Department of Environment & Conservation
Wildlife Rehabilitator's Consultation Group

Minimum Standards for Wildlife Rehabilitation in Western Australia 2008

Department of
Environment and Conservation
Our environment, our future

Minimum Standards for Wildlife Rehabilitation in Western Australia

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The first edition of Minimum Standards for Wildlife Rehabilitation has resulted from the suggestions and contributions of many wildlife rehabilitators via consultation. This edition was compiled by Michelle Rouffignac, RVNAVN, Nursing Supervisor, Perth Zoo, whilst on secondment with the Department of Environment and Conservation.

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CODE OF ETHICS

A Wildlife Rehabilitator's Code of Ethics

1. A wildlife rehabilitator should strive to achieve high standards of animal care through knowledge and an understanding of the field. Continuing efforts must be made to keep informed of current rehabilitation information, methods and regulations.

2. A wildlife rehabilitator should be responsible, conscientious and dedicated, and should continuously work toward improving the quality of care given to wild animals and birds undergoing rehabilitation.

3. A wildlife rehabilitator must abide by local, state and federal laws concerning wildlife, wildlife rehabilitation and associated activities.

4. A wildlife rehabilitator should establish safe work habits and conditions, abiding by current health and safety practices at all times.

5. A wildlife rehabilitator should acknowledge limitations and enlist the assistance of a veterinarian or other trained professional when appropriate.

6. A wildlife rehabilitator should respect other rehabilitators and persons in related fields, sharing skills and knowledge in the spirit of cooperation for the welfare of all fauna.

7. A wildlife rehabilitator should place optimum animal care above personal gain, with the primary goal to rehabilitate wildlife for release back into the wild within the natural range of that species.

8. A wildlife rehabilitator should strive to provide professional and humane care in all phases of wildlife rehabilitation, respecting the wildness and maintaining the dignity of each animal in life and in death. Releasable animals and birds should be maintained in a wild condition and released as soon as appropriate. Non-releasable animals and birds that are inappropriate for remaining in captivity should be euthanased.

9. A wildlife rehabilitator should encourage community support and involvement through volunteer training and public education. The common goal should be to promote a responsible concern for living beings and the welfare of the environment.

10. A wildlife rehabilitator should work on the basis of sound ecological principles, incorporating appropriate conservation ethics and an attitude of stewardship.

11. A wildlife rehabilitator should conduct all business and activities in a professional manner, with honesty, integrity, compassion, and commitment, recognising that an individual's conduct reflects on the entire field of wildlife rehabilitation.

FOREWORD

Western Australia is one of the most biologically diverse regions in the world. The south-west of WA is one of the world's 34 internationally recognised terrestrial hotspots for biodiversity and the only one recognised in Australia.

The State comprises a 2.5 million square kilometre mainland; more than 12,800 kilometres of coastline, over 20,700 kilometres when island coastlines are included; more than 3,700 offshore islands; 26 of Australia's 80 bioregions, from sub-alpine areas to tropical rainforest and desert; 141 of Australia's 207 mammal species, 25 of which are unique to WA; 439 reptile species, 187 of which are unique to WA; and 518 of the 760 bird species recorded in Australia, 14 of which are unique to WA.

Natural and human induced events often lead to sick, injured and orphaned native animals. It is necessary to ensure that the welfare of sick, injured and orphaned native animals is dealt with in a humane way. The management of injured wildlife is a shared responsibility across the community. Rehabilitators, however, are special people who volunteer to assist in the recovery of sick, injured and orphaned wildlife so that they can be returned to the wild. Hundreds of people across WA perform this valuable community service.

To assist rehabilitators in this task, the Department of Environment and Conservation is pleased to provide these *Minimum Standards for Wildlife Rehabilitation in Western Australia.*

This document reflects many years of knowledge and experience from volunteer wildlife rehabilitators and veterinarians in the care and rehabilitation of sick, injured and orphaned wildlife. The *Minimum Standards* are based on accepted veterinary practices, personal observations, common sense, good judgement and many thousands of hours of dedicated commitment. The document will be reviewed and updated periodically as new techniques become available. I encourage all wildlife rehabilitators and other interested parties to provide feedback and comments for consideration in future editions.

The *Minimum Standards* represent a new benchmark for wildlife rehabilitation. I am sure they will provide very useful guidance for rehabilitators and associated organisations. The Wildlife Rehabilitators Code of Ethics is an integral part of these standards that incorporate the principles of high standards of animal care, responsibility, integrity, compassion, safe working environments and professionalism.

I am very pleased to present the *Minimum Standards for Wildlife Rehabilitation in Western Australia* and commend it to all wildlife rehabilitators.

Keiran McNamara

Keiran McNamara
DIRECTOR GENERAL
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STATEMENT OF PURPOSE

The Department of Environment and Conservation (DEC), Western Australia, is pleased to provide this endorsed Minimum Standards for Wildlife Rehabilitation (Minimum Standards). The purpose of these Minimum Standards is to ensure the welfare of native animals and birds in all stages of the wildlife rehabilitation process and maximise the potential to return native animals and birds to the wild.

Wildlife rehabilitation is defined as the temporary care of sick, diseased, injured or orphaned wildlife, for the purpose of caring for it until it recovers or becomes capable of fending for itself.

For the purpose of these Minimum Standards, wildlife/native animals and birds has the same meaning as fauna as defined in the Wildlife Conservation Act 1950, as amended – *any animal indigenous to any State or territory of the Commonwealth of Australia or the territorial waters of the Commonwealth, and any animal that periodically migrates to and lives in any State or territory of the Commonwealth or the territorial waters of the Commonwealth and any animal declared as fauna pursuant to the Act.*

These Minimum Standards are a cooperative effort that represents the most current knowledge, expertise and techniques in our field. They are a reflection of what we have learned collectively and have successfully applied. All rehabilitators are encouraged to explore and understand the principles underlying these standards, and to apply them in the everyday care of wild animals and birds. Minimum standards for wildlife rehabilitation apply not only to the facilities used for rehabilitation, but also to all aspects of the work involved.

The Minimum Standards is a document created by and for wildlife rehabilitators. This document is intended to help increase the number of rehabilitated wildlife that is successfully returned to wild populations by providing:

- recommendations and information regarding wildlife care;
- minimum standards for rehabilitation; and
- mechanisms for self evaluation.

These Minimum Standards do not apply to animals and birds kept beyond the normal scope of wildlife rehabilitation. Animals and birds that are kept for educational display, research or captive breeding purposes have different housing requirements based on the needs of the individual. Those specific needs are not addressed in this document.

The Minimum Standards is a living document that is updated constantly as the field of wildlife rehabilitation grows and improves. The procedures and cage sizes described herein have been provided by experienced wildlife rehabilitators, and are considered to be **MINIMUM** standards i.e. more detailed procedures or larger cages are certainly acceptable and encouraged. Because wild fauna undergoing rehabilitation are individuals, each with different needs based on injuries and unique behaviours, recommended cage sizes and techniques may not apply to every case. The wildlife rehabilitator is encouraged to improve techniques for housing, pre-release conditioning and other aspects of the rehabilitation process, so long as basic natural biology, comfort and hygiene needs are met. Cage dimensions can be modified to accommodate special needs of the facility, fauna or new advancements in the field.

This document is a foundation upon which each wildlife rehabilitator can build an appropriate and effective system. The goal is to give each animal or bird the best chance of post-release survival in its natural place in the wild. Wildlife rehabilitators should combine information from Minimum Standards, wildlife course material, current publications, veterinarians, experienced mentors and personal experience, along with common sense and good judgment to make the best decisions for each individual animal or bird. All rehabilitators are encouraged to improve upon these standards as they strive to provide the best possible care.

An effort should be made by the rehabilitator to obtain as much information as possible through reference and natural biology literature and contact with other rehabilitators. Through an understanding of each species' behaviour and natural biology, proper choices can be made to provide suitable temporary captive housing and habitats. All rehabilitators should be prepared to provide temporary housing for any species they are likely to encounter, including those species rarely encountered.

The Wildlife Conservation Act and Regulations govern the activities of wildlife rehabilitators in Western Australia. DEC has responsibility for implementation of that legislation and the policies that affect the management of wildlife. Wildlife rehabilitators are asked to ensure that they work with DEC in its efforts to manage sick, injured and orphaned wildlife in accordance with the legislation.

The Wildlife Rehabilitator's Code of Ethics is a part of these Minimum Standards and is based on the principles of honesty, integrity, responsibility and treating others as we would have them treat us. The Code of Ethics provides basic rules of conduct for each of us to incorporate into our practice. The resulting self-respect, peer respect, community respect and credibility will increase our effectiveness in animal care, networking, fund-raising, volunteer management, educational efforts and all aspects of wildlife rehabilitation. Ethical and professional conduct by each wildlife rehabilitator will also contribute significantly to the credibility of our field as a whole, which in turn, will benefit all of us. We are proud of this collaborative effort. We encourage all wildlife rehabilitators to actively use this document to help improve the care, treatment and successful release of wildlife.

This document will be reviewed in 2011. For comments please go to the www.naturebase.net website.

CHAPTER 1 - CHRONOLOGIC OUTLINE OF THE REHABILITATION PROCESS

The goal of this section is to provide a blueprint for successful rehabilitation and guide the rehabilitator through the care and clinical process.

(1) **Admission of the animal**

- Gather history from the person presenting the animal or bird
- Record all information
- Provide relevant educational material to the presenter
- Report any Specially Protected Fauna, poisoning or gunshot victims to DEC
- Follow any instructions from DEC regarding Specially Protected Fauna

(2) **Immediate Care of the animal**

- Evaluate the animal quickly when transferring to a holding box/pouch/cage etc.
- Examine for critical conditions and administer emergency care as needed
- Provide quiet rest space in a quarantine area, separated from domestic animals and pet birds, human traffic and potential irritants such as cigarette smoke
- Domestic animals must not be in proximity to any wildlife under care where its presence will interfere with its care.

(3) **Health Assessment**

- Weigh (there may be some reasonable limitations to weighing large animals)
- Visual exam
- Palpate limbs
- Examine whole of animal
- Assess nutritional status and body condition
- Visit to Veterinarian if required

(4) **Provision of Treatments**

- Provide fluids
- Manage wounds and/or injuries
- Administer medications
- Provide nutrition
- House in appropriate facility
- Employ appropriate techniques to minimise imprinting as required

(5) **Stage 1 - Intensive Care**

- Monitor weight
- Provide ongoing, appropriate nutrition
- Treat medical problems as needed
- Provide supportive housing and habitat

(6) **Stage 2 – Acclimatisation**

- Monitor weight
- Provide ongoing, appropriate nutrition
- Treat medical problems as needed (should be minimal)
- Climate acclimatisation
- Environmental acclimatisation

- Provide comfortable, appropriate housing and habitat with mental stimulation
- Minimise interaction with human activity
- Provide environmental physical therapy as needed

(7) **Stage 3 - Pre-Release Conditioning**

- Provide larger, outdoor housing to develop natural behaviours
- Monitor weight and general condition
- Minimise interaction with human activity
- Provide ongoing, appropriate nutrition, introducing a more natural diet
- Exercise daily, as appropriate for that species
- Soft/Hard Release Plan developed

(8) **Release Evaluation**

- No evidence of disease
- Ability to self feed e.g. forage, catch live prey
- Normal mobility and function, reasonable level of physical fitness and stamina necessary for foraging, breeding or territory defence behaviour if predicted
- Normal behaviour (the animal exhibits reasonable responses to human activity, predator avoidance, exhibits normal socialisation with both same and other species)
- Normal weight/condition for that species/sex/season
- Suitable release sites available
- Where authorisation is issued by DEC, the animal is identified for possible follow-up

(9) **Release**

- Appropriate habitat and within its natural range for that species.
- Choose appropriate season/time of year (migration, breeding season, etc.)
- Choose appropriate time of day
- Identify forecasted weather for suitability
- Provide food if appropriate
- Provide proper/safe transportation
- Monitor post-release if possible

WILDLIFE REHABILITATION "FACILITIES" REVIEW

Rehabilitation facilities and individual rehabilitators may benefit from doing a regular self-evaluation or self-review.

