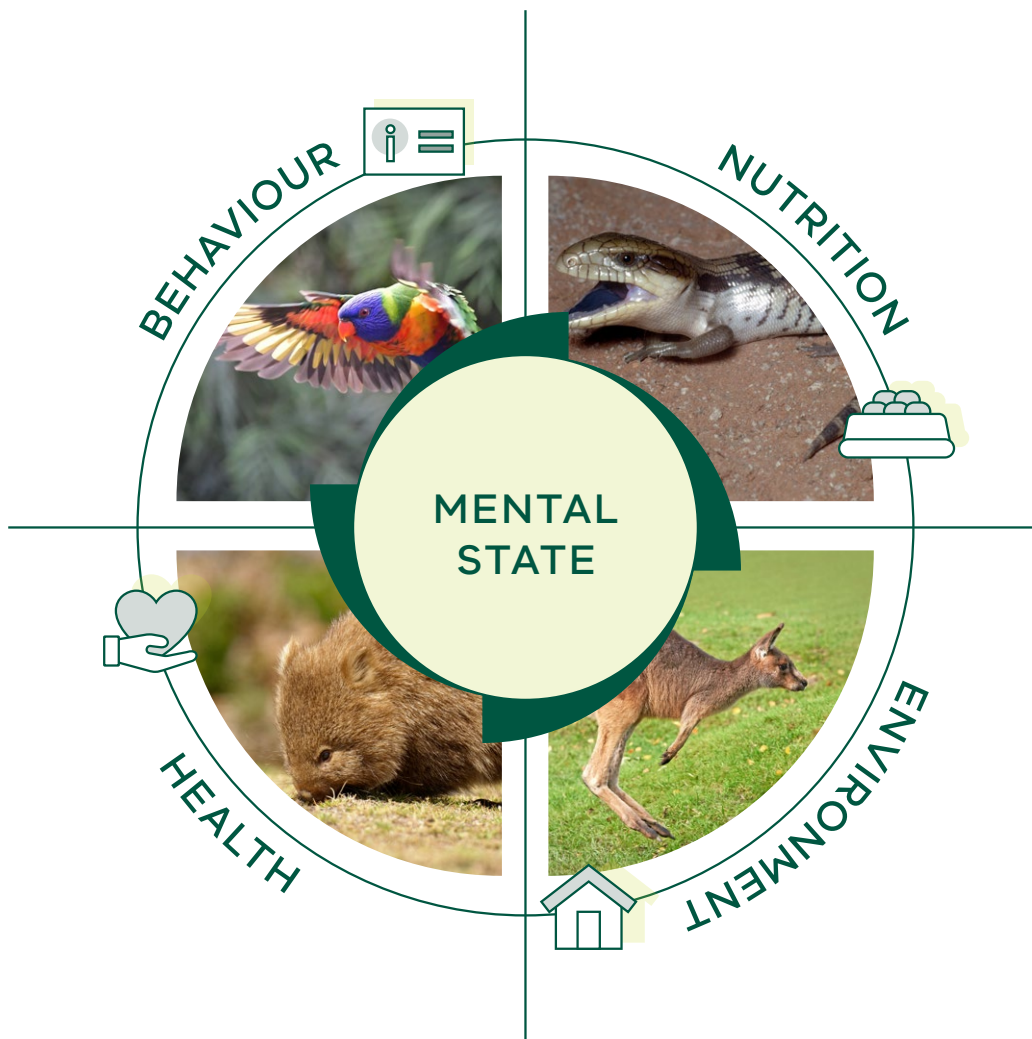
Chapter 2. Welfare-based decision- making

Contents

2.1	The five domains of animal welfare	14
2.2	What is animal welfare?	15
2.3	Wildlife welfare	16
2.4	Welfare-based decision-making for wildlife in rehabilitation	17
	References	21

2.1 The five domains of animal welfare

Enhanced scientific understanding and acceptance of sentience in many species has led to a welcome growth in the recognition of animal welfare as a core scientific discipline. This, in turn, has led to the topic of animal welfare gaining public attention and coupled with social media, will continue to facilitate rapid and widespread dissemination of information.



2.2 What is animal welfare?

Animal welfare describes the quality of an animal's life as it is experienced by the animal. This includes physical health, as well as animal feelings and emotions. An animal's welfare can sit on a scale from negative to positive.

Each species is equipped in their own way to cope with a range of stressors through behavioural and physiological changes. However, if an animal is housed in an environment where it cannot cope the animal can experience biological functioning consequences such as poor healing, compromised immune response and possibly death. On the other hand, if an animal is in an environment that meets all its individual needs and is provided with opportunities to have positive experiences, this can facilitate positive welfare.

The five domains model can be used to support welfare assessment. It describes four physical domains of welfare including nutrition, health, environment and behaviour and one mental domain, affective state. The model suggests that if all physical domains are met, this can lead to a positive affective state, and ultimately provide for good animal welfare.

Recently the model was updated to recognise that for animals to have lives worth living, it is necessary to minimise negative experiences, while at the same time provide the animals with opportunities to have positive experiences. These positive experiences can occur when animals are housed in appropriate social groups in stimulus-rich and safe environments that provide opportunities to engage in rewarding behaviours such as exploration, food-acquisition and positive social interactions. In 2020, the model was updated to give more emphasis to the human dimension of animal welfare and provide guidance on how to evaluate the negative and/or positive impacts of human behaviour on animal welfare. Refer to <https://www.zooaquarium.org.au/public/Public/Animal-Welfare/The-Five-Domains.aspx> for more information.

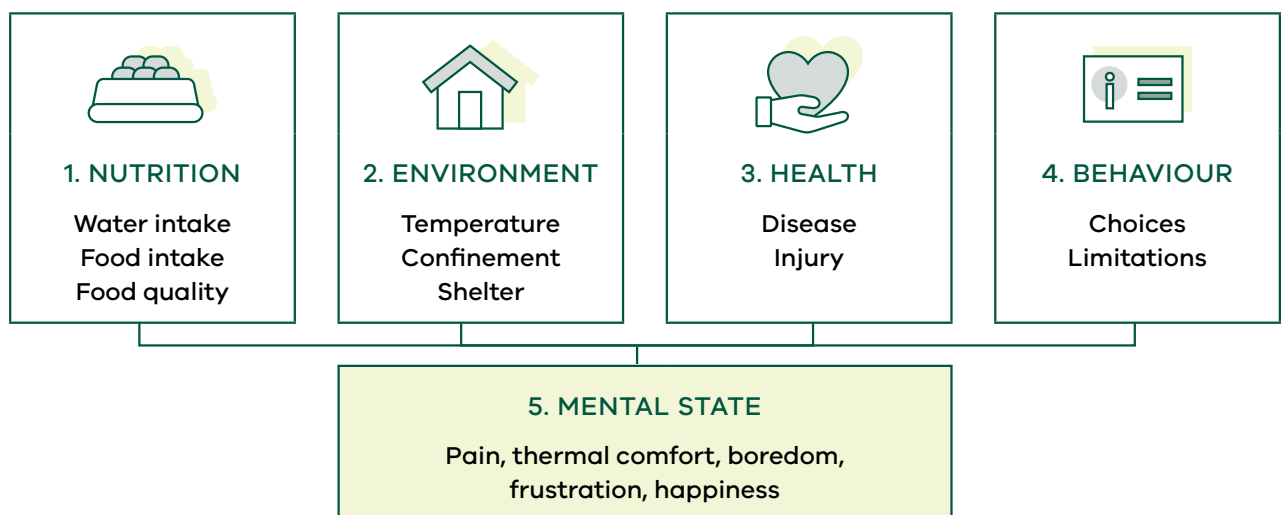


Figure 2.1 The five domains of animal welfare (from Mellor 2017).

2.3 Wildlife welfare

The dominant drive for advancements in animal welfare science has been to guide what humans should do to protect animals in their care and give them a good life. This has been almost exclusively focussed on domesticated animals or permanently captive wildlife. The welfare of free-roaming wildlife has not been the topic of enough debate or focus in the scientific literature, despite being of significant public interest. The welfare of wild animals housed temporarily for the purpose of rehabilitation back to the wild has also had little focus.

It is likely that the interest in wildlife welfare has grown as more people become aware of the substantial impact humans have on wildlife around us – either intentionally or unintentionally. The growing scale and impact of anthropogenic factors on wildlife and wild places has led to an increasing sense of moral obligation in many people to help wildlife in need – to restore or counterbalance the significant impacts our species is having on wildlife. As we are increasingly exposed to news about wild animal suffering across media platforms, we can expect this trend to continue to develop.

Wildlife rehabilitation is defined as the treatment of sick, injured, or orphaned native animals, and their release back to their habitat. While the primary focus is on the individual, consideration should also be given to the population. Wildlife rehabilitation should not compromise the welfare of the population by introducing disease. Wildlife rehabilitation can be good for the conservation of a species as the treatment and release of even small numbers of individuals back into a population can be crucial to population recovery and to bolster declining populations. Additionally, records from wildlife rehabilitation events can contribute to early identification of any emerging threats to wild populations or health of ecosystems. Rehabilitation activities have also been shown to contribute to critical education and public awareness of human impacts on wild populations.

2.4 Welfare-based decision-making for wildlife in rehabilitation

Refer to Figure 2.2 Decision framework for rehabilitation of wildlife, Chapter 1.