A form used to assist in this type of self-evaluation is found in Appendix A, Form 1. The purpose of this check list is to provide wildlife rehabilitators with a tool to use for checking the service they are providing to ensure wildlife receives appropriate housing and medical treatment, and to protect both wildlife and humans from disease and contamination by monitoring appropriate standards.

Not all items contained in the form will apply to everyone. For example, an independent rehabilitator working from home probably does not require a grievance committee - but this form does provide an easy reference to be sure important considerations are not overlooked when changes, such as facility growth, occur.

CHAPTER 2 - RECORDING AND REPORTING REQUIREMENTS

Records are a vital part of any rehabilitation program, and are particularly important when an individual or an organisation is trying to learn from previous work in an effort to improve the care given to wildlife. Records should be kept on all animal admissions.

Animal admission forms and animal examination forms can be used to ensure that vital information is gathered for each animal. An example of an Animal Admission Form is found in Appendix B, Form 2 and an example of a Bird Examination Form is found in Appendix C, Form 3**.** Records can be consolidated for healthy litters or clutches of animals and birds raised for release. Daily forms for animals and birds by enclosure or cage are required to verify that food, medications, and care are being provided. These records must be kept on file by the rehabilitator for future reference, should this be required.

All animals and birds (dead or alive) that indicate suspected poisoning or other criminal activity should be reported to DEC immediately upon acquisition.

All Specially Protected Fauna, as listed in the Wildlife Conservation (Specially Protected Fauna) Notice, published yearly in the Government Gazette must be reported to a DEC Wildlife Officer or the WILDCARE Helpline number within 72 hours. This list can be found on the State Law Website, or by contacting Nature Protection, Kensington for a current copy.

Pursuant to the Wildlife Conservation Regulations 1970, Section 57 "marking of wild fauna", and the Pet Herpetofauna Regulations, in conjunction with a Regulation 17 License to Take Fauna for Scientific Purposes, a current license is required from DEC to mark for identifying animals and birds post release. To make an application for a Regulation 23 Licence the rehabilitator must write a letter of request to the Administrative Officer, Wildlife Licensing Section. The applicant would have to demonstrate that they are sufficiently experienced and trained and that their research and proposed method or means of capturing and marking fauna are satisfactory. They would also have to demonstrate that they will collect the data on the outcome of the marking (sightings, microchip data) and make a report on this to DEC as part of a scientific research program.

If animals and birds are marked in any way, the rehabilitator is no longer 'caring for sick or injured fauna' (Regulation 28A.) but is conducting research. A rehabilitator must demonstrate to DEC that they have the expertise to do this and that it has scientific merit.

Record keeping has been placed in two categories:

- required information
- recommended information

Required Information

- Species, sex (if determined), age (estimate)
- Date admitted
- When and where found
- Name/address/phone number of finder
- Presenting injury/problem
- Initial weight
- Case or acquisition number
- Record of notifying DEC in cases of Specially Protected Fauna, including who was notified, when and by what method (phone, fax or e-mail)
- Record of notifying DEC in cases of animals and birds being shot, poisoned or falling victim to other illegal activity
- Final disposition:
  - i.e. released (including date, time & location)

- release weight
- transferred to whom (must supply name and address)
- placed with whom (must supply name and address)
- died, euthanased (disposal of carcase to WA Museum, DEC or buried/incinerated)

o Recipient information if transferred or placed:
  - name, address, permit number
  - purpose of transfer (including the transfer or placement of carcasses for educational purposes)
o Permanent identification details e.g. band, microchip, where applicable
o Any additional information required by DEC.

Recommended Information

o Any additional history that might be provided by the presenter (regarding cause of injury, severity or time of injury/problem, any care given by the presenter, etc.)
o Physical examination data
o Daily treatment information and ongoing notes
o Data regarding veterinary services (where applicable)
o In suspected poisoning cases, any additional information describing the site where the animal was found, climate, other species present, circumstances, etc.

CODING STANDARDS

Coding standards should conform to specifications listed. The code letters used by wildlife rehabilitators and rehabilitation centres should be strictly defined for comparison purposes. Referenced categories should correspond to the following:

R (RELEASED): Any healthy, recovered fauna that is returned to its natural habitat
Note: released animals and birds do NOT include transferred, placed or pending animals and birds.

T (TRANSFERRED): All transferred animals and birds must be recorded in the wildlife rehabilitator's records.

(1) Any animal transported to another facility or wildlife rehabilitator for further rehabilitation efforts. (Note: if the animal is known to have been released by the receiving facility, it is still recorded as a `T' by the original facility and as an `R' by the receiving facility).
(2) Any animal determined to be non-releasable while undergoing wildlife rehabilitation efforts that is placed in a non-rehabilitation situation.

NOTE: For Specially Protected Fauna, agency permission is ALWAYS required prior to transfer of live animals and birds. For long-term care of permanently incapacitated animals and birds the recipient must possess the proper approval and licence. Contact must be made with the local Wildlife Officer to confirm permission and/or approval.

For an individual centre's information, this can be further subdivided into (optional):

TR (TRANSFERRED FOR REHABILITATION)

P (PENDING): Any fauna still undergoing rehabilitation efforts. These animals and birds are only added to summary statistics after final resolution.

DIC (DIED IN CARE): Any fauna that dies subsequent to any handling, exam, treatment, or implementation of lifesaving measures in the care facility.

DOA (DEAD ON ARRIVAL): Any fauna that dies before any lifesaving measures or treatments can be implemented in the care facility.

EAC (EUTHANASED AFTER CARE): Any fauna that is suffering or non-releasable that is euthanased.

EOA (EUTHANASED ON ARRIVAL): Any fauna euthanased after an initial exam, without further treatment measures being done.

In the case of all Specially Protected Fauna, Nature Protection Branch DEC must be notified by phone, fax or email the first working day following the receipt of such an animal. Permanently incapacitated animals, i.e. physically or mentally impaired or imprinted animals, may not be suitable for release. Consultation with Nature Protection DEC is necessary to reach a decision in these cases.

VETERINARY POLICY

The Veterinary Practice Act 1996 precludes non-veterinarians from practicing veterinary surgery or veterinary medicine. In instances where surgery or medicine needs to be administered and veterinarians are not able to directly examine the animal, the rehabilitator should make every effort to obtain veterinary advice.

The legal prescription of medical care for sick or injured wildlife is the responsibility of a veterinarian. The veterinarian may delegate a portion of this responsibility to a rehabilitator by means of a formal mutual agreement in writing and submitted to the Veterinary Surgeons Board (VSB) for record and to refer to during a yearly audit of such agreements. The veterinarian must comply with the Veterinary Surgeons Regulation, 1979, 28A, 29 and 31 in relation to the prescription and supply of the drug(s).

Such an arrangement allows the veterinarian to prescribe a specific treatment protocol for a specific type of illness or injury without having to see each individual animal (e.g. the veterinarian may prescribe a certain antibiotic to be given at a specific dosage, frequency and duration for all cat attack victims). This type of arrangement also requires that an appropriate veterinarian/rehabilitator/wildlife animal relationship exists and has the following components:

- The veterinarian has assumed the responsibility for any medical judgments regarding the health of sick or injured wildlife and the need for medical treatments.

- Furthermore, the veterinarian has current personal knowledge of the general conditions and care of wildlife in the rehabilitator's care. This is to be achieved by:

  (a) medically appropriate and timely visits to the premises at which the wildlife is kept, or
  (b) timely transport of wildlife to the facility of the attending veterinarian

- The veterinarian and the rehabilitator must maintain a record of mutually agreed veterinary procedures and medications and a record of timely visits to the site. This is for the purpose of a yearly audit.

- If the veterinarian intends to keep and treat any animal for more than 24 hours, the animals and birds must be housed within the sizes stipulated in these Minimum Standards, in an area that is quiet and removed from domestic animals and human traffic.

- The veterinarian is available for follow-up in case of adverse reactions or failure of the current treatment.

- Any agreement must abide by the laws and regulations governing the practice of veterinary medicine.

FEASIBILITY AND FATE

Once an animal or bird comes into rehabilitation, it is faced with one of four fates; death from its injuries or illness, permanent confinement due to factors preventing release, successful rehabilitation and release, or euthanasia. This section addresses euthanasia.

Euthanasia may be a difficult task for the rehabilitator to perform. Where possible a Veterinarian should be consulted regarding the decision to euthanase. Fauna should not be considered for release if they are permanently incapacitated and not likely to survive in the wild. Incapacities include, but are not limited to, being vision impaired, amputated or poorly healed broken limbs, imprinting, or having a high likelihood of infecting wild animals and birds with disease. Other reasons exist that animals and birds should not be released and these animals and birds may be candidates for euthanasia.

Euthanasia by chemical overdose is for most classes of animal and bird the preferred method but must only be carried out by a Veterinarian or persons authorized by the Veterinary Surgeons Board under the supervision of a Veterinarian.

DEC has a formal agreement in place with an approved group to provide a professional service to euthanase injured large fauna on request. These volunteers abide by a Code of Conduct developed collectively by DEC and volunteers.

ACCEPTABLE EUTHANASIA METHODS

Euthanasia is defined as the induction of death with minimal pain, stress or anxiety. Wildlife rehabilitators who direct the operation of a facility must make these decisions, as well as supervise the euthanasia procedures. They must also exhibit understanding and compassion for those who have been involved with the case.

While no ideal euthanasia agent exists, the procedure of choice should approach as closely as possible the following criteria:

- Produces rapid loss of consciousness and death
- Exhibits consistent and predictable action
- Is easily and safely administered by properly trained personnel
- Causes minimal psychological stress to the animal
- Causes minimal emotional effects to observers and participants
- Is not subject to abuse by humans
- Interrupts consciousness and reflexes simultaneously
- Is not a sanitation or environmental problem
- Is economical and readily available

The method of euthanasia is only as humane as the knowledge and skill of the operator performing it. The safety of the operator shall be given as much consideration as the humaneness of the method.

Below is a brief description of the accepted methods of euthanasia recommended for use in wildlife as documented in the "Euthanasia of Animals Used for Scientific Purposes", 2nd Edition, produced by The Australia & New Zealand Council for the Care of Animals in Research & Teaching Ltd (ANZCCART). Refer to Table 1, identifying acceptable methods for various species. None of these methods should be used without proper training and, in the case of regulated substances, without proper licensing. Each wildlife rehabilitator is urged to seek and learn to use those methods which he/she feels are humane and within their legal and practical limits.

PHYSICAL METHODS:

Cervical dislocation:
Causes death by severing the spinal cord and destroying ascending sensory (pain) pathways, resulting in depression of central nervous system (CNS), respiratory and cardiac functions. Grasping the body of the animal or bird and the base of the skull, the neck is hyper-extended. The neck is rotated in a down and away motion relative to the body position using the thumb and forefingers, separating the first cervical vertebra from the base of the skull and severing the spinal cord.

Advantages: Clean; safe to perform; moderately rapid; special equipment not required.

Disadvantages: Must be performed by skilled personnel. May be aesthetically objectionable to staff/volunteers/public. Should only be performed on small birds and mammals; may remain conscious for a brief period following dislocation (may convulse prior to death).

Decapitation:
Causes death by severing the spinal cord and destroying ascending sensory (pain) pathways, resulting in depression of CNS, respiratory and cardiac functions.

Advantages: Moderately rapid; effective in reptiles, though movement may continue following decapitation. The brain of reptiles must also be pithed or otherwise destroyed to ensure that there is no residual brain activity.

Disadvantages: Must be performed by skilled personnel. May be aesthetically objectionable to staff/volunteers/public. Should only be performed on small animals and birds; animal may remain conscious for a brief period following decapitation (may convulse prior to death).

Gunshot:
Causes immediate unconsciousness by direct and rapid destruction of brain tissue when positioned properly.

Advantages: Rapid; can be used on most species.

Disadvantages: Must be performed by skilled personnel. Requires special equipment and will require firearm permit. May be aesthetically objectionable to staff/volunteers/public. Potential for human injury.

Penetrating captive bolt:
Causes immediate unconsciousness by direct and rapid destruction of brain tissue when positioned properly. Bolt is positioned properly against the skull and fired. This is one of the few options for euthanasing large ruminants and carnivores.

Advantages: Rapid.

Disadvantages: Must be performed by skilled personnel. Requires special equipment and may require permit. May be aesthetically objectionable to staff/volunteers/public. Must be done at close range (nearly direct contact to the animal's skull) and the animal must be properly restrained or sedated to ensure accuracy.

ADJUNCT PHYSICAL METHODS (should not be used as sole method):

Stunning (blunt force trauma):
Striking of the skull, resulting in unconsciousness of the animal.

Advantages: Rapid unconsciousness.

Disadvantages: Not a sole method of euthanasia - usually followed by exsanguination (bleeding – see below); requires skill to be done properly; may be aesthetically unappealing; should not be used if the brain must be examined (as with suspect Lyssa Virus cases).

CHEMICAL METHODS (inhaled agents):

Carbon Dioxide:

Advantages: Rapidly acting gas that can be used with minimal handling of the animal or bird. It is easily available in compressed cylinders; is rapid.

Disadvantages: hazardous to human health, requires specialised equipment and training.
Useful for small animals and birds in chambers. Causes death by irreversibly binding with haemoglobin in the red blood cells.

Table 1: Recommended Techniques for the Humane Euthanasia of Animals and Birds by DEC Personnel Under Field Conditions.

RECOMMENDED TECHNIQUES FOR THE HUMANE EUTHANASIA OF ANIMALS BY CALM PERSONNEL UNDER FIELD CONDITIONS						
	Technique: ☑ Recommended ☒ Not recommended					
	Stunning or anesthesia followed by				**Carbon dioxide inhalation**	**Shooting**
Species	**Blunt trauma**	**Cervical dislocation**	**Decapitation**	**Spinal severance and brain destruction**		
Rabbits	☑	☑	☑		☑ Baby up to 3 weeks	☑
Dingoes/Dogs	☑				☑ Pups	☑
Cats	☑				☑	☑
Bats	☑	☑	☑ Neonates only		☑	
Small mammals	☑	☑	☑ Neonates only		☑	☒
Kangaroos and wallabies	☑	☑ Pouched young	☑ Pouched young		☑ Quokkas only	☑ Brain shot
Birds	☑	☑ Chicks, small and medium sized adults only	☒		☑ Chicks, small and medium sized adults only	☑ Large species 3kg and over only
Lizards and snakes	☑	☒	☒	☑	☒	☒
Tortoises and turtles	☑	☒	☑		☒	☒
Crocodiles	☑ Juveniles	☒	☑ Juveniles	☑ Juveniles	☒	☑ Brain shot only
Amphibians	☑	☒	☑	☑	☒	☒
Fish	☑	☑ Small fish only	☑	☑	☒	
Mice and rats	☑	☑ Animals over 150g must be stunned first	☑ Neonates only		☑	☒
Cetaceans, sirenians and pinnipeds	☒	☒	☒		☒	☑ Brain shot only for small species ☑ Explosives for large species

(From Chapman, T. Sims C & Mawson P (2005) *Minimising Disease Risk in Wildlife Management* Department of Environment and Conservation. Pp: 37.)

NON-ACCEPTABLE METHODS OF EUTHANASIA

(Methods considered inhumane and/or unacceptable for euthanasia of wildlife)

Many techniques have been used to euthanase wild animals and birds, but many of these are also considered inhumane (therefore not true euthanasia) or extremely dangerous, and are not condoned under these Minimum Standards. Methods which are not approved for use in wildlife are:

Methods not acceptable for any reptile*:*

- decapitation alone
- stunning or blow to the head alone
- intracardiac, intramuscular, intracoelomic, intrahepatic and intrapulmonary injection of sodium pentothal without prior anaesthesia
- inhalation anaesthetics such as halothane, isoflurane, methoxyflurane, carbon dioxide alone.

Hypothermia
Cooling (3-4°C) will reduce a reptile's metabolism and reduce locomotion and hence facilitate handling, however it should be remembered that cooling does not reduce the ability to feel pain. It has been stated that cooling (followed by freezing) is not acceptable for euthanasia purpose in animals as there may be an initial period of discomfort due to ice crystal formation, both on the skin and within the body. Euthanasia of reptiles by injectable agents or by physical methods is preferable.

In addition, the following are not considered to be acceptable forms of euthanasia for any animal:

- air embolism (injecting air into a vessel)	- decompression (suffocation)
- burning	- drowning
- carbon monoxide (eg car exhaust)	- exsanguination (allowing and animal to bleed to death)
- chloral hydrate	- household product and solvents
- chloroform	- neuromuscular blocking agents
- cyanide	- strychnine

(From Reilly, J (2001) *Euthanasia of Animals Used For Scientific Purposes* ANZCCART, Adelaide, AVMA Panel on Euthanasia (2000) Pp: 72-73, AVMA Panel on Euthanasia (2000), *2000* Report of the AVMA Panel on Euthanasia" *JAVMA* Vol 218(5): 670-696, Glenn Shea, Larry Vogelnest and Rupert Woods, pers. comm.).

Post Mortems
A post mortem may be performed by the rehabilitator and used as a teaching opportunity. Carcasses that do not undergo a post mortem may be transferred to local natural biology museums, universities or other institutions for study and/or addition to their collections. The wildlife rehabilitator may contact these institutions and arrange for proper handling of the carcasses so that the institutions can gain the most benefit from them (e.g. carcasses may need to be frozen, placed in formalin, etc.). Specific data may also need to be recorded by the rehabilitator, such as date and location animal was found, live body weight, etc. In many cases, the information provided by the rehabilitator can be as valuable as the specimen itself. DEC must be contacted and a plan determined for the post mortem or removal of all Specially Protected Fauna.

If the wildlife rehabilitator desires to keep specific parts or portions of carcasses including eggs, larvae, semen, carcass, skin, plumage or fur for educational purposes they must contact DEC Wildlife Protection for advice. Consideration will be given to issuing a letter of authorisation to keep such items. Special letters are not required for the rehabilitator to possess feathers for imping purposes.

DISPOSAL OF CARCASSES AND ANIMAL WASTE PRODUCTS

Each animal or bird that dies or is euthanased while under the care of a wildlife rehabilitator should always be examined carefully to confirm that the animal really is dead (lack of pulse or heart beat, eye reflex.) If in any doubt, consultation with veterinary staff is recommended. The rehabilitator may be required to transfer the carcasses of Specially Protected Fauna to a specified location. All other carcasses and all animal waste products should be disposed of in accordance with acceptable practices as required by local council or shire By-laws. Carcasses and organic wastes suspected of disease contamination or those that have been euthanased using potentially harmful chemical methods, such as Sodium Pentothal, should be deep buried or incinerated. Burial of carcasses should be at a depth that will discourage scavenger species from unearthing them.

DEC does not condone the feeding of fauna carcasses to captive wildlife under any circumstances. The Wildlife Conservation Act - Section 16, provides information on the taking of protected fauna and notes that it is illegal to feed protected fauna out to another animal or bird.

CHAPTER 3 - HUMAN HEALTH RISKS

Much is known about specific wildlife diseases, but there are many diseases that are unknown. This is why the basic principles of personal and equipment hygiene must be followed at all times to minimise the risk of exposure to disease agents and minimise the risk of spreading disease.

A zoonotic disease is a disease that we can catch from animals and birds. It is important to remember that we can also transfer diseases to animals and birds that we care for. Wildlife rehabilitators should be constantly aware of the potential for disease transmission and utilise appropriate protective wear, e.g. gloves, eye protection, masks, overalls. Appropriate techniques when handling wildlife must also be used.

Some of the main zoonotic diseases to be aware of:

Reptiles – Salmonella, Mycobacterium and Cryptosporidium

Birds – Salmonella, Psittacosis (Chlamydiophila psittaci) and Mycobacterium

Mammals – Salmonella, Ringworm, Sarcoptic mange, Q Fever, Toxoplasmosis. Toxoplasmosis is a concern if there is direct contact with cat faeces. Also, handling raw meat, including post mortems of native mammals is considered a route of transmission and disposable gloves must be worn.

Bat Viruses – Lyssa, Menangle and Hendra Virus

Specific outbreaks of a disease that are transferable to humans should be reported immediately to your doctor (to establish if the Health Department requires notification), the local veterinary practice (to establish if the disease is notifiable to the Department of Agriculture) and DEC. Strict quarantine and hygiene protocols should be observed in the case of such outbreaks.

All rehabilitators are advised to acquire all necessary vaccinations e.g. Tetanus. Rehabilitators handling bats should have pre-exposure rabies vaccination for Lyssa Virus. Rehabilitators who become pregnant are advised to consult with their doctor for additional information on safety during pregnancy. It is recommended that children involved in helping rehabilitators be of school age and older.

If at any time a rehabilitator suffers an illness for which a diagnosis has been difficult or treatment not effective, the following advice should be provided to your medical practitioner:

"This person works with sick, injured and orphaned native animals and birds and may be subject to exposure of zoonotic agents. Zoonotic disease are caused either by apparently new agents or by previously known micro organisms, appearing in places or in species in which the disease was previously unknown. In considering a diagnosis, especially in cases of generalised symptoms or where diagnosis becomes difficult, the possibility of one of these agents being involved should be considered."