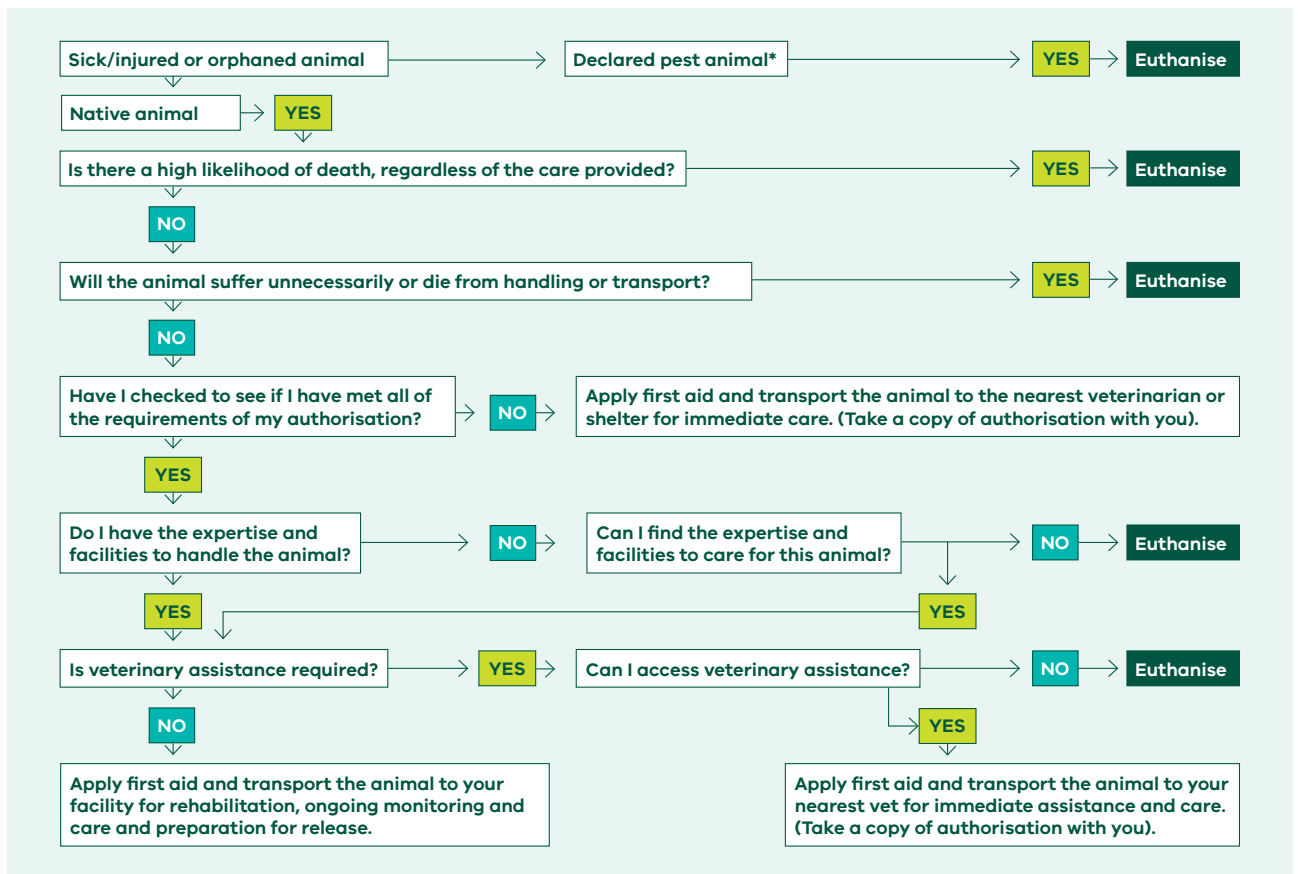


Figure 2.2 Decision framework for rehabilitation of wildlife

*Declared pest under the *Catchment and Land Protection Act 1994*

Welfare considerations relevant to wildlife rehabilitation are unique. Rehabilitators have an incredibly complex role to manage the welfare of wildlife in a way that minimises stress on individuals and maximises their survival when released. Rehabilitators are often faced with the responsibility of deciding to rehabilitate or euthanise rescued wildlife. Euthanasia can be a good welfare outcome as it ends immediate as well as potential longer term suffering. Experience and consultation with a veterinarian can help guide these decisions.

Any wildlife casualty admitted into care will be highly stressed, not just from its injuries or illness but also from being near people and unfamiliar

surroundings. Stress can negatively impact core physiological functions, such as immunity, so is not conducive to recovery. It is important to find a balance between the stressors necessary to treat the animal (for example, medications, confinement and force feeding) and what it needs to recover to return the animal to good health.

A critical feature to optimise the welfare of wildlife undergoing care should be to minimise the time in care as much as possible. This reduces the exposure to potentially stressful stimuli, reduces the risk of humanising animals, and preserves critical survival traits in the species such as physical fitness, foraging success and territorial behaviour.

The decision to rehabilitate should involve a detailed assessment of a range of criteria that can indicate the likelihood of survival during care or post-release. Some key considerations to support welfare-centred decision making include:


- Severity of injury
- Likelihood of any disability that can compromise survival as a result of injury
- Presence of an infectious disease that can pose a risk to other animals during rehabilitation or upon release
- Age of the animal – if either geriatric or very early stage of development where hand-rearing would have poor outcomes for the individual's ability to survive post-release (for example, behavioural inadequacies and imprinting on humans)
- Likely species-specific behavioural challenges not conducive to quick recovery in care or post-release survival including loss of predator aversion, inability to locate appropriate food, poor socialisation skills within and across species or significantly reduced fitness

- Facilities to house the species without compromising its rehabilitation or post-release survival




Any animal that presents with a poor likelihood of being fit for release, has an infectious disease, is too young or too old or requires facilities that are not available should be euthanised in the interest of good welfare.

If the decision to proceed with rehabilitation is made the next consideration is how to minimise stress while under human care and maximise the likelihood of survival post-release. The five domains model of animal welfare provides a useful framework to support good animal welfare during rehabilitation. **Table 2.1** utilises an adapted version of the model (with 'human interaction' added as a sixth domain) applied to wildlife under temporary human care.

Table 2.1 Examples of key welfare risk factors that should be considered to assist with decision-making to improve welfare outcomes for wildlife undergoing rehabilitation (adapted from the five domains model).

Domain	Welfare risks to consider	Possible risk mitigations to consider
Health 	<ul style="list-style-type: none"> • Any presence of hazards that may predispose to injury or illness (e.g. dust inhalation/air pollutants, fence lines) • State of physical fitness and body condition • Biosecurity risk of housing in proximity to other individuals or species • Pain management • Access to appropriate facilities/equipment to facilitate species-specific medical treatments • Fitness levels pre-release 	<ul style="list-style-type: none"> • High standards of hygiene and sanitation that consider biosecurity risks in these settings • Early and frequent access to medical advice from appropriately skilled people • Early medical intervention – good records can be used to chart any observable changes in an animal's demeanour/health status • Detailed medical record-keeping • Opportunities for the animal to re-build strength and condition • Access to fresh air (can dissipate contaminants)

Domain	Welfare risks to consider	Possible risk mitigations to consider
<p>Nutrition</p> 	<ul style="list-style-type: none"> • Ability to access suitable, clean drinking water • Ability to access species-appropriate natural food of appropriate quality (and ability to consume that food according to injury/health status) • Appropriate quantity of food 	<ul style="list-style-type: none"> • Variable diet as the animal progresses through treatment and rehabilitation (according to medical needs and fitness) • Where possible, the provision of natural food found in the location the animal will be released • Consider presentation of food in a way that encourages natural foraging behaviour (to prepare animal for release – see also behaviour domain) • Continuous, adequate supply of fresh drinking water of appropriate temperature
<p>Environment</p> 	<ul style="list-style-type: none"> • Enclosure structure risks that may prevent retreat from threats (extreme weather or other animals, humans) • Terrain or substrate that can result in injury (e.g. consider foot and nail condition) • Ability to deliver medical treatment reliably, non-invasively and isolate from other individuals (where possible) • Risks associated with the sensory environment, noting each species will have different sensory perception e.g. temperature, lighting, noise exposure, proximity of predators or humans • Risks associated with small or barren housing that can result in reduced fitness or under stimulation • Monotony in housing and environmental condition 	<ul style="list-style-type: none"> • Provision of flexibility of housing as the animal progresses through stages of rehabilitation e.g. from intensive care to conditions conducive to rest to conditions that facilitate pre-release fitness building • The provision of as much variation, choice and control as possible – consider enclosure designs that allow each individual to be able to retreat, behaviourally thermoregulate through multiple shade and shelter options, multiple basking options etc. • Provision of enclosure furnishings and features to allow animals to build strength pre-release • Provision of an appropriate sensory environment for the species – consider diurnal vs nocturnal habits, surrounding noises, smells etc. • Where possible, allow access to natural climate variability (unless in intensive care)

Domain	Welfare risks to consider	Possible risk mitigations to consider
Behaviour 	<ul style="list-style-type: none"> • Restricted opportunities to express range of species-appropriate behaviours • Restricted opportunities to express motivated behaviours relevant for recovery (e.g. rest) and build pre-release fitness • Social housing and interactions – implications of social deprivation or over-crowding 	<ul style="list-style-type: none"> • Consider ways food can be presented to encourage natural feeding behaviour • When appropriate, species-specific conditioning programs in place for pre-release fitness including play and exploration • Consider the provision of enrichment that is species specific or recovery specific, supports varied behavioural outcomes and is reliably delivered (e.g. tactile, olfactory, food-based, and cognitive) • Consider appropriate social housing conditions • Simple behavioural observation protocols can be developed for a range of species to support rapid, systematic monitoring
Human interaction 	<ul style="list-style-type: none"> • Prolonged time in care • Excessive human-interaction and human-dependency • Desensitisation to anthropogenic features that can be dangerous upon release (e.g. dogs, cars, people approaching) 	<ul style="list-style-type: none"> • Minimise human interaction and exposure to anthropogenic stimuli (e.g. domestic animals, human environments) wherever possible • Observations and time spent monitoring animals without disturbance (e.g. daily visual check or remote monitoring such as cameras) • Consider randomisation of resource provision so animals don't become dependent on routine
Affective state 	<p>Examples of associated mental experiences based on physical domains above:</p> <ul style="list-style-type: none"> • Minimise negative states: Pain, discomfort, thirst, hunger, exhaustion, isolation, fear • Maximise positive states: exploration, foraging, social, satiety, vitality, calm, content, reward 	

Essentially, the welfare of wildlife during rehabilitation will be improved by reducing the time in captivity as much as possible, providing a calm environment and maximising positive experiences such as satiation, social normality and offering the opportunity to explore and forage. Minimising negative experiences such as pain, discomfort, thirst, hunger, exhaustion, isolation and fear also optimises welfare.

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Chapter 3. Euthanasia of wildlife

Contents

3.1	Welfare-based euthanasia decision-making	26
3.2	Conditions for which euthanasia is recommended	27
3.3	Acceptable methods of euthanasia	28
3.3.1.	Lethal injection – barbiturates	29
3.3.2.	Topical chemical euthanasia – Benzocaine in amphibians	30
3.3.3.	Firearms (gunshot)	30
3.3.4.	Penetrating captive bolt	31
3.3.5.	Cervical dislocation	31
3.3.6.	Blunt trauma	31
3.3.7.	Physical methods used to cause death following loss of consciousness	32
3.3.8.	Eggs	32
3.4	Unacceptable methods of euthanasia	33
3.5	Confirmation of death	33
3.6	Necropsies	34
3.7	Carcass disposal	35
	References	36

3.1 Welfare-based euthanasia decision-making

Euthanasia, the practice of intentionally and humanely ending a life to relieve pain and suffering, may be the most humane course of action for sick, injured or orphaned wildlife. Animals may present with severe and untreatable injuries or diseases or be too young to be hand-raised (for example poor prognosis for survival such as unfurred pouch young) where the kindest decision is to end that animal's life.

Euthanasia can trigger strong emotional responses, particularly when an animal is an iconic or threatened species, or if it has been in care for some time. These decisions can be particularly difficult where there are differences of opinion as to the level of suffering, or the potential for the animal to recover so that it will not simply survive but thrive in the wild following release. However, euthanasia decisions should not be based on human emotions – the welfare of the animal in question must be the primary consideration.

Euthanasia can provide a good welfare outcome for animals, because it ends suffering immediately. When presented with sick, injured or orphaned wildlife, rehabilitators and veterinarians need to consider both the immediate welfare status of the animal AND whether or not rehabilitation will result in a good welfare outcome for the animal's future, after it has been released back to the wild.

Consideration of the five domains of animal welfare (see **Part A, Section 2.1**) and application of the decision-making flow chart in **Figure 2.2**, chapter 1 support an objective decision-making process which will help provide confidence that the right decision has been made. Wildlife rehabilitators and veterinarians need to assess the capacity to address all five domains during the process of rehabilitation and up until released to the wild. If these domains cannot be adequately met, euthanasia provides the best welfare outcome for the animal.

Euthanasia should be considered at the point of triage (when the animal first comes into captive care) and at any point during rehabilitation if the animal's response to treatment and care is not as expected, or if its welfare status is deteriorating.

Both the decision and process of euthanasia should be performed by a veterinarian. If a veterinarian is not available, a wildlife rehabilitator may need to make the decision and carry out the procedure. To ensure this process is humane, adequate training, resources and support should always be available.

In Victoria, wildlife rehabilitators are guided by the conditions of their rehabilitation authorisation. Refer to shelter and foster carer authorisation conditions for factors to be considered for euthanasia.

Wildlife rehabilitators are encouraged to talk through these decisions respectfully and carefully with their veterinarians. Wildlife rehabilitators should refer to the conditions of their authorisation while discussing options with a veterinarian. If there is any concern that an incorrect decision has been made, further opinions can also be sought from DEECA authorised officers, experienced wildlife rehabilitators or wildlife veterinarians, with any additional information fed back to the primary veterinarian so that they can also learn from the experience of others.

3.2 Conditions for which euthanasia is recommended

While welfare is always the most important consideration guiding euthanasia decision-making, some exceptions may apply to wildlife that are listed as threatened under the *Flora and Fauna Guarantee Act 1988*. This only applies in cases where welfare can be managed if euthanasia is not implemented. Special effort may be made to rehabilitate these animals even if release into the wild is unlikely, as they may be utilised in captive breeding or similar programs. Euthanasia is still indicated in cases where these species are suffering from unreasonable and/or incurable pain, distress, trauma, sickness or injury. Refer to your authorisation for mandatory conditions including notification and release requirements and contact the DEECA contact centre on 136 186 to discuss options for these animals.

A decision framework for euthanasia decision making in wildlife is outlined in **Figure 2.2**. If a veterinarian recommends euthanasia, that is the course of action that should be followed.

Photo credit: Dannica Shaw



3.3 Acceptable methods of euthanasia

To truly be a 'humane death', which is the definition of euthanasia, it must be carried out by people who are trained in the procedure, and undertaken in a manner which is respectful, with an emphasis on making death as painless and stress free as possible, resulting in rapid loss of consciousness followed by death. If there is any doubt about the decision or the process then that animal should be kept warm, hydrated and comfortable, and immediate assistance sought from either a veterinarian or other experienced rehabilitator.

While there are no 'perfect' euthanasia techniques, particularly since contact with humans is likely to be stressful to wild animals, approaches to euthanasia should:

- quickly render the animal unconscious, rapidly followed by death
- have consistent and predictable outcomes
- be relatively easy and safe to perform by trained personnel with appropriate equipment
- have minimal emotional impact to operator and observers
- cause minimal physiological stress to the animal
- not be subject to abuse by people
- not result in environmental pollution/contamination.

Animals should be euthanised in a quiet area, away from other animals, because distress signals from the sick or injured animal may cause fear and distress among other animals.

While detailed information on acceptable euthanasia methods is provided below, a summary of the acceptable and non-acceptable methods for each species is also provided in **Table 3.1**.

The following methods should only be undertaken if you are sufficiently trained and authorised.



STOP – Please stop and refer to your authorisation for mandatory conditions including methods that MUST NOT BE USED for euthanasia.

3.3.1. Lethal injection – barbiturates

Euthanasia by overdose of a barbiturate anaesthetic, ideally while the animal is under sedation or anaesthesia, is the preferred method of euthanasia of wildlife. Given that the drugs required to achieve this are strictly controlled substances in Australia, this method of euthanasia is only legally administered by

registered veterinarians. Wildlife rehabilitators are not legally permitted to perform euthanasia using barbiturate anaesthetics in Victoria unless they are a registered veterinarian.

Where a registered veterinarian is not available for euthanasia, there are several other acceptable methods of euthanasia detailed below.

Table 3.1 Acceptable methods of euthanasia by taxonomic grouping (adapted from Department of Biodiversity, Conservation and Attractions (2017). Standard Operating Procedure: Humane Killing of Animals under Field Conditions. Perth, WA.)

	Topical chemical (Benzocaine)	Firearm (gunshot)	Captive bolt	Cervical dislocation	Blunt trauma
Small mammals (e.g. small possums, gliders)	x	x	x	✓ individuals <150 g	✓ individuals <150 g
Medium sized mammals (e.g. bandicoots, Brush-tail possums)	x	✓	✓	✓ Juveniles <150 g	✓ Juveniles <150 g
Kangaroos, wallabies, wombats and koalas	x	✓	✓	✓ Juveniles <150 g	✓ Juveniles <150 g
Birds (including chicks)	x	✓ Only large birds >3 kg	x	✓ Small birds <150 g	✓
Lizards, snakes, turtles	x	x	x	x	✓
Amphibians	✓	x	x	x	✓
Eggs	x	x	x	x	✓

3.3.2. Topical chemical euthanasia – Benzocaine in amphibians

Euthanasia of amphibians can be achieved via the topical administration of benzocaine, a local anaesthetic that is the active component of several over the counter gels (no prescription is required) used for dental pain relief in people (for example, Oral-eze Dental Emergency Toothache Medication).

Euthanasia of frogs using topical benzocaine dental gels is generally quick (loss of consciousness in 60–90 seconds, with death occurring within two minutes), however it can take up to 10 minutes. The procedure should be conducted where ambient temperature matches the natural active thermal range for the species in the wild. Place a small amount of benzocaine-containing dental gel into a small container. Put the frog into the container so that the gel is in contact with the underside of the frog.