HUMAN HEALTH RESPONSIBILITIES

Domestic animals and birds should not be allowed at a rehabilitation facility. If this is unavoidable, domestic animals and birds must not have direct contact with, or direct exposure to, wildlife that is being conditioned for release.

A program for rodent and insect control is recommended for wildlife care facilities; however, if pesticides are used, care should be taken to avoid contaminating both human and animal food (and animal housing areas) with pesticides.

The rescuer or individual presenting an animal to a rehabilitator should be questioned regarding the possibility of any contact with the animal, such as bites or scratches. If injured, the individual should immediately be referred to his/her own doctor for medical attention. If the bite or injury is from a suspect bat, the animal should be presented to a veterinarian. The veterinarian is responsible for reporting the incident to the State Veterinary Officer who then determines the fate of the bat as per the AUSTVETPLAN. Euthanasia and subsequent testing for Australian Bat Lyssa Virus may be considered.

MINIMUM STANDARDS FOR THE CONTROL OF DISEASES TRANSMISSIBLE FROM ANIMALS AND BIRDS TO HUMANS

- Maintain a high level of personal hygiene such as washing hands before and after handling animals and birds and before eating. Lavatory facilities should be accessible with hand-washing sinks and suitable washing agents.
- Clothing should be clean and changed as often as necessary. It is suggested that the facility provide protective clothing to volunteers and where possible, launder them on-site.
- Shoes and boots should be kept clean of faecal matter, dirt and cage litter.
- Disposable gloves and surgical masks must be available for use if requested and for cleaning contaminated animal quarters.
- Eating, drinking and smoking should be restricted to designated areas away from animals and birds, animal food preparation areas and animal waste materials.
- All supervisory staff must be given basic information on zoonoses. Personal hygiene rules should be established and the supervisory staff should set an example.
- Animal food must be packaged separately from human food, if being stored in the same refrigerator. The storage of animal carcasses (if being kept for samples) in the same refrigeration/freezer as food for human consumption is not ideal and should be avoided if at all possible. If unavoidable, the carcass must be double bagged in heavy duty plastic.
- Keep up to date with information about any specific diseases that may be encountered when working with wildlife.

MINIMUM STANDARDS FOR THE CONTROL OF DISEASES TRANSMISSIBLE FROM ANIMAL TO ANIMAL

- Cages should be cleaned of food and faeces daily and disinfected at the end of use. A spelling period (keeping the enclosure empty) with access to sunlight is highly recommended.
- Hands must be washed in-between handling animals and birds that are not housed together.
- Cages should be designed for efficient cleaning. When possible, seamless, nonporous materials (such as stainless steel, fibreglass or plastics) should be used for cage construction and food containers.
- Dedicated cleaning tools must be used for each aviary or holding cage/box if a contagious disease is confirmed or suspected.
- Animal enclosures should be kept clean by having an adequate and routine cleaning regime in which responsibilities are clearly defined and assigned to volunteers.
- Animals and birds confirmed or considered to have contagious diseases must be kept isolated from all non-infected susceptible animals and birds. Isolation may be as simple as a separate hotbox or a cage set away from all others. As a minimum, a barrier e.g. towel must be positioned between cages/enclosures. Dedicated tools must be set aside for this environment and quarantine measures put into place.
- Newly acquired animals and birds should be housed separately from in-house animals and birds upon arrival and for a period of time which allows the rehabilitator to establish any disease risk.
- Animals and birds that are presented together (litter mates or nest mates) may be housed together during this period. They should not be added to a group pen until it has been established that they are in good health.

CHAPTER 4 - DISEASE CONTROL

Proper disease control is a serious concern for rehabilitators and permit-granting agencies. As a basic principle, personal and equipment hygiene must be followed at all times to minimise the risk of exposure to disease agents and minimise the risk of spreading disease. Upon arrival all animals and birds should be isolated in a separate area (quarantine) until their health status can be determined. This can be as simple as an isolated hotbox or cage positioned away from other animals. Sick animals and birds should be maintained in quarantine throughout the period of their rehabilitation. It is recommended that animals and birds of different species are kept separate.

Facility cleanliness is an integral part of disease prevention and containment. Proper cleaning agents combined with a sensible cleaning schedule will reduce the spread of disease within a facility. Cleaning protocols may vary considerably based on the species and condition of animals and birds in care, facility type, and cage construction. Choice of cleaning agents must be made with these variables in mind. The timing of cleaning efforts is another important feature of effective disease prevention. Suggestions for proper and regular cleaning maintenance will help rehabilitators prevent disease within their facility.

It would be beyond the scope of these standards to note all available options for detergents and disinfectants on the market. What is most important to consider is implementing an effective minimum standard cleaning regime with special consideration given to any changes if a particular disease outbreak occurs and the management of the situation at this time, as some disinfectants work better against specific disease entities. Consult with a local veterinary practice for current information on new products available and their effectiveness for your situation.

STANDARDS TO PREVENT DISEASE TRANSMISSION WITHIN THE FACILITY

Minimum Standards required:

Regular cleaning and disinfecting with hospital-grade disinfectant and drying and sunlight (UV radiation) should be applied to all furniture, equipment and enclosures. The act of physically cleaning with hot water and detergent is the most effective method of removing most (but not all) of the biological containments and agents that can transmit disease. The use of a disinfectant is an essential follow-on step to cleaning and this process will kill most (but not all) of the remaining biological agents of a disease.

Detergents are cleaning compounds and include both soaps and synthetic detergents. While soaps are non-antibacterial, the physical scrubbing action of cleaning removes many of the microorganisms. Detergents alone do have minor disinfectant action against vegetative bacteria, however, they are not effective against fungi or viruses. Additionally, they lose their disinfecting effectiveness in the presence of blood or tissue debris.

Examples: Dish detergents and laundry detergents.

Disinfectants destroy microbial organisms or decrease the rate of their activity. Selection of a disinfectant for use in the facility should be based on its spectrum of activity. A disinfectant that will be effective against bacteria, fungi and viruses, with low toxicity and good biodegradability, is ideal. Ensure that all residue is rinsed from all equipment after the disinfectant has had the appropriate contact time.

Example: Chlorine (bleach) is effective for general everyday use and is inexpensive. The disadvantages include: the spectrum of activity is not as broad; its lack of efficacy when organic matter is present e.g. if you have not cleaned adequately in the first instance, your disinfecting process will be much less effective; and bleach is highly corrosive and breaks down in light.

Example: Essential Chemicals F10 ®XD or SC, Virkon® or Viraclean®. These broad-spectrum activity disinfectants are effective for most situations. The disadvantages include lack of efficacy when organic matter is present; these products are more expensive than chlorine.

Drying and Sunlight Drying and exposure to sunlight (UV radiation) e.g. hanging hessian bags in the sun will kill most (but not all) bacteria. Bacteria flourish in warm moist environments.

Thorough drying of enclosures and equipment is an important requirement to ensure proper and effective disinfecting.

CHAPTER 5 - RELEASE CONSIDERATIONS

Successful release of a rehabilitated animal is predicated on an understanding of biological and non-biological factors. These include medical and physical readiness and life-stage of the animal, release strategy and the habitat available.

Establishing and following minimum standards for release conditioning will aid in the initial decisions for treatment, husbandry care protocols and evaluation of readiness for release. For all wild animals and birds undergoing rehabilitation, the following criteria must be met prior to release.

Serious consideration should be given to the likelihood of being able to meet the following minimum release standards, before instigating a course of long-term treatment and rehabilitation. Euthanasia should always be considered as the preferred option if it is unlikely that the animal cannot be fully rehabilitated, or if the rehabilitation will involve significant levels of stress and/or pain for the animal in long-term and intensive treatment/rehabilitation programs. Before an animal is considered for placement in long-term captivity (for education or captive breeding), its suitability and adaptability to captivity should be assessed. In many cases, an adult wild animal is likely to suffer significant physical and psychological stress in captivity and would be an inappropriate candidate for this purpose.

STANDARDS FOR RELEASE

Minimum standards for release candidates:

- Demonstrate recovery from the original injury or from injuries incurred while in care.
- Be no longer in need of medical care.
- Exhibit no signs of active disease.
- Must demonstrate an appropriate level of physical fitness.
- Must possess adequate vision to find/catch food, avoid predators and have full physical function.
- Exhibit locomotive skills necessary for that species to survive. Navigate in a complex environment.
- Demonstrate an appropriate fight or flight behavioural response.
- Demonstrate proper foraging behaviour (ability to recognise, source and harvest food).
- Demonstrate normal species behaviour (e.g. not improperly imprinted, appropriate nest construction, ability to define territory).
- Be of correct age for independent survival. In the case of foster care, must be positioned within appropriate social group.
- Be of correct weight for that sex, species, age and season.
- Possess pelage, scales, skin or plumage that is adequate for that species to survive.
- Exhibit waterproof pelage/plumage sufficient for that species.

WHERE TO RELEASE

Rehabilitated animals and birds must, where possible, be released where the animal originated from, within the animal's normal home range and where such fauna is ordinarily found in the wild. This practice minimises the unnatural spread of parasites, diseases, and genetic material among wild populations and maximises the animal's chance of survival.

If information regarding the location where the animal originates from is not available, or the site is no longer suitable due to habitat loss or other reasons, an alternative suitable site must be selected. Selection must comply with Regulation 28A of the Wildlife Conservation Regulations, 1970, as set by DEC and should meet all habitat requirements of the animal. The rehabilitator may contact DEC for current information on suitable release sites.

In some circumstances juvenile animals and birds, especially those that were brought into rehabilitation as infants, may not be able to be released at the site of their capture. Release sites should be selected based on the same criteria as noted above.

DEC must be notified of any pending release of a Specially Protected Fauna.

WHEN TO RELEASE

Consideration must be given to the species, its natural biology and the most appropriate time to release.

As a minimum standard the following must be considered:

- Is it breeding season? Is this the correct time or incorrect time for this species?
- Is it nocturnal? Release early evening, to allow maximum number of night time hours to become familiar with the local surrounds and locate appropriate daytime refuge sites.
- Is it diurnal? – Release at dawn to provide maximum number of daytime hours to become familiar with the local surrounds and locate appropriate night time refuge sites.
- Is it migratory? If so, where should it be released?
- Is the current and forecasted weather going to have an impact on its survival?

SOFT AND HARD RELEASE CONSIDERATIONS

Consideration must be given to the selection of release technique employed for a group and/or individual.

Minimum standards:

In general, young altricial animals and birds benefit from "soft" release, while adults and young precocial animals and birds are often best served with a "hard" release.

Mammals

- Hand-reared marsupials are better suited to a soft release program.
- Hand-reared marsupials being released into DEC monitoring transects, (that is, an established predator-proof environment with ongoing scientific monitoring), may have a hard release if determined appropriate by DEC staff.
- Adult mammals that have been in captivity for a short period of time due to injury or illness and are being returned to the original encounter site are suited to a hard release.
- Adult mammals that have been in care for an extended period must be assessed to determine that the animal has all the necessary skills to cope with a hard release i.e. has the ability to re-establish territory.
- Hand-reared bats that have been socialised and conditioned to find their own food and can fly with complete accuracy can be hard released at a site where other bats are known to roost.

Birds

- Hand-reared birds that have been conditioned effectively during fledging and weaning can be soft released in a group. Assessment of the birds close to release time must be made to determine suitability for type of release.
- Adult birds that have been in captivity for a short period of time due to injury or illness and are being returned to the original encounter site can be hard released as quickly as possible.
- All birds must be able to waterproof themselves before being released.
- Species that recognise each other as the same may benefit from being released in a group to aid in picking up behavioural cues from others in the group.

Reptiles

- Rarely require a soft release and can be moved through Stage 2 (refer to Chapter 6) quite quickly and then released at the original encounter site where appropriate.
- The exception to this may be those that are born in captivity by default and then released.
- Experience demonstrates that Shingleback lizards that are born in captivity must be over 150gms in bodyweight before being released. Where possible, they must be released in the mother's home range.
- If a winter release is necessary, reptiles need to be fasted and only released when the gut is empty of food (several days of no stool after an appropriate amount of stool is passed following the last feed).

Amphibians

- Rarely require a soft release and can be moved from Stage 1, through Stage 2 (refer to Chapter 6) quite quickly and then released at the original encounter site where appropriate.

In all cases of release the rehabilitator must comply with the conditions listed as minimum standard for attempting a release.

SELECTION OF RELEASE SITE

The following factors are to be considered when selecting a release site:

- Suitability of habitat for the species;
- Adequacy of food supply and long-term food sources;
- Proximity of busy roadways;)
- Absence of natural or introduced predators (e.g. domestic cats), human developments;
- Absence of dangerous/toxic species of plants;
- Absence of current or pending damage licence practices in the area;
- Presence of existing populations of that species, free from known disease. Consideration must be given to the density of conspecifics at the proposed release site and whether there is likely to be vacant territory available for the released animal to occupy without excess aggressive interactions with resident animals and birds; and
- Domestic animals and birds must not be present at the immediate release site.

Releases must occur within the parameters of local and state regulations and within the natural range of the species.

TRANSPORTATION OF ANIMALS AND BIRDS

Animals and birds must be transported in an appropriate secure carrier. The process of transporting must be as stress-free as possible.

Minimum standards:

- Carrier size and construction must be appropriate to avoid any injury and undue stress to the animal in transport;
- Appropriate carrier size to allow the animal to stand but not necessarily turn around;
- Minimise noise around the animal;
- Minimise light and visual stimuli around the animal;
- Appropriate ventilation and climate control must be effective during transportation;
- Appropriate food and water must be available if the journey is extended;
- Appropriate crate size according to International Animal Transport Authority (IATA) Regulations must be maintained in the event that the animal is being flown to a release site;
- The animal must not travel in the boot of a car; and
- Domestic pets must not be transported with wildlife.

CHAPTER 6 - HOUSING REQUIREMENTS BASED ON STAGES OF CARE

Appropriate cage space is conditional to the species, the behaviour of the individual, the nature of the injury and the specifics of treatment and recovery. Recommended cage dimensions are based on approximations of space requirements during three recovery periods, each defined by the activity level required of the animal(s). These are:

Stage 1 – Intensive Care (sick/injured/hand-rearing)
Stage 2 – Acclimatisation
Stage 3 – Pre-release

The following paragraphs describe the three stages and the housing best suited to the stage. Indoor caging is replaced by outdoor caging as the animal progresses through the rehabilitation process. Animals and birds requiring large expanses of water (for example, grebes, pelicans, pelagic birds, and many marine animals) present some challenges to wildlife rehabilitators and this staged approach may not apply directly to such species.

During the process of recovering from an injury or illness and the rehabilitation period, an animal or bird should not be moved from rehabilitator to rehabilitator unless this is essential and in the best interest of the animal or bird. This type of disruption may lead to stress-related illness and possible separation anxiety. This is particularly important when dealing with hand-reared mammals.

STAGE 1 - INTENSIVE CARE

Intensive Care (IC) has two main purposes: to restrict activity and to maximise environmental support by provision of medication, heat, humidity and supplementary nutrition. IC is maintained primarily indoors. An animal that is sick/injured or is in the very early stages of recovery will have its movements restricted but will be provided with enough room to maintain a normal alert/upright posture and to stretch its body, limbs and tail, but not enough to leap, fly or run. Conditions requiring restricted activity include re-hydration, hypothermia, fractured bones and wound care. Any animal with severely debilitating conditions such as shock, toxicity, neurological impairment or other conditions that require close supervision and management should be considered for IC. The holding area should be small enough to facilitate easy observation and capture, thereby minimizing capture stress and the possibility of injury during repeated periods of capture and treatment. Animals and birds confined to their pouch/nest prior to weaning and fledging are included in this category.

Restricted activity areas are provided by housing in hotboxes, pet packs, veterinary cages and other small enclosures. Refer to the Department of Environment and Conservation 'Basic Wildlife Rehabilitators' Course Manual for more comprehensive information on options for IC housing. Perches close to the cage floor (relative to the size of the bird) and/or walk-ups to perches should be provided to avoid further injury or damage to tail feathers. Padded perches should be provided to minimise bumblefoot in raptors and waterbirds. Hiding areas such as boxes/pouches or towels must be provided for those species with more reclusive behaviour such as snakes and marsupials.

STAGE 2 - ACCLIMATISATION

Acclimatisation and physical therapy comprise the next phase of the rehabilitation process with the animal recovering from illness or injury; in the case of orphaned animals and birds, Stage 2 is the process of weaning/fledging. Stage 2 can be maintained with a combination of housing indoors and outdoors. Movement is now encouraged to build up strength and to provide gentle physiotherapy where needed. This physical therapy may be voluntary or enforced by the rehabilitator. Periodic capture and medical treatment may still be necessary and the animal must be in an appropriately sized holding to facilitate this. These enclosures are also used for fledged birds and mammals in the process of weaning. Macropod "joey yards" may fall into this category, with a set-up being as simple as a veranda or small section of garden with *ad lib*

access to hanging pouches and/or a secure enclosure. Outdoor caging should provide the opportunity for short flights or walks/runs. Perches and walk-ups to perches (birds) or hiding areas and nest boxes (all animals and birds) are appropriate furnishings. Semi-aquatic and pelagic species should be supervised in tubs or pools of water provided for exercise.

STAGE 3 - PRE-RELEASE

Unlimited activity using large outdoor aviaries/enclosures is essential in this stage. This environment provides physical and psychological experiences and conditioning or reconditioning through extended flights for birds and walks, runs and/or climbs for reptiles/mammals. This housing should allow animals and birds to improve their strength, develop stamina and coordination, restore muscle tone, and continue to acclimatise to current weather conditions and other elemental stimuli e.g. wind, noise and the general environment. Physical therapy should be primarily voluntary, although some may be provided by care-givers. Pre-release aviaries/enclosures should be used to prepare fledged birds and weaned mammals for release. There are often one or two additional stages factored into Stage 3 for hand-reared macropods.

Reptile and amphibian species are often an exception to requiring a staged rehabilitation process. Most lizards, snakes, tortoises and amphibians can move from Stage 2 directly to release. The larger varanid species may require a Stage 3 pre-release period in their rehabilitation to ensure fitness on release.

NUTRITIONAL ACCLIMATISATION

As an animal or bird progresses through Stage 1 and moves into Stage 2, its nutritional needs must be considered and a plan put into place. An early move to a natural diet is essential in many species due to the possibility of unknown nutritional deficiencies in captive diets and the unavailability of commercial products in the wild. All animals and birds should be fed a nutritionally balanced, palatable diet in a form and presentation that they will recognise and be exposed to once released. Nutritional balance is essential for all animals and birds and is particularly critical in the case of fast growing young animals and birds. DEC does not condone the feeding of live prey, other than insects and fish, during rehabilitation.

Minimum standards:

Nutritional needs in the case of preparing for soft releases

- Consideration is given to providing a standard bowl of food close to a release hatch or the aviary door in preparation for when the hatch/door is open and the animal or bird can return for the food.
- Consideration is given to changing the presentation of the food to allow it to be scattered in the aviary/enclosure in place of presenting a bowl of food.
- If the animal is still returning and eating all food provided by 8 weeks post–release, a review of the release must be completed and a plan implemented.
- Wean the animal off the supplemented food slowly and systematically.

Nutritional needs in the case of preparing for hard release

- Does the animal recognise natural food; does it eat the food?
- Is it on a wild diet prior to release?
- Can it forage and catch its own food locally?
- Is it maintaining weight on a wild diet?

Food intake must be monitored regularly during Stage 2 and Stage 3. As a minimum requirement during Stage 2, body weight must be taken every 2 weeks. When the opportunity presents, body weights can be taken more frequently. Body condition scoring may be a substitute in cases of larger animals and birds. During Stage 3 weighing the animal is not recommended due to the need to handle the animal. However if there are concerns about the animal or bird's food intake and body condition, a weight must be obtained and body condition assessed. A plan to improve the status can be set from here. A release weight (where achievable and appropriate) or a comment on body condition is a requirement for your records.

ENVIRONMENTAL ACCLIMATISATION

To minimise unnecessary stress, animals and birds must be taken through a process of environmental acclimatisation at each stage of their rehabilitation.

Stage 1 to Stage 2

- Reduce the amount of supplementary heat being provided. This can be reduced over one or two days by turning the thermostat/dimmer or reduce the wattage of the heat source. Reach the point where the animal is still in its IC environment but is not receiving supplementary heat.
- Reptiles may require a thermal gradient.

Stage 2

- Moved to an ambient temperature environment. Can be inside for evening and outside for periods during daytime.
- Progress to spending all time outside but still in the smaller holding cage, protected from inclement weather.
- May provide supplementary heat at night only, and on days when there is cooler weather.
- Provided with more space
- Provided with basic structure in the environment to meet needs e.g. perches, climbing structure.
- Reptiles in many cases may move from Stage 2 to immediate release. Large varanids may be an exception to this, where developing a level of fitness is essential prior to release. These monitors will benefit from going into a pre-release environment.

Stage 3

- No supplementary heating.
- Outside all the time with access to inclement weather and protection.
- Larger environment for fitness to develop.
- Almost non-existent human interaction.

CHAPTER 7 - BASIC REQUIREMENTS FOR HOUSING DURING REHABILITATION

The natural biology and behaviour of any species must be considered in the enclosure design process. Not only does the enclosure provide for security from escapes and protection from outside interferences and predators, it provides habitat in which the animal can learn or relearn behaviours specific to that species. Caging should provide animals and birds undergoing rehabilitation the opportunities necessary for complete recovery from injuries and/or for learning and practising vital behaviours such as foraging or hunting. Cage design and furniture should address and encourage species-specific patterns of foraging, play, rest or sleep, hiding or predator avoidance, and social responses to conspecifics or cage mates, including reproductive behaviour. Minimum standards for appropriate habitat furnishing can be found in the specific housing sections that follow.

Wildlife rehabilitators should be able to provide enclosures or cages of appropriate size made from appropriate materials that contain appropriate furnishings for all ages of all species that they commonly care for. The cage/enclosure/aviary sizes recommended in the standards are minimal, and the suggested materials work well for many rehabilitators. Alternative techniques for housing and pre-release conditioning are encouraged, but must meet basic natural biology, comfort, husbandry and hygiene requirements. Assigning cage size strictly by species is not always realistic; variations in an individual's size and variations in an individual's behaviour due to age and season, will affect appropriate cage size. Dimensions can be modified to accommodate special needs of the facility or the individual animal and new advancements in the field.