Death can be confirmed by assessing response to stimuli (for example lightly touching the cornea of the eye and observing for blink reflex or pinching the toe and assessing the presence of withdrawal reflex). If any doubt remains, follow up with a secondary physical euthanasia technique such as pithing (see below) once the frog has lost consciousness.

Always follow the directions on the safety information for the benzocaine gel purchased by reading the material safety data sheet (MSDS) carefully and dispose of remaining benzocaine gel appropriately.

3.3.3. Firearms (gunshot)

Legal considerations

Firearms (including dart guns), which are covered under Victoria's firearms legislation, must only be used, transported, and stored by licenced firearm operators in accordance with Victoria's firearms legislation. It is also illegal to carry or discharge a loaded firearm in a public place without a permit, an exemption, or the permission of the chief commissioner of Victoria Police. All firearm users must be the holder of a current Victorian category A and/or B longarm licence, depending on the type of firearm being used.

As per the terms of their firearm licence, the firearm user is responsible for the safety of any other people present during discharge of a firearm. All observers must stand well behind the shooter when an animal is being shot and the line of fire chosen should prevent accidents or injury from stray bullets or ricochets. For more information and requirements, visit the Victoria Police website www.police.vic.gov.au

Where macropods are euthanased by firearm, rehabilitators should comply with the *National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Non-commercial Purposes*. For more information visit the Australian Government's Department of Climate Change, Energy, the Environment and Water website <https://www.dccew.gov.au>

Firearms

Euthanasia via gunshot is a rapid and effective means of humanely killing wildlife when used appropriately, by trained personnel. It is particularly useful with large animals, and where wildlife cannot be safely handled and restrained. Euthanasia can be achieved from a distance, particularly when experienced shooters are able to place an accurate shot. When used appropriately, a gunshot will result in immediate loss of consciousness and rapid death by direct and rapid destruction of brain tissue.

Kangaroos, wallabies and wombats must only be shot with a combination of firearm (calibre and projectile weight of ammunition) that meets or exceeds those specified in the National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Non-Commercial Purposes.

Point of impact

Wherever possible, wildlife should be euthanised by a shot to the brain causing instant loss of consciousness. However, under circumstances where a shot to the brain of an injured animal is impractical or unsafe, a shot to the heart/lung area is permissible, but this should be followed by a brain shot as soon as it is safe to do so to ensure a rapid loss of consciousness.

3.3.4. Penetrating captive bolt

Use of a penetrating captive bolt is a useful alternative to using firearms or lethal injection and when performed appropriately by trained personnel can result in rapid loss of consciousness via a direct and rapid destruction of brain tissue. A penetrating captive bolt euthanasia device can be used to euthanise large mammals such as kangaroos, wallabies, wombats or koalas.

There are several disadvantages to this technique, which must be considered by wildlife rehabilitators when deciding on a method of euthanasia. While no licence is required (at time of publication) to purchase or use a captive bolt in Victoria, training is necessary to ensure the captive bolt is used correctly to achieve a humane death.

Some considerations include:

- **Proximity to animal** – Achieving rapid loss of consciousness and death requires close access to the animal and accurate placement of the captive bolt directly against the skull. This precludes its use in dangerous animals or animals which are ambulatory
- **Correct choice of equipment** – A non-penetrating captive bolt device stuns the animal and does not necessarily cause death. If a non-penetrating captive bolt is used, a secondary euthanasia method must be used to confirm death
- **Correct anatomical placement** – When applied to the wrong anatomical position on the skull, severe cranial trauma will occur and, if not accompanied by destruction of brain/brain stem, will not lead to rapid loss of consciousness but will likely result in significant pain. The animal must be immobile to do this

- **Appropriate species/size** – There is a lack of evidence to support the use of captive bolt in small species, including birds. While severe cranial trauma and death does occur, some recent research in birds has found that it does not result in a humane death and is only recommended for use in a two-step euthanasia process, following sedation or anaesthesia. It is not appropriate for use in pouch young or small animals under 150 g.

It is likely that the use of captive bolt for euthanasia of wildlife will improve over time as this procedure is developed and more research provides a better understanding of appropriate techniques in different species. Wildlife rehabilitators should be trained and proficient in this technique before applying it.

3.3.5. Cervical dislocation

Cervical dislocation has been used for euthanasia of small vertebrates for many years and when implemented by well-trained personnel, confident in its application, results in rapid unconsciousness, loss of pain perception and death by severing the connection between the brain and spinal cord. It is only acceptable for the euthanasia of birds and mammals weighing less than 150 g and should only be undertaken by rehabilitators that are trained and proficient in this technique.

3.3.6. Blunt trauma

Euthanasia via this method is achieved via a single, sharp blow delivered to the skull with sufficient force to produce immediate loss of consciousness and destruction of brain tissue. It is only appropriate for small animals weighing less than 150 g and should only be undertaken by rehabilitators that are trained and proficient in this technique.

3.3.7. Physical methods used to cause death following loss of consciousness

A number of physical methods can be used to cause death following loss of consciousness produced by one of the acceptable methods above.

- **Pithing** – Pithing can be used to physically destroy the brain stem or spinal cord by inserting a sharp needle or probe into the spinal cord or the base of the skull. Pithing is generally only used as a secondary means to achieve death in fish, amphibians and reptiles.

3.3.8. Eggs

Eggs may occasionally be found after storms or tree felling operations. If incubation facilities are unavailable it may be necessary to euthanase the embryo. The egg should be candled to determine if an embryo is present. Candle the egg in a dark room by shining a bright light against the shell. If it contains an embryo, blood vessels will be visible. If no blood vessels are visible the egg has not been fertilised and no action is required. An early-stage egg is characterised by blood vessels and a dark spot, which represents the embryo. This egg can be euthanized by placing it in the refrigerator for four hours. In a late-stage egg, the embryo will occupy progressively more space until it almost completely fills the shell. It may be possible to recognise features such as feet. At this stage of development the egg should be cracked open and the embryo euthanised via blunt trauma.

3.4 Unacceptable methods of euthanasia

Any method that does not result in instantaneous or rapid loss of consciousness without pain, discomfort or distress does not fulfill the definition of 'euthanasia' as a humane death and is not acceptable under any circumstances.

Euthanasia methods must result in immediate loss of consciousness followed by death and must not place the operator at risk.



STOP – Please stop and refer to your authorisation for mandatory conditions including methods that MUST NOT BE USED for euthanasia.

3.5 Confirmation of death

All animals that are euthanised must be examined carefully to confirm that the animal has died before disposing of the carcass. To check that death has occurred, the following should be noted:

- Lack of blinking when the centre of the eye (cornea) is touched
- The eye becomes glazed rather than shiny and the pupil is dilated and non-responsive to light shone directly towards the back of the eye (for example light shone into the eyes)
- Lack of withdrawal (pulling away) in response to stimulation (for example firm pinch of the toes)
- Lack of a pulse or heartbeat.

If there is any doubt about confirmation of death, a second method should be employed to ensure the animal has been euthanised. Note: Absence of breathing alone cannot be used to confirm death, particularly in ectothermic animals such as reptiles and amphibians.

3.6 Necropsies

Unusual clinical signs or mass mortality events where a number of animals are dying, or found dead, at the same time, with similar signs, may indicate an animal disease emergency, an emerging/new infectious disease or an environmental/human related toxicity which needs further investigation. Wildlife rehabilitators and veterinarians should contact their state Wildlife Health Australia coordinator: <https://www.wildlifehealthaustralia.com.au/AboutUs/ContactDetails.aspx> or the Emergency Animal Disease Watch Hotline on 1800 675 888.

While wildlife rehabilitators may be interested in performing post-mortem examinations as a learning experience, there are many organisms – bacteria, viruses, parasites and fungi – which can present a significant risk to human health, even if they don't appear to be causing sickness in the wild animal itself. Post-mortem examination should only be conducted by trained professionals, with the appropriate resources to minimise the risk of either exposing other wild animals to potential pathogens or contaminating the local environment.

A necropsy is performed by a veterinarian where the cause of death needs to be determined. This can provide information about the animal's illness or injury or the incidence of disease in free ranging animals and can contribute invaluable information to our overall understanding of wildlife health in Victoria.

Necropsies should be conducted as soon as possible after death to minimise the possibility of post mortem changes obscuring the cause of death. If the necropsy occurs within 48 hours of death, the body should be kept cool in a refrigerator or with freezer bricks. Longer than 48 hours and the body should be frozen. Freezing will lead to the development of ice crystals in various organs, which can affect the pathologist's ability to determine a cause of death, but it is preferable to allowing the body to decompose.

While it may be tempting for wildlife rehabilitators to conduct their own 'research', it is not legal to implement research or hold biological samples without a valid research permit. Contributing to broader research and disease surveillance programs implemented by universities, zoos and government agencies has a much bigger

potential to contribute meaningful information and help progress wildlife rehabilitation at a national level.

Where permits have been obtained, universities, government agencies or zoos may be interested in receiving carcasses for teaching purposes or to contribute to research into wildlife health and welfare.

Funding is available for the investigation of unusual or mass mortality events in wildlife by registered veterinarians: <https://www.wildlifehealthaustralia.com.au/ProgramsProjects/NSDIProgram-Funding.aspx>

Carcasses for necropsy should be 'double bagged' (placed into two separately sealed bags to prevent bodily fluids from leaking and contaminating the environment or increasing the health risk to people and other animals). Zip lock bags make excellent body bags for small animals. A label must always be attached to the OUTSIDE of the bag, so that information can be read PRIOR to opening the bag containing the body itself. Consider storage of the body when deciding which label to use – it is often a good idea to put this information on a piece of paper inside a smaller bag between the two 'body bags' so that it isn't lost, and leakage of fluids doesn't make the writing illegible.