Minimum standards for enclosures are based on good judgement and sound practical sense. All enclosures must be structurally sound, constructed of materials appropriate for species housed, maintained in good repair, and designed to protect the animal from injury, abuse, or harassment, while containing the animal and restricting the entrance of other animals and birds. Enclosures must provide sufficient shelter from overheating, excessive rain and cold temperatures. Each animal must be able to turn about freely, and lie or sit comfortably, unless medically restrained. The construction material must be of sufficient strength and be of a nonporous, waterproof finish (when reasonable) to facilitate effective cleaning and disinfection.

The facility or home set-up should have reliable and adequate water and electricity. Food and bedding must be stored in an appropriate manner that protects it from spoilage, infestation and contamination. Waste must be properly disposed of in accordance with all regulations, in a manner that minimises vermin infestation, odours, and disease hazards. The facility must provide fresh air in a manner that avoids drafts, odours, water condensation, and provides auxiliary ventilation. Lighting must be adequate to allow for inspection and cleaning, while not stressing animals and birds. The facility must be sufficiently drained to protect against sewage back-up and to rapidly eliminate water accumulation.

Many indoor and outdoor cages can be constructed for multi-species use. These cages can be quickly modified to accommodate different species through substituting different perches or other furnishings. A separate cage is not needed for each species the rehabilitator intends to treat, but cages should be able to be adequately cleaned and disinfected and adapted to meet the minimum standards required for the species.

Many young animals and birds, e.g. fledgling magpies or juvenile kangaroos, must be group-housed with conspecifics to avoid imprinting on and/or socialisation to humans. Efforts must be made to network with other rehabilitators to place individual (single) young animals and birds with others of its own species and to place a large species that requires extensive rehabilitation space in an environment conducive to its recovery.

GENERAL INDOOR HOUSING

Indoor holding is generally in effect when an animal is in Stage 1 of the rehabilitation process and is sick/injured or is being hand-reared. This is a critical time for the animal and stress must be reduced as much as possible.

Minimum standards include:

- Location in an area that provides quiet and minimal visual stimuli.
- Provision of visual barriers, positioning cage fronts away from human activity, and placing the enclosures far from noise and high traffic areas.
- When possible and species-specific, provision of natural daylight. Full-spectrum, UVB, UVA and visible lighting should be used when natural lighting is not feasible. Any artificial light source should be timed to mimic current seasonal daylight cycles.

GENERAL OUTDOOR HOUSING

Animals and birds undergoing rehabilitation must be housed in secure outdoor enclosures prior to release to allow for adjustments to climate and external natural stimuli. Large, outdoor enclosures provide opportunities for exercise, behavioural rehabilitation, and climate adjustments, while smaller outdoor caging may be used for Stage 2 acclimatising.

The selection of minimum cage sizes is determined by the animal or bird's ability to make a full recovery. None of the Stage 1 or Stage 2 sizes are recommended for extended or permanent care (with the exception of reptiles). Housing for animals and birds kept permanently (e.g. for educational, exhibit or captive-breeding purposes) is not addressed in this document. Refer to Wildlife Conservation Regulations, 1970, Section 31, Code of Practice for Exhibited Animals and Birds in Western Australia and General Standards for Exhibiting Animals and Birds in NSW. The information available on appropriate size aviary/enclosure for all captive wildlife species is limited and it is the opinion of DEC that the rehabilitator adopt (where feasible) the Stage 3 pre-release sizes (as noted in this document) for housing fauna used for education and breeding purposes.

Special consideration must be made in the design of outdoor enclosures to provide adequate and proper shelter, safety, and habitat for all animals and birds in rehabilitation. Enclosures should be made secure against rodents and potential predators, including adequate perimeter control. For example, a cement floor and foundation with suitable mesh and cover. Refer to each section "Housing Requirements" for detailed information. Enclosures and their contents should duplicate natural conditions wherever practical. Design should provide for ease of cleaning, proper ventilation, adequate light, and temperature control. Proper substrates and furnishings appropriate for each species should also be provided in each enclosure. Fresh water for drinking and/or bathing must be available in each enclosure.

Each outdoor enclosure must possess an area that provides necessary protection from the elements, yet still enables the animal to be conditioned for survival in the wild. All cages should have a roofed portion and contain means of protection from inclement weather and for security. Feeding areas (and the food within) must be protected.

Outdoor enclosures ideally protect the animal without habituating it to human activity. To avoid habituation to humans and/or imprinting, enclosures should be surrounded by a fence or placed out of view. As in the design of indoor housing, minimal human contact, both visual and auditory, is essential. Domestic animals and birds and other potential predators must be prevented from contacting animals and birds in rehabilitation, as predator avoidance is an important factor in survival of rehabilitated animals and birds. Consideration of these variables when designing outdoor enclosures is vital for proper rehabilitation of wildlife.

Outdoor housing alone may not be adequate for full conditioning of certain species or certain injuries. For example, the fitness-conditioning requirement for successful release of a pelican recovering from a leg fracture

may exceed that provided by most rehabilitators. The large cages or deep pools necessary for proper conditioning of some species are not available to all wildlife rehabilitators. In many instances, cooperation with other rehabilitators or wildlife professionals may ultimately be the most successful strategy an individual rehabilitator has available to them.

Transferring animals and birds to other rehabilitators with more appropriate caging must be considered. The successful release and continued survival of rehabilitated animals and birds is the goal of rehabilitators; networking to share information, skills and equipment is vital to the success of rehabilitation.

CHAPTER 8 - AVIAN HOUSING REQUIREMENTS

Cage sizes specify the minimum and are calculated for the species at different stages of rehabilitation. Intelligent substitution of height and ground area requirements is encouraged; for example, while pheasants and egrets are the same size, one requires ground space while the other needs height. Substitutions resulting in larger sized or differently shaped cages are encouraged.

Multiple occupancy by several members of the same species is not only acceptable, but is often beneficial, particularly in acclimatisation caging for fledgling birds. You may need to house more than one species together and in these circumstances it is optional to house similar sized birds of similar lifestyles, i.e. diurnal with diurnal, social with social, to avoid aggression. Individuals of certain species (e.g. herons, egrets) may be extremely aggressive and may require separate housing.

HOW MANY BIRDS IN AN AVIARY?

It is very difficult to provide Minimum Standards for the maximum numbers of birds that can be safely housed in an aviary. Observation of the birds in the wild will often give the best indication of what to be aware of when trying to gauge the concentration of birds in a confined space. If you are housing a species that forms groups, a clear guide is the average number of birds in a group in the wild. If the birds are not a flocking species, set a limit on the number going into an aviary. *Caring for Australian Native Birds, Chapter 53 - Housing, Page 60, Heather Parsons, 1999, Kangaroo Press.* Observation for signs of overcrowding is essential.

GENERAL AVIAN FURNISHINGS

Many types of cage furnishings are appropriate for birds undergoing rehabilitation.

Minimum standards:

- Perches must be customised to the appropriate size and material for the species using them. Perch diameter, appropriate size and substrate of the perch will vary with the natural biology of the species (e.g., limb-perchers vs. ledge-perchers) and should be designed with the goal of minimising foot damage.
- Perching sizes are relevant to the ability of the longest toes to curl one-third the way around the perch.
- Bowls or pools for bathing should be provided for all birds whose medical condition does not prohibit them from getting wet.
- When perching is required, each cage should have a minimum of two perches (excluding Stage 1 housing) for birds capable of perching.
- Perches must not be positioned directly over each other or over food or water containers.
- Outdoor caging must contain some sort of nest box for cavity nesters or a sheltered area for other birds. Nest boxes and shelters provide a natural space that reduces stress and enhances security.
- Access to normal, natural weather variants such as sun, rain and wind etc.

Construction Materials

Many different types of construction materials are used for avian enclosures for rehabilitation. Selection of appropriate material is important for the proper construction of adequate enclosures.

Minimum standards:

- Aviaries must have a double-door entry system for housing birds that can fly in confined areas. Aviaries may have a single-door entry system for housing birds that do not fly, or may not be able to gather flight capability in confined areas.
- Aviaries must be lockable.
- Rodent and predator proofing must be in effect.
- Building materials for the structure must be sturdy.
- Solid walls for aviaries are to be constructed of Zincalume, weathered galvanised materials or other materials of a suitable nature.
- A minimum of one third of the aviary must be protected from the elements. This can be achieved with construction of solid material to provide cover and security. Screening with natural foliage e.g. trees or shrubs planted around the outside of the aviary may also provide cover and security.
- All surfaces must be of non-toxic materials including paint, treated woods and metals.

Flooring Considerations

Flooring or substrate for aviaries varies with types of birds.

Minimum standards:

- For perching birds concrete base is adequate.
- For ground birds substrates such as mulch, leaf litter or sand are appropriate but should be changed as often as necessary, and twice a year at a minimum.
- Some organic flooring e.g. sawdust, straw, wood shavings and other such flooring materials can carry fungal pathogens such as aspergillus and should be used with caution. Raptors and waterbirds are particularly susceptible to these pathogens.
- Natural flooring is ideal in very large enclosures. This natural flooring must be turned over on a regular basis to allow aeration, depending on the number and size of birds housed in the enclosure.
- Suitable substrates for small holding cages include newspaper, cloth material, paper towels, raised netting over newspaper and rubber mats. The selection of substrate is dependent on the species being housed.

HOUSING FOR SONGBIRDS

The songbird (passerine or perching) group of birds includes a large number of individual species with wide ranges in size, behaviour, habitat, foraging techniques, food items, and subsequent rehabilitation requirements. These requirements must be understood and addressed to ensure successful rehabilitation and eventual release of healthy, well-adapted individuals that are prepared for survival in the wild.

Understanding the natural biology of any species in rehabilitation is necessary when considering caging arrangements. Songbirds have many natural predators such as other birds, snakes and small mammals, as well as domestic animals and birds that are associated with people (e.g. cats and dogs). Care should be taken to reduce exposure of these birds to potential predators, thereby reducing stress and/or potential injury.

The requirements for pre-release conditioning caging vary greatly among songbird species. The rehabilitator must understand the natural biology of the species and consider the bird's needs during rehabilitation and pre-release conditioning. As an example, some species generally fly straight from their nests, requiring very little pre-fledge training, whilst others leave the nest early and spend a lot of time on the ground while developing flight feathers. During this time, the fledglings follow the adults and learn appropriate survival behaviours. Larger songbirds require space to exercise and practice flying, so a larger aviary is recommended to house these species.

Construction Materials

External wire on outdoor caging for songbirds should be made of galvanized mesh. The use of chicken wire or chain-link is not recommended, as the large openings allow predator entry or accidental escape of inhabitants if the interior lining becomes torn or loosened. Wire screening has been used successfully without causing damage to feathers.

Furnishings

Understanding the natural biology of the species being rehabilitated, and then adapting the aviary accordingly for that species will give birds a great advantage when released. Cavity dwellers/nesters should be provided with some sort of hide box or cavity-type container. Aviaries that are furnished with natural plantings help reduce stress and provide the birds with natural shading, perching, hiding, and foraging opportunities.