Labels should include:

- Name/contact details of appropriate people
- Location found
- Date died or date found
- Species
- Any relevant health information.

3.7 Carcass disposal

All carcasses should be disposed of in accordance with local laws (see **Part A, Chapter 1**). Animals that have been euthanised with barbiturates, bat carcasses and suspected diseased carcasses should be either incinerated or buried to a depth of more than 60 cm to prevent scavenging by other animals. Secondary poisoning and deaths may result from the consumption of animals killed with barbiturates. Carcasses should not be buried closer than 100 m to a waterway to avoid contamination. Some local councils and research facilities have incinerators, which they may make available to rehabilitators for carcass disposal.

Australian bat lyssavirus (ABLV) may be present in any bat and is transmissible to humans. Refer to Part B, Chapter 4. Flying foxes for instructions regarding handling bat carcasses and ways to avoid potential ABLV exposure.

Contact the DEECA contact centre on 136 186 when threatened species are concerned as these may be helpful specimens for the museum or other researchers.

Carcasses may be frozen for a limited period (in non-food freezers) prior to incineration or donation to pre-approved facilities (some public institutions and individuals may be authorised to possess the specimen for educational or research purposes).

A permit must be obtained from DEECA to keep animal parts, such as skeletons or skins, or whole carcasses. It is illegal to keep, sell or pass on any dead wildlife or wildlife parts without authorisation.

References

National code of practice for the humane shooting of kangaroos and wallabies for non-commercial purposes, <https://www.awe.gov.au/biosecurity-trade/wildlife-trade/publications/national-code-practice-humane-shooting-kangaroos-and-wallabies-non-commercial>

Model codes of practice and standard operating procedures for the humane capture, handling or destruction of feral animals in Australia, <https://www.awe.gov.au/biosecurity-trade/invasive-species/publications/model-codes-practice-feral-animals>

Standard Operating Procedure, Humane Killing of Animals Under Field Conditions, Department of Western Australia, Parks and Wildlife Service, Department of Biodiversity, Conservation and Attractions, <https://www.dpaw.wa.gov.au/images/documents/plants-animals/monitoring/sop/SOP%20Humane%20Killing%20of%20Animals%20under%20Field%20Conditions.pdf>

Photo credit: Marcia Riederer



Chapter 4. **Biosecurity and hygiene**

Contents

4.1	Identifying and reporting infectious disease in wildlife	41
4.2	Biosecurity and hygiene – minimising disease transmission	43
4.2.1.	Personal hygiene	43
4.2.2.	Separation between wildlife patients and domestic animals	44
4.2.3.	Effective pest control	45
4.2.4.	Environmental hygiene and disinfection	46
4.2.5.	Managing risks of inappropriate use of antimicrobial medications	47
4.3	Zoonoses – risks to human health	48
4.3.1.	Sarcoptic mange	48
4.3.2.	Ringworm	49
4.3.3.	Bacterial infection of skin wounds (for example <i>Pasteurella</i>)	49
4.3.4.	Psittacosis	49
4.3.5.	Q fever	49
4.3.6.	Leptospirosis	49
4.3.7.	Gastrointestinal bacteria and protozoa	49
4.3.8.	Australian bat lyssavirus (ABLV)	49
4.3.9.	Ross River virus	50
4.3.10.	Toxoplasmosis	50
4.3.11.	Allergies	50
4.3.12.	Buruli ulcer	50

Biosecurity is defined as the set of precautions taken to minimise the risk of introducing a pest or infectious disease into an animal (or human) population. Wildlife biosecurity means managing risks, primarily associated with infectious diseases transmitted from wildlife to humans (and vice versa), from wildlife to domestic animals (and vice versa), and between groups of wildlife. It focuses on minimising and managing the risk of infectious disease spreading from one individual or population to another and looks at practices which may play a role in decreasing the risk of infectious disease.

Everyone is responsible for managing biosecurity risks that are under their control and that they know about or should reasonably be expected to know about. Individuals and organisations whose activities pose a biosecurity risk must take all reasonable and practical steps to prevent or minimise biosecurity risk, minimise the likelihood of causing a 'biosecurity event', limit the consequences if such an event is caused, and not do anything that might make any harmful effects worse.

Control of infectious disease is an important concern for all rehabilitators and veterinarians. As well as adversely affecting the welfare and health of the infected animal, infectious diseases can be transmitted to:

- rehabilitators and other close human contacts
- other wildlife in care
- domestic animals, including pets
- wild animals living at the release site.

By maintaining excellent standards of biosecurity as outlined in this section, rehabilitators safeguard the wellbeing of wild populations as well as animals in care, as diseases that are a risk during rehabilitation may not be present in wild populations.

Infectious organisms may be present in both living and dead animal material, including carcasses, faeces, fur, hides, blood, urine and other bodily fluids. Transmission can occur:

- by inhalation for example *Chlamydia* transmitted by inhaling aerosolised droplets containing bacteria exhaled by an infected bird
- by ingestion for example *Salmonella* transmitted by the faecal-oral route
- via skin or mucous membrane for example ringworm fungus by direct contact with skin lesions

- via placenta or maternal milk for example toxoplasmosis in pregnant humans
- by vector transmission via bite of insect, tick or mite for example Ross River virus
- by a bite, scratch, needle stick or wound contamination for example Australian bat lyssavirus.

All wildlife should be handled with the assumption that they are carrying infectious disease, especially if they appear sick.

Any animal that is suspected of suffering from an infectious disease should be examined by a veterinarian before being released back into the wild. Veterinarians can also provide advice on the development of wildlife biosecurity programs or protocols.

In the absence of information on disease risk, the precautionary principle should be applied. If there is a suspicion that an interaction or situation with wildlife may pose a disease risk (to other wildlife, domestic animals or humans), a risk is assumed (and managed appropriately) until proven otherwise. For example, we assume any reptile (sick or healthy) may be shedding *Salmonella* in its faeces, even though no tests have been conducted; or we assume any bat may be infected with Australian bat lyssavirus.

Any rehabilitator that becomes unwell should seek medical advice immediately and advise their doctor that they care for sick, injured and orphaned wildlife and could have been potentially exposed to a zoonotic disease (diseases transferred from animals to humans).

The Wildlife Health Australia (2018) *National Wildlife Biosecurity Guidelines* are the most comprehensive and thorough guidelines for infectious disease information and biosecurity (at the time of publication). They can be found at https://www.wildlifehealthaustralia.com.au/Portals/0/Documents/ProgramProjects/National_Wildlife_Biosecurity_Guidelines.PDF

4.1 Identifying and reporting infectious disease in wildlife

Sick wildlife which come into temporary care for rehabilitation can provide invaluable information on the presence of infectious diseases – both known and previously unknown – in free-ranging wildlife populations. Wildlife rehabilitators may develop a broad understanding in identifying signs of commonly seen diseases. This makes the sector vitally important in the overall surveillance for the emergence of new diseases, which may have a significant impact on conservation or may pose a threat to human and domestic animal health.

Wildlife rehabilitators and veterinarians should be aware of their roles in disease surveillance and have a good understanding of what to do when unusual clinical signs or unexpected mortality occurs.

Some of the signs which may be suggestive of infectious disease include:

- The animal is very thin, and appears to have been in poor condition for some time
- Poor coat or feather condition (dry, brittle, matted coat or patchy fur/feather loss)
- Signs of diarrhoea (soft, wet faeces around tail or stuck to fur/feathers)
- Large numbers of external parasites (ticks, fleas, mites, lice, flat flies)
- Discharge (clear or cloudy) from eyes, nostrils or ears
- Sneezing, coughing, noisy breathing or heavy breathing (when the animal is calm and not stressed)
- Large number of open wounds (some may look old and infected)
- Neurological signs (seizures, tremors, incoordination, paralysis, unusual eye movements)
- Mass mortality – unexpected numbers of animals are found dead or dying in the wild
- Disease outbreak – previously well animals in care become sick with the same symptoms.

All of these are indications that a veterinary health examination is required. Veterinarians are encouraged to contact the state Wildlife Health Australia (WHA) coordinator for advice on infectious diseases in wildlife: <https://www.wildlifehealthaustralia.com.au/AboutUs/ContactDetails.aspx>

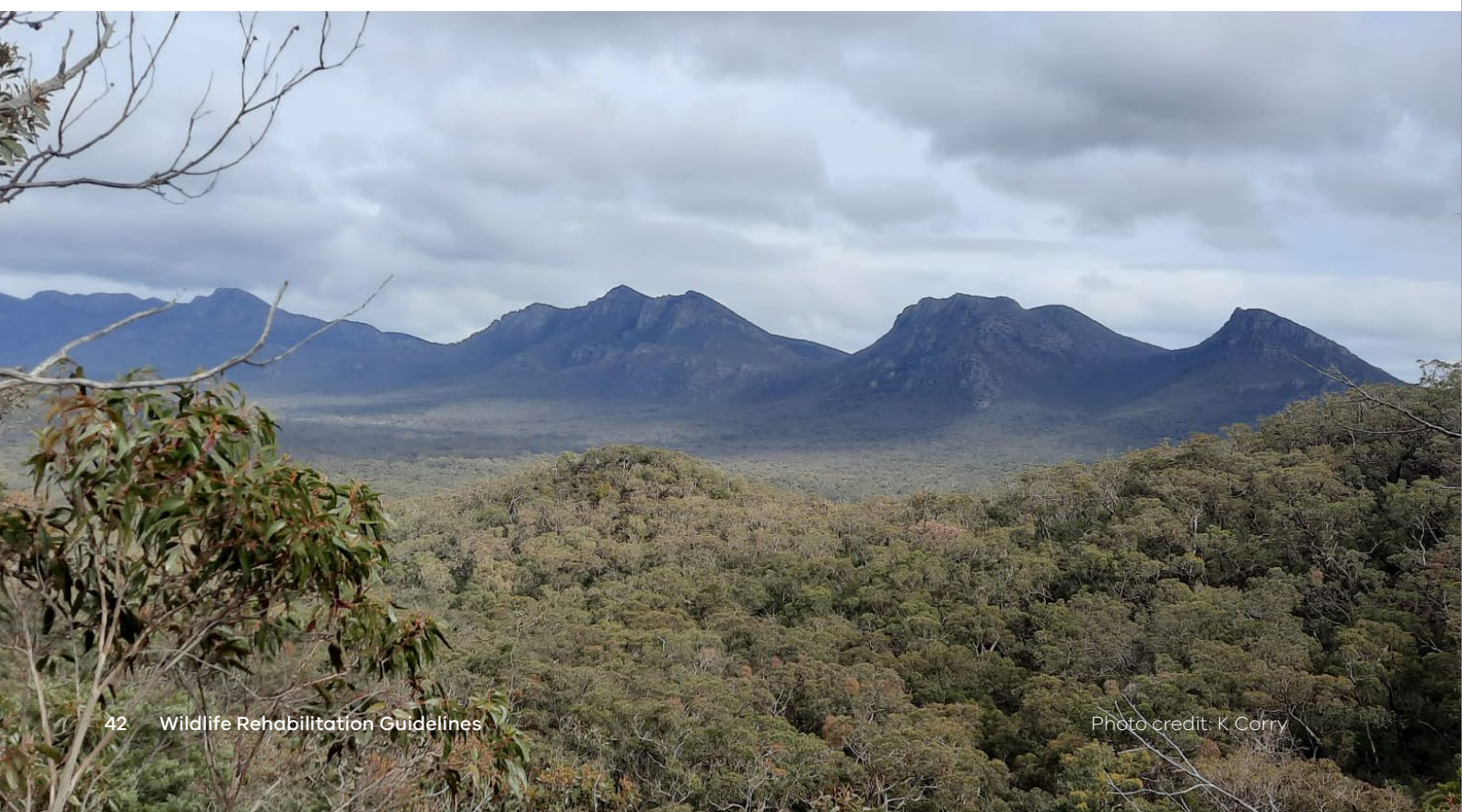
Funding is available for the investigation of unusual or mass mortality events in wildlife by registered veterinarians: <https://www.wildlifehealthaustralia.com.au/ProgramsProjects/NSDIProgram-Funding.aspx>

Diagnosis and further investigation are assisted by excellent record-keeping. Photographs and video of unusual behaviour is more useful than a verbal description. Wildlife rehabilitators should provide the following information to the veterinarian:

- Name and contact details of the person who found the animal
- The time, date, location and habitat in which the animal was found
- Species, weight, size, sex, age, reproductive status (pregnant, lactating) and physical condition
- Cause of death/method of euthanasia if the animal is deceased
- Medications used: name, dose rate, number of doses given and an objective assessment of the animal's response to treatment
- Mobility (for example limb and tail function)
- Sensory function (for example response to sound and light)
- Nervous system function (for example response to gentle shaking, lack of balance, lack of coordination)
- Any other signs of illness, disease or injury.

Australia has a well-developed wildlife health surveillance system and any unusual signs of disease or deaths in wildlife can be reported to your local State/Territory WHA Coordinator (see www.wildlifehealthaustralia.com.au), the 24-hour National Emergency Animal Disease Watch Hotline on 1800 675 888, your local veterinarian, or the Department of Primary Industry or Agriculture in the state or territory in which the event occurred.

A standard wildlife incident submission form, available from Wildlife Health Australia (WHA) (www.wildlifehealthaustralia.com.au) can be used for recording and submitting information. The Australian Registry of Wildlife Health provides information and protocols for disease investigation in wild birds: <https://wildlifehealthaustralia.com.au/Resources/TabId/161/ArtMID/821/ArticleID/61/Sick--Dead-Bird-Health-Surveillance.aspx>



4.2 Biosecurity and hygiene – minimising disease transmission

Wildlife rehabilitators and veterinarians can apply sensible protocols to minimise the risk of disease spread between wildlife patients, from wildlife to domestic animals, and from wildlife to people.

A practical approach to biosecurity includes:

- Excellent personal hygiene
- Appropriate use of personal protective equipment (PPE)
- Vaccination, appropriate for the animal species encountered (more information is available in the Australian Immunisation Handbook <https://immunisationhandbook.health.gov.au>)
- Protection against biting insects and ticks that may transmit disease
- Strict environmental hygiene and effective disinfection protocols
- Separation between wildlife patients within the shelter
- Separation between domestic pets and livestock and the wildlife shelter
- Effective pest control
- Rapid identification of, and response to, infectious diseases in wildlife
- Working from lower biosecurity risk to high biosecurity risk areas, that is servicing individuals with no abnormal clinical signs before those that are showing signs of infectious disease
- **Non-endemic native species** that have inadvertently travelled interstate in produce boxes or other containers must not be released into the wild as survival chances are low and they may spread disease. An authorised officer of DEECA should be contacted to determine the best course of action for the animal
- **Exotic species** must be euthanised as they are a pest and pose a threat to many native species. It is illegal to be in possession of such species. Notify Agriculture Victoria of stray, captured or surrendered exotic animals on 136 186 or email highrisk.invasiveanimals@agriculture.vic.gov.au

4.2.1. Personal hygiene

Hand washing is the single most effective way of minimising infectious disease spread. Wash hands thoroughly with soap and hot/warm water and then rinse and dry completely:

- before eating, drinking and smoking
- before preparing and handling animal or human food
- after cleaning equipment, surfaces or the work environment
- between contact with different groups of animals
- after handling animals and/or their products.

Avoid visitors to areas housing wildlife. Noise and large numbers of people are stressful for wild animals in captivity, and increased interactions between people and wild animals increases the risk of pathogen transfer. Any visitors must follow the same personal hygiene protocols as the carers.

Hand Hygiene

Hand washing refers to the use of soap and water to remove dirt and other organic matter. Following hand washing, disinfection, using hand sanitiser, is used to kill infectious organisms which may remain after hand washing is complete.

- **Hand washing:** Wash hands for 20 seconds using soap and warm water, making sure you clean all hand surfaces and under the fingernails (singing the 'happy birthday' song through twice takes approximately 20 seconds). Rinse with clean water, and air dry or use a clean piece of paper towel. Avoid the use of fabric hand towels, which remain damp and harbour infectious organisms, increasing the risk of transfer between people.
- **Hand sanitising:** Use >60% ethanol hand sanitiser to disinfect hands only after they are visibly clean.

- **Disposable gloves:** Use when handling faeces, blood, deceased animals, and any potentially infectious material. Gloves are not a substitute for good hand hygiene.

Clothes and shoes

Ideally, all wildlife rehabilitators and volunteers should change into dedicated clothing and shoes when they enter the wildlife care area of the wildlife shelter. Clothes and shoes worn while handling wildlife or cleaning wildlife enclosures should not be worn elsewhere and should be washed regularly, particularly if visibly soiled or wet. This is even more important when the animals in care have been diagnosed with, or are suspected of carrying, an infectious disease.

A dedicated hand wash area with lockers or hooks for carers and volunteers to hang/store clean 'outside' clothes and clean 'work' clothes helps everyone to maintain this barrier.

Eating and smoking

No eating or smoking should be allowed near animals, when preparing food, cleaning enclosures or handling waste. Aside from the detrimental impact of smoke to animals in care, these actions encourage people to put their hands near their face and mouth, increasing the risk of infection.

Bites and scratches

All wildlife shelters should have a well-stocked first aid kit, and ideally at least one shelter member should be first aid trained. All wild animals potentially carry infectious diseases which can cause serious disease in people. Animal bites often become infected due to the bacteria, which are transferred into the bite wound. Without attention, bite wounds can rapidly worsen, becoming swollen and sore, and potentially leading to sepsis (systemic bacterial infection). Never ignore bite wounds, regardless of how small the wound appears – always seek medical attention as soon as possible.

Some diseases can be fatal in humans, an example of this is Australian bat lyssavirus (ABLV). Exposure can occur through an animal bite or scratch from a bat, or by direct contact of the virus with the mucosal surface of a person, such as eye, nose or mouth. If bitten, scratched or exposure is suspected, seek immediate medical

attention. Wash the wound/area thoroughly in hot, soapy water for at least 15 minutes. Use an anti-viral antiseptic, such as povidone-iodine, iodine tincture or aqueous iodine solution.

Refer to the Australian Immunisation Handbook for more information on pre-exposure vaccination at <https://immunisationhandbook.health.gov.au> and also Lyssavirus (ABLV) - vaccine, treatment and symptoms | healthdirect which includes instruction on how ABLV is treated and if you are bitten or scratched by a bat in Australia, what you should immediately do.