Table 2: Minimum Standards for Housing Various Avian Species

Note: This table is not intended to be used independently; it should be used only in conjunction with the information in Chapter 8: Avian Housing Requirements.

Species	**Length of bird**	**Stage 1 WxLxH**	**Stage 2 WxLxH**	**Stage 3 WxLxH** *General considerations* ***W = 3 x wing span*** ***L = 10 x wing beats***	**Mesh size & weight**
Pigeons/Doves Nightjars	25 to 35cm	32x20x32cm	57x45x45cm	2x2x2m	25x12.5mm
Honeyeaters Wagtails Wrens/Finches Wattlebirds Tree martins Swallows	>22cm	32x20x32cm	57x45x45cm	2x3x2m	6.5mm² 19 - 23g
Butcherbirds Mudlarks	<40cm	32x20x32cm	85x85x60cm	2x3x2m	25x12.5mm
Magpies Raven Currawong	>50cm	50x53x64cm	85x85x60cm	2x5x2m	25x12.5mm
Neophema Lorikeets	>22cm	32x32x32cm	85x85x60cm	2x3x2m	12.5mm² 20g
Kingfishers Bee eaters	>28cm	32x32x32cm	85x85x60cm	2x5x2m	6.5mm² 23g
Kookaburra Tawny Frogmouths	>50cm	55x53x64cm	85x85x60cm	2x6x2m	25x12.5mm
Larger Parrots	>40cm	55x53x64cm	85x85x60cm	2x5x2m	1.6x1.25mm or 25x12.5mm 16 --18g
Cockatoos	>60cm	60x59x70cm	2x2x1m	5x6x2m	4x2.5mm 8- 12 g
Mallee Fowl Coucal Brush turkey	>60cm	42x67x48cm	2x2x1m (soft roof, or false ceiling)	5x15x4m (ensure roof material is soft bird netting and ensure plenty of natural cover and trees for high roosts)	25x25mm (line large enclosures with shade cloth for protection and visual barriers)

HOUSING FOR WATERBIRDS

Waterbirds, as the name implies, are those birds that spend much of their time in, on or around the water. At Stage 3 (pre-release), waterbirds all require a water pool in their outdoor caging. The size of the pool varies from species to species. The natural feeding, drinking and bathing behaviour of each species should be considered in the design of the pool, including depth of the water to accommodate such behaviours.

Water quality must be considered when housing waterbirds. Birds more easily align their feathers in fresh soft water. Water softness of 2-3 grains or 30-50mg per litre calcium carbonate is optimal. Higher concentrations of minerals in hard water appears to interfere with waterproofing. Hall (sighted Clumpner, 1990) found that after birds have been in the above water for 24 hours and are waterproof, they may be moved to harder water or to salt water.

As a pelagic bird moves into the stages of pre-release, providing salt water in the pool can be considered. This is an expensive exercise, both in time and money. Alternatively, the bird's salt requirements can be met by providing salt tablets in its diet. It is essential for true pelagic birds to be 100% salt tolerant prior to release; however, most other aquatic species will tolerate the change from fresh water to salt water with less intensive acclimatisation.

The cage sizes recommended in this manual are minimums and may not accommodate for flight, but do allow for a bird to flap its wings fully extended without coming into contact with enclosure sides. Every bird would benefit from as large an area as possible and the rehabilitator is encouraged to construct larger cages whenever reasonable. Large cages intended for animals and birds with greater space requirements can be designed to be subdivided or furnished for other species when needed.

Construction Materials

Construction materials for aquatic bird aviaries will differ to those for most other avian species.

Minimum standards are:

- All materials should be easy to clean and disinfect.
- Only use materials that are impervious to water or that can be sealed to become impervious.
- Materials utilised for walls should provide visual barriers, minimise chances of injury, provide adequate ventilation and protect against predators and domestic animals and birds.
- Pool materials include plastics, fibreglass, rubber, cement and natural ponds.
- Pool design must allow for a graduated side and/or roughened surface to minimise damage to the bird's keel when exiting the pool.
- Any sharp or abrasive areas must be covered to prevent injury and substrates should be appropriate to prevent husbandry-related injuries to feet.

Most waterbirds spend the majority of their time in or near large bodies of water and are conditioned to seeing open sky overhead, the majority of the roof on an outdoor cage should be open, allowing for a clear view of the sky. Netting works well for this application and will prevent injury from collisions if the bird flies upwards. This type of construction is psychologically beneficial to the bird and it encourages them to exercise.

Many of these birds are colonial foragers and nesters. Group housing for species that are colonial waterbirds may reduce stress whilst in captivity. A precise knowledge of the species' natural biology will help in determining if the birds in rehabilitation are too territorial for group housing or what the optimum number of individuals might be for any given enclosure dimensions.

Furnishings

Some factors in successful habitat construction are species-specific:

Diving species require deep pools and often will not enter a shallow pool such as a children's paddling pool. Rocks or short pilings for perches are required for some divers, but should never be used for small ducks and grebes, as these types of perches are too high and would cause keel damage if used.

If waterproof, ducks, grebes and swans will remain in the water rather than perch; if not waterproof, netted floats or padded haul-out areas should be provided for these species.

Herons & egrets require tall cages to prevent head trauma, as they tend to jump rapidly upwards.

Wading birds bathe regularly, requiring pools up to 25cm in depth. Because they are wading birds, the depth should be graduated.

Terns and oystercatchers will fly over and feed off water, but they do not float or bathe in deep water. These species benefit from graduated pools, with the depth proportionate to their size (e.g. shallower for smaller terns).

All waterbirds are prone to foot problems such as Pododermatitis (bumblefoot) if they are housed in unsuitable numbers or kept on inappropriate substrate i.e. if overcrowding or stressful group dynamics promotes aggression over perching spots and/or perches have rough or abrasive surfaces. All perches must be easy to keep clean of urates and faeces.

Table 3: Minimum Standards for Housing Waterbirds & Seabirds

Note: This table is not intended to be used independently; it should be used only in conjunction with the information in Chapter 8: Avian Housing Requirements.

Species	**Stage 1 WxLxH**	**Stage 2 WxLxH**	**Stage 3 WxLxH**	**Pool size and depth**	**No of birds**	**Codes**
Duck Moorhens Coots Grebe	40x40x40cm	60x60x60cm	2x4x1.75m Alternative: 4.3m round gazebo style	Pool size: min surface area of water 1m² 50cm deep pool	2	H AW FP ON PT AP
Darter Cormorant	42X67x48cm	1.2m²	2x2x1.75m	Pool size: min surface area of water 1m² 50cm deep pool	1	
Stilt Egret Heron Spoonbills	42X67x48cm	1.2m²	2x2x1.75m	Pool size: min surface area of water 1m² 50cm deep pool - graduated	1	AW AG ST
Oystercatchers Dotterel Plover	32x32x32cm	60x60x60cm	1.5x1.5x1.75m	Pool size: min surface area of water 1m² 25cm deep pool - graduated	1 smaller size 2 larger size	AW
Swan	70x70x70cm	1.2m²	2x2x2m	Pool min surface area of water 2.4m 60cm deep pool	2	PT AP
Pelican	1.2x1.2x1.2m	3x3 m²	3x3M Alternative: 3x9M round gazebo style	Pool size: min surface area of water 3m² 70cm deep pool	1 2-3	PT AP SO ST
Little Penguin	40x40x40cm	1x1 m²	3mx3m	Pool size: min surface area of water 2.4m² 30cm deep pool	3	AG AP H SO
Small seabirds Include terns and seagulls	40x40x40cm	1x1 m²	2x2x1.75m	Pool size: min surface area of water 1m² 30cm deep pool	2	N PT PP
Albatross Giant Petrel	70x70x70cm	1.2 m²	2.5x2.5m	Pool size: min surface area of water 2.7m x 3.3m with 70cm deep pool. Walls 60cm above depth of pool	1	N PT PP SO AG

Table 4: Codes for Special Housing Requirements Used in Table 3, Minimum Housing for Waterbirds & Seabirds

AG	Note that these birds can be extremely aggressive, even with conspecifics. Use caution and observe the birds' interactions when introduced, before housing together unattended.
AP	These birds require pre-release conditioning aviaries that contain pools to swim in and standing/perching surfaces.
AW	These birds require pre-release conditioning aviaries that contain shallow wading pools and a variety of perches, especially up high.
FP	These birds have very sensitive feet. Provide as much wading area (in addition to a "swimming" pool) as possible in all housing to help prevent husbandry injuries.
H	Provide natural vegetative material or human-devised areas for cover.
N	Should be housed on tightly stretched, suspended netting as a substrate whenever bird is not in water.
ON	When an individual of these species is housed in IC and is emaciated (pronounced keel) or not standing, it should be housed on suspended net/shade cloth bottom caging to protect feathers and keel until standing normally and of normal weight. Otherwise, when standing normally and keel is not extremely pronounced, housing substrate is covered with towelling or matting.
PP	These species, during pre-release conditioning, require only pool space. Prior to release, individuals must be able to stay in a pool full-time, without a haul-out area, for a minimum of 48 hours without compromise to their waterproofing.
PT	During recovery, bird should be allowed pool time as long and as often as medical condition allows.
SO	Surface overflow of pool required to maintain water quality. This can be achieved by constantly trickling a hose or by overflowing pool, filtering and recirculating water.
ST	As soon as they are standing, these stiff-tail-feathered birds should have a stump or stump-like perch to avoid feather breakage and soiling.

HOUSING FOR RAPTORS

General Raptor Housing Considerations

Sizing for raptor housing is based on a combination of the size and flight styles of the bird. While the cage information states a minimum rectangular size, consideration may be given to L-shaped enclosures to facilitate evaluation of flight and angling abilities, when space is limited on a suburban block. As with other caging, the rehabilitator is encouraged to expand and enhance these minimum requirements, and create caging most suitable to their location, facility, caseload and experience, keeping in mind the natural behavioural and physical needs of the birds.

The needs of raptors present several challenges to achieve successful release. Generally, these birds are large predators that mostly hunt on the wing. Due to the aggressive nature of some raptor species, some species should never be mixed, and in some species of falcon, male and female should not be mixed.

Appropriate conditioning is crucial not only for foraging, but for territory defence and other behaviours. Large flight aviaries are the easiest way to achieve fitness conditioning, but it should be noted that using large flight aviaries is not the only acceptable technique for pre-release preparation. In several instances flight in an aviary is not adequate, and post-release survival will be unlikely. Raptors that arrive in care before learning to hunt, and after fledging, are most affected. Species which actively pursue agile prey will require more extensive flight exercise, since even the largest aviary will cover only a fraction of the space of an actual hunt and pursuit.

The sport of falconry is not practiced in Western Australia and all rehabilitators wishing to use falconry-based training techniques (free flying and creancing) for pre-release conditioning, assessment and release, must have written approval from DEC to do so. Rehabilitators must obtain ongoing advice on the use of these complicated release techniques such as "hacking back" (for chicks), creancing and free flight training while they learn to use them. Raptor rehabilitators experienced in these techniques can be contacted through the Community Involvement Coordinator at DEC.