4.2.2. Separation between wildlife patients and domestic animals

Domestic animals including farm animals and pets, such as dogs and cats, can be hosts for diseases that can be fatal for wildlife. For example, cats can carry *Toxoplasma gondii* and dogs can carry hydatid tapeworm (*Echinococcus granulosus*). Contamination of grass or dry feed, such as hay or pellets, with cat or dog faeces can result in the transmission of these diseases. All carers of animals have a responsibility to not only protect the animals in their care from disease, but also protect wild populations from exposure to disease.

To ensure a high level of animal welfare, wild animals must be housed in such a way that they cannot see, hear or smell domestic animals. This is particularly important for animals that are being hand reared in order to preserve their fear of domestic animals and minimise the possibility of habituation to them. All wild animals in care will be experiencing a high level of stress associated with captivity, this is in addition to the stress related to the injury or illness the animal is suffering from. Proactively minimising the level of stress the animal's experiences while in care is imperative to the animals recovery. Underlying and sustained stressful situations can have detrimental impacts on animals, as it can in humans.

Wild birds must be housed in a separate air space (that is a separate room) to domestic birds as serious diseases can be transmitted between the two groups as aerosols (in small droplets via the air).

Wild reptiles should not be housed in the same room as pet reptiles, or in enclosures that have previously housed pet reptiles. Pet lizards and snakes can carry diseases that are not seen in wild populations. Snake mite is a common parasite that is very mobile and can easily be transmitted between animals in different enclosures. These mites can carry bacterial and viral diseases.

Biosecurity and new arrivals

Sick, injured or orphaned animals may need to be treated immediately on arrival. However, they must be held separately from each other and from animals already in care prior to a health assessment to help avoid disease transfer. Exceptions include littermates, such as possums or nestlings, which may benefit from being kept together.

Newly admitted animals should undergo a thorough health assessment, ideally this should be performed by a veterinarian. If this is not possible, guidelines on how to conduct a visual and physical examination along with tables of common conditions are presented in the individual species chapters in Part B of these guidelines.

Individuals that show signs of disease that are potentially infectious, such as diarrhoea, should be housed separately from other animals, ideally in a different room, to prevent disease transmission to healthy animals. A vet assessment is required to determine the cause of the illness and if treatment is prescribed, the animal should be kept separate from other animals until the veterinarian determines that the disease has been resolved.

It should not be assumed that animals are disease free. Biosecurity considerations should be taken into account when housing animals. Shelter housing should allow for species to be housed separately from others of the same species and, throughout care, be monitored for signs of illness.

Animals of the same species should not automatically be housed together. Species natural history and behaviour should be understood as some species do not tolerate being in close proximity to others of the same species. Males and females should never be housed together. Consideration should always be given to the origin location of individuals. Housing animals from different origins together also poses a disease risk. Animals from different populations are not necessarily of the same disease status. This is also the reason why animals should always be released at or as close to the location found.

4.2.3. Effective pest control

All shelters should maintain a pest control program to ensure diseases are not inadvertently transferred to wildlife in care.

- **Rats and mice:** can carry and transmit leptospirosis and other zoonotic diseases via contamination of feed with faeces or urine. Rats and mice should be controlled by sealing any potential entry points to buildings and enclosures, removing leftover food and humane trapping.
- **Insects (for example flies and mosquitoes):** can transmit diseases such as poxvirus and blood parasites via bites. They should be controlled by using cages with screens that prevent access. If this is not possible, an insecticide can be used. If using insecticides avoid any contact with human or animal food or water and the wildlife themselves.
- **Wild birds:** should not have access to the food and water containers of any animals in rehabilitation. Place food and water bowls under a solid roof to protect them from faecal contamination by wild birds. Make sure that excess seed is not offered to rehabilitated animals and do not use wild bird feeders in areas where rehabilitated animals are housed.

4.2.4. Environmental hygiene and disinfection

Cages, enclosures and the structures holding them (racking) must be made of non-porous materials such as metal or plastic. It is important that all enclosures and equipment are cleaned and disinfected regularly to prevent the transfer of disease.

Clean cages and enclosures

To reduce the risk of disease transmission, all cages and enclosures should be cleaned daily as follows:

1. Good hand hygiene should occur at the start and end of cleaning activities.
2. Put on personal protective equipment such as rubber gloves and a surgical or N95 mask to minimise aerosol inhalation.
3. Remove the animal from the cage (this provides an opportunity for weighing, assist feeding and medicating the animal).
4. Remove food and water bowls and other cage furniture including newspaper and bedding.
5. Commence cleaning by washing and scrubbing walls and floors with soap/detergent and hot water to remove dirt, faeces and uneaten food.
6. Apply a disinfectant (for example F10SC) at the concentration indicated on the label and leave for the time period indicated to kill infectious agents. When sick wildlife is involved, cloth bags should be soaked in a disinfectant such as F10SC and washed. Cardboard boxes should be burned or placed in the rubbish bin.
7. Wipe, dry and expose all equipment to sunlight wherever possible.
8. Replace substrate, bowls, cage furniture and then return the animal.
9. Once the animal has left care, a thorough clean should be performed, followed by disinfection of surfaces and, if possible, cages rested between individuals.

Large aviaries should have faeces removed by daily spot cleaning. At the end of an individual's stay, perches should be replaced, the substrate raked and turned or replaced, and nest-boxes cleaned or replaced. If an animal stays for an extended period, scrubbing of perches and nest-boxes should be undertaken during the animal's stay as required.

Cleaning items like buckets, scrubbing brushes, mops and cloths should only be used for cleaning animal enclosures and not for cleaning areas used by humans. Dedicated cleaning equipment should be used for sick animals and should be stored separately from equipment used for other animals.

Clean yards

Yards should have faeces removed daily. Particular attention should be paid to removing faeces from areas where the animal is fed. It may be beneficial to concrete high traffic areas near gates or feed-stations to allow more intensive cleaning and disinfection.

Avoid transferring faeces and other waste from one enclosure to another on the soles of shoes. Check or change shoes before leaving each enclosure. Minimise dust and aerosols in animal housing areas.

Clean food and water bowls and other equipment

Food and water bowls and all other equipment (for example nets, bags, scales, callipers and scissors) should be cleaned and disinfected after each use as follows:

1. Good hand hygiene should occur at the start and end of cleaning activities.
2. Rinse all bowls and bottles in cold water immediately after use.
3. Wash in hot soapy water, paying particular attention to remove all residues from the surface.
4. Rinse in hot water.
5. Place the item into a disinfectant solution for the required time. Suitable disinfectants effective against bacteria, fungi and viruses include bleach and F10SC. Make up to the manufacturer's recommendations and use for the stated length of time. Bleach must be thoroughly rinsed off all items.
6. Wipe, dry and expose to sunlight wherever possible.

Dirty animal bowls and other equipment should not be cleaned in areas used for human food preparation. For example, the laundry sink should be used rather than the kitchen sink.

Separate foodstuffs

It is preferable to have a fridge or freezer dedicated to animal food items. However, if animal food needs to be stored in the human food fridge or freezer, make sure the animal food items are packaged securely in airtight containers and labelled clearly as animal food. This will reduce the risk of disease transmission from human to animal food and vice versa.

4.2.5. Managing risks of inappropriate use of antimicrobial medications

There are risks involved with inappropriate use of antimicrobial medication in wildlife which include:

- development of antimicrobial resistance
- potential toxic or deleterious effects on the individual
- a failure to effectively treat infectious or non-infectious diseases.

The general principles of antimicrobial stewardship should be applied equally to their use in wildlife (see www.safetyandquality.gov.au/our-work/healthcare-associated-infection/antimicrobial-stewardship/book and the WHA fact sheet 'Antimicrobial resistance and Australian wildlife' https://www.wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Multiple_groups/Antimicrobial_Resistance_and_Australian_Wildlife.pdf)

Antimicrobial medication should only be administered to wildlife on an individual basis, following individual examination, diagnosis and prescription by a registered veterinarian.



Photo credit: [unreadable]

4.3 Zoonoses – risks to human health

Zoonoses are diseases that can be transmitted from animals to humans. As rehabilitators and veterinarians are in regular contact with wild animals, there is heightened potential for zoonotic disease transmission. The risk increases if the rehabilitator or veterinarian is pregnant, has a compromised immune system or is elderly. Some zoonoses are fatal to humans. Medical practitioners have a requirement to report cases of certain diseases to the Victorian Department of Health.

Key points:

If unsure about the risk of zoonotic disease it is necessary to contact a medical practitioner. It also may be useful to proactively discuss risks and protective options, such as vaccination, with your general practitioner as part of your self-care plan.

Always seek immediate medical advice if anyone becomes ill and always report unexplained or persistent illness (for example intestinal, respiratory or skin problems) to a medical practitioner.

The simplest way to minimise the risk of exposure to a zoonotic disease is to practise good hygiene (as described above) and wear appropriate personal protective equipment (PPE). It is also recommended that wildlife rehabilitators keep certain vaccinations current:

- **Tetanus:** see a medical practitioner for the recommended frequency.
- **Rabies:** vaccinations are strongly recommended if rescuing or handling bats. Blood testing to determine that adequate titres are maintained is recommended every two years. (Refer to Part B, Chapter 4. Flying foxes and Chapter 7. Microbats).

- **Q fever:** seek testing and vaccination if rescuing and caring for marsupials.
- Refer to <https://immunisationhandbook.health.gov.au>.

Zoonoses that may be contracted from wildlife are discussed below. This list is not exhaustive and consultation with a medical practitioner is essential if there are any concerns. Additional information is available in the Wildlife Health Australia fact sheet 'Infectious diseases of biosecurity concern in Australian wildlife': https://www.wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Multiple_groups/Infectious_diseases_of_biosecurity_concern_in_Australia.pdf

4.3.1. Sarcoptic mange

Sarcoptes scabiei is a mite that may be transmitted to humans from mammals, most commonly from infected wombats and koalas. In humans, symptoms may include a red, slightly raised, itchy rash, commonly seen on the arms, legs and abdomen. Direct contact with an infected animal is usually required for transmission to humans. Mites can live in the environment for up to three weeks and reinfestation is possible, so treatment of clothing and bedding must also be undertaken. Seek medical attention. Refer to <https://www.healthdirect.gov.au/scabies>

4.3.2. Ringworm

Ringworm is caused by a fungus, usually either *Microsporium canis* (found on animal fur) or *Trichophyton* (a soil fungus). In infected humans, the affected area of skin may appear red, itchy, raised and circular. Direct contact with animal hair or items is usually required for transmission to humans. Seek medical advice. Refer to <https://www.healthdirect.gov.au/ringworm>

4.3.3. Bacterial infection of skin wounds (for example *Pasteurella*)

Bite and scratch injuries may occur when handling wildlife. This may result in the inoculation of bacteria, such as *Pasteurella*, into skin wounds, which may lead to swelling, pain, redness, fever and an inability to move the affected area. All wounds should be washed with soap and water and immediate medical advice sought.

4.3.4. Psittacosis

Caused by the bacterium, *Chlamydia psittaci*, which is found in most wild bird species but especially parrots, waterfowl, pigeons, doves and lyrebirds. This is not the same disease as koala chlamydiosis (there are currently, at the time of publication, no reports of koala chlamydiosis infecting people) or human genital chlamydiosis. Affected birds may appear depressed, thin and have difficulty breathing. However, they can also carry the organism without showing any clinical signs. Transmission to humans is usually by inhalation of organisms that have been shed in the faeces or discharges of infected birds, or following sweeping or the use of high pressure hoses to clean enclosures. General symptoms in humans can include fever, headache, loss of appetite, muscle pain, photophobia and a dry cough. Seek immediate medical advice. Refer to <https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/psittacosis-parrot-fever>

4.3.5. Q fever

Caused by the bacterium, *Coxiella burnetii*. A number of marsupial species can carry the bacteria without evidence of clinical infection. Transmission to humans is by inhalation of aerosols from faeces, urine, blood and birth fluids. The organism is able to persist in the environment

for a long period of time. General symptoms in humans can include development of a fever, rash, headache, muscle pain, cough and fatigue. Seek medical advice. Refer to <https://www.healthdirect.gov.au/q-fever>

4.3.6. Leptospirosis

Caused by *Leptospira* bacteria, which can be found in the urine of possums, flying foxes and introduced rodents. Transmission is by inhalation of aerosolised urine or by urine penetrating open wounds and scratches. General symptoms in humans include fever, headache, muscle pain, chills, vomiting and red eyes. Seek immediate medical advice. Refer to <https://www.healthdirect.gov.au/leptospirosis>

4.3.7. Gastrointestinal bacteria and protozoa

A number of different bacteria including *Salmonella*, *Campylobacter* and *Yersinia*, and protozoa such as *Cryptosporidium* and *Giardia* can be transmitted from animals to humans and cause gastrointestinal disease in humans. Symptoms in humans may include vomiting, diarrhoea, cramps and bloating. Seek medical advice. Refer to <https://www.healthdirect.gov.au/gastroenteritis>

4.3.8. Australian bat lyssavirus (ABLV)

Australian bat lyssavirus (ABLV) is a virus related to the rabies virus. ABLV has been found in all species of flying foxes and the yellow-bellied sheath-tail bat (*Saccolaimus flaviventris*). However, it should be assumed that all bat species are potential hosts. It is important to note that national surveillance for ABLV is passive, there is no ability to screen live animals for the virus, therefore prevalence is unknown. Transmission to a human from an infected animal is through an animal scratch or bite that breaks the skin, or by direct contact of the virus with the mucosal surface, such as the nose, eye or mouth. Symptoms in humans may include convulsions, paralysis, coma and death. If bitten, scratched or exposure is suspected, seek immediate medical attention. Wash the wound/area thoroughly in hot, soapy water for at least 15 minutes. Use an anti-viral antiseptic, such as povidone-iodine, iodine tincture or aqueous iodine solution.

All suspected cases of ABLV in injured or sick bats or other animals (such as pet dogs, cats or horses) should be reported to Agriculture Victoria, via the Emergency Animal Disease Watch Hotline on 1800 675 888 and investigated by a veterinarian.

All human exposures are to be reported to the Department of Health by a qualified medical practitioner within five days.

Refer to <https://www.healthdirect.gov.au/lyssavirus-ablv> and <https://immunisationhandbook.health.gov.au/contents/vaccine-preventable-diseases/rabies-and-other-lyssaviruses> and https://wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/mammals/Australian_Bat_Lyssavirus.pdf

4.3.9. Ross River virus

This virus is transmitted by mosquito bites. Eastern grey kangaroos and wallabies may carry the virus without showing clinical signs. A mosquito that bites an infected eastern grey kangaroo or wallaby, may bite a human and transmit the virus. Symptoms in humans can include a rash on the trunk and limbs, chills, fever, headache, lethargy and muscle tenderness. Seek immediate medical advice. There is no specific treatment, although the doctor will be able to advise on medications to help ease the discomfort of the symptoms. Refer to <https://www.healthdirect.gov.au/ross-river-virus>

4.3.10. Toxoplasmosis

Caused by *Toxoplasma gondii*, a protozoan parasite. Cats are the definitive host and pass the organism in the faeces. Other animals can also be infected but do not shed organisms in the faeces. Transmission to people is generally by the ingestion of material contaminated with cat faeces or by the consumption of poorly cooked meat from infected animals. Symptoms in humans may range from no clinical signs to severe clinical disease, seek medical advice. Refer to <https://www.healthdirect.gov.au/toxoplasmosis>

4.3.11. Allergies

While not a zoonosis, exposure to allergens from animal or plant particles found on the fur, feathers and/or moldy hay may cause immune reactions in humans. Symptoms in humans depend on the severity of the allergy. Seek medical advice. Refer to <https://www.healthdirect.gov.au/allergies-and-hypersensitivities>

Mode of transmission is unknown, but may be via a bite wound from an infected animal or by a biting insect.

4.3.12. Buruli ulcer

The buruli ulcer is a bacterial skin disease that can cause ulcers in humans, pets, livestock and wildlife. Possums seem to be highly susceptible to this disease, and severe infections can seriously impair their health and welfare. Refer to [Mycobacterium_ulcerans_disease.pdf](#) (wildlifehealthaustralia.com.au).



Appendix

Hand-raising Record-keeping Template

Species: _____ Name: _____ Approx. Age: _____

Date: _____

Weight: _____

Feed time	Food/ Milk	Amount	Supplements	Amount	Urine	Faeces	Consistency	Comments and Medication

Date: _____

Weight: _____

Feed time	Food/ Milk	Amount	Supplements	Amount	Urine	Faeces	Consistency	Comments and Medication

Date:

Weight:

Feed time	Food/ Milk	Amount	Supplements	Amount	Urine	Faeces	Consistency	Comments and Medication

Date:

Weight:

Feed time	Food/ Milk	Amount	Supplements	Amount	Urine	Faeces	Consistency	Comments and Medication

Record Keeping Template for Visual and Physical Observations, Feeding and Medication

Species:		Name:		
Date acquired: / /	Sex:	Age:		
Capture site:		GPS/Map reference:		
Location description:				
Reason for coming into care:				
Date & time				
VISUAL ASSESSMENT				
Demeanour				
Behaviour				
Gait and Posture				
Breathing				
PHYSICAL ASSESSMENT				
Body weight				
Body condition				
Hydration status				
Eyes				
Ears				
Nostrils				
Mouth				
Skin/Fur/Feathers				
Left Fore/Wing				
Right Fore/Wing				
Left Hind				
Right Hind				
Tail				

FEEDING								
Amount Offered								
Amount Eaten								
Faecal/Urine Output: Amount and Consistency								
MEDICATION								
Medication and Amount	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon

Species:			Name:		
Date acquired: / /		Sex:		Age:	
Capture site:		GPS/Map reference:			
Location description:					
Reason for coming into care:					
Date & time					
VISUAL ASSESSMENT					
Demeanour					
Behaviour					
Gait and Posture					
Breathing					

PHYSICAL ASSESSMENT								
Body weight								
Body condition								
Hydration status								
Eyes								
Ears								
Nostrils								
Mouth								
Skin/Fur/Feathers								
Left Fore/Wing								
Right Fore/Wing								
Left Hind								
Right Hind								
Tail								
FEEDING								
Amount Offered								
Amount Eaten								
Faecal/Urine Output: Amount and Consistency								
MEDICATION								
Medication and Amount	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon

Photo credit: Melinda Corry