During free flying and creance training, smaller-sized cages as noted for Stage 1 and 2 recommendations will be sufficient to house birds. In some instances, Stage 1 is more appropriate until a bird is conditioned to tethering and the training involved in flight conditioning. Raptors in stages immediately prior to release often need more exercise than can be provided by many rehabilitators. Cooperation amongst rehabilitators is essential to ensure that birds are housed with an appropriately skilled rehabilitator with the correct environment for housing the bird.

Construction Materials

Wherever possible, the frame for the structure should be on the outside to avoid the birds trying to perch on it or getting limbs caught between it and the wall material. This also makes cleaning easier. Acceptable materials include:

- sealed (treated) wood, corrugated metal sheeting (Zincalume, steel, tin etc.);
- plastic and moulded fibreglass (indoor housing);
- opaque polycarbonate and fibreglass sheeting (reinforced with other materials);
- milled wooden or metal vertical bars / pickets / slats;
- woven shade cloth;
- plastic-coated chain link; and
- UV-stabilized nylon net (anti-bird for small birds or trawler netting for large birds).

Wire mesh must not be used on any surface where the bird can come into direct contact with it. Good quality wire mesh can be used for external structures as predator proofing. Wire doors on pet carriers used as hospital boxes must be covered on the inside.

High stress raptors such as kites and hawks should be housed in facilities that eliminate or minimise visual and auditory stress. Solid-sided walls and/or vertical slats with no more than one-inch gaps may be advisable. When secluded cages are not available, or when additional visual occlusion is necessary, translucent material (e.g. bed linen) may be hung on the outside of the slatted cage. These materials allow some light to enter the enclosure, and slits or holes in the material allow for better ventilation than solid-sided cages.

Furnishings

Minimum standards:

- Stable and easily cleaned furnishings.
- All perching substrates must be chosen carefully, based on the natural biology and size of the species. Natural branches with fibrous bark, blocks, and ring perches are appropriate for certain species of raptors. Perch coverings may include artificial material such as padded bandaging and true Stadium Astroturf (this is preferred over the fake grass known as "Astroturf") and when used, more than one surface substrate may be offered per perch in each enclosure. Coverings must not be able to unravel.
- Perches should have some degree of "give" for landings.

- Perches must be positioned to avoid the bird hitting walls with wing or tail feathers when landing and taking off of the perch. At least two perches should be placed in each cage (excluding Stage 1), preferably at different heights and different angles. Movements up to perches, down to feed or water, or across to another perch also provide important exercise.
- Pools must be a minimum of 5 - 15cm deep and wider than the length of the raptor.

When circumstances allow, rehabilitated adult birds should be released in a suitable habitat as close as possible to the point of their capture.

Table 5: Minimum Standards for Housing Raptors

Note: This table is not intended to be used independently; it should be used only in conjunction with the information in Chapter 8.

Species	**Stage 1 WxLxH**	**Stage 2 WxLxH**	**Stage 3 WxLxH**	**Codes**
Pacific Baza	35x50x40cm	1.2x1.8x1.8m	2.4x4.8x2.4m	
Letter-winged Kite	35x50x40cm	1.2x1.8x1.8m	2.4x4.8x2.4m	SM
Black Shouldered Kite	35x50x40cm	1.2x1.8x1.8m	2.4x4.8x2.4m	SM
Collared Sparrowhawk	35x50x40cm	1.2x1.8x1.8m	2.4x4.8x2.4m	SM, JH
Australian Hobby / Little Falcon	35x50x40cm	1.2x1.8x1.8m	6x20x4m	SM, FF, JH
Australian Kestrel	35x50x40cm	1.2x1.8x1.8m	2.4x4.8x24m	
Boobook Owl	35x50x40cm	1.2x1.8x1.8m	2.4x4.8x2.4m	
Barn Owl	45x70x55cm	1.2x1.8x1.8m	2.4x4.8x2.4m	
Square-tailed Kite	45x70x55cm	2x2x2m	6x20x4m	JH
Red Goshawk	60x80x70cm	2x2x2m	6x20x4m	SM, FF, JH
Black Breasted Buzzard / Kite	45x70x55cm	2x2x2m	6x20x4m	JH
Spotted Harrier	45x70x55cm	2x2x2m	3x15x3.6m	JH, SM+ floor hide
Swamp Harrier	60x80x70cm	2x2x2m	6x20x4m	JH, SM+ floor hide
Brahminy Kite	45x70x55cm	2x2x2m	3x15x3.6m	SM, JH
Whistling Kite	45x70x55cm	2x2x2m	3x15x3.6m	SM, JH
Little Eagle	45x70x55cm	2x2x2m	3x15x3.6m	SM, JH
Black Kite	45x70x55cm	2x2x2m	3x15x3.6m	SM
Brown Goshawk	45x70x55cm	2x2x2m	3x15x3.6m	SM, FF, JH
Grey Goshawk	45x70x55cm	2x2x2m	3x15x3.6m	SM, FF, JH
Brown Falcon	45x70x55cm	2x2x2m	3x15x3.6m	
Black Falcon	45x70x55cm	2x2x2m	6x20x4m	SM, FF, JH
Grey Falcon	45x70x55cm	2x2x2m	6x20x4m	SM, FF, JH
Peregrine Falcon	45x70x55cm	2x2x2m	6x20x4m	SM, FF, JH
Masked Owl	45x70x55cm	2x2x2m	3x15x3.6m	
Grass Owl	45x70x55cm	2x2x2m	3x15x3.6m	SM+ floor hide
Rufous Owl	45x70x55cm	2x2x2m	3x15x3.6m	
Barking Owl	45x70x55cm	2x2x2m	3x15x3.6m	
Osprey	60x80x70cm	2x2x2m	6x20x4m	
White-bellied Sea Eagle	60x80x70cm	2x2x2m	6x20x4m	JH
Wedge-tailed Eagle	60x80x70cm	2x2x2m	6x20x4m	JH

Table 6: Codes for Special Housing Requirements Used in Table 5, Minimum Housing for Raptors

FF	**F**ree (uncaged) **F**light exercise needed to reach adequate fitness (unless bird has been in care for less than a week)
SM	**S**pecial **M**aterials suggested - lining aviaries with shade cloth will reduce injury in most cases, and avoiding net-roofed aviaries will stop kites from getting toes entangled.
JH	**J**uveniles cannot learn to **H**unt adequately in a cage, and will need to learn these skills during free flight if they are too old to hack back.

CHAPTER 9 - REPTILE AND AMPHIBIAN HOUSING REQUIREMENTS

GENERAL REPTILE HOUSING CONSIDERATIONS

It has been recognised through extensive consultation with experienced herpetologists in Western Australia that wild reptiles require minimal conditioning prior to release. Therefore, in most species, it is appropriate to release on recovery from Stage 1 or at Stage 2.

Enclosure or holding cage sizes listed in Table 7 are minimum sizes that are acceptable for most circumstances. Some reptiles and amphibians may have special keeping requirements that these recommendations will not cover adequately. As for all wildlife species, understanding the specific requirements and behaviours and applying that knowledge to the housing, both in terms of size, substrate and general furnishings, is essential for proper care. For example, a snake species that ambushes prey would require less space than one that pursues prey. The minimum standard is to provide adequate space for the reptile to move and locate food and to provide an appropriate area to hide and/or bask, depending on the needs of that species.

The natural biology of each species will help to determine their preferences for microhabitat, thereby influencing husbandry practices.

Minimum standards for basic husbandry:

- Housed in a secure, escape-proof enclosure of correct size based on minimum standards.
- Appropriate provision of supplementary heating, humidity and temperature gradient relevant to the species.
- Effective provision of lighting according to the species' needs. This may include ultra violet (UV), covering both UVB and UVA, and full or true spectrum lighting.
- Appropriate enclosure furniture to provide an environment conducive to stress reduction and healing.
- Provision of drinking water in such a way that the species identifies it e.g. some reptiles require misting to drink—they will not drink from standing water.
- Provision of food that the reptile will eat.

Construction Materials

- Commercially purchased reptile enclosures, ranging from small holding boxes for lizards to large snake boxes, are available.
- Range of various sized heavy duty plastic or fibreglass containers with secure fitting lids provide suitable short-term housing.
- Treated wooden holding boxes with glass or Perspex front or top lid are suitable. The wood must be sealed and allow for thorough cleaning and disinfecting.
- Glass tanks are suitable but lack insulation and can be heavy to move around and difficult to store.
- Security of the caging, in order to prevent injury to the animal.

Substrates

Selection of an appropriate substrate is extremely important to the long-term health of any reptile.

- Newspaper is safe, hygienic, easy to clean, absorbent and inexpensive.
- Recycled paper cat litter pellets are safe, hygienic and easy to clean.

- Dry leaf litter (from a clean area) may be used in the absence of any obvious wounds.
- Peat or Sphagnum Moss can be used for specific applications with certain fossorial or burrowing reptiles. Observe for fungal build up. The material should be discarded after use.
- Carpet or Astroturf to cover abrasive brickwork, for aquatic tortoise set-ups.
- Paper towelling (unbleached) is recommended for amphibians. Do not use printed paper.
- Sand—should be limited to those that habitually live in sandy areas. Generally, sand is abrasive, and may be ingested, causing impactions.
- For reptiles that are gravid, moistened sand or vermiculite may be considered.

Furnishings

If an animal must be kept for an extended period, cage accessories may contribute to the animal's mental health. An understanding of the species' natural biology and habitat preferences is essential in providing the minimum standard of care in captivity. All reptiles must be allowed to hide, climb and bask as needed.

Table 7: Minimum Standards for Housing Reptiles

Note: This table is not intended to be used independently; it should be used only in conjunction with the information in Chapter 9.

Species	**Stage 1 & 2 WxLxH**	**Stage 3 WxLxH**	**Max # per enclosure**
Stimson's Python Black-headed Python Young pythons up to 1 metre long	1/2 body length x 3/4 body length x 1/3 body length 30x90x50cm	NA	1
Carpet Pythons	1/2 body length x 1/2 body length x 3/4 body length	NA	1
Death Adder	50x30x45cm	NA	1
All other venomous snake species Up to 1.5 metre	45x90x45cm	NA	1
Small Geckos	40x20x30cm	NA	2
Bluetongue Lizards	30x90x40cm (3ft tank)	NA	2
King Skinks	50x90x30cm	NA	1
Dragons	30x90x40cm (3ft tank)	NA	
Varanids Stage 1, 2 & 3 will rely on the length of the monitors body	2x body length 1.5x body width 60cm high	3 x body length 2 x body width 60cm high	1
Adult long Neck Tortoises	50 x 90 x 30cm	100x150x100cm pool with a dry land area. 20cm deep body of water General considerations: 5x animal's length 3x animal's length depth of water 3x animal's width Water must be heated >16°C for feeding to occur	1
Amphibians	50x25x30cm	NA	4

CHAPTER 10 - MAMMAL HOUSING REQUIREMENTS

General guides for mammal housing are difficult to define, due to the variation in size, temperament and life history in mammals. A "one-size or style-fits-all" approach fails when you are housing mammals ranging from bats to kangaroos. However, some principles do apply to all mammal housing. For example, double door or similar construction is effective in preventing escapes; visual barriers between cages and between humans and cages provide stress relief to mammals; pre-release cages should be isolated and placed in an area similar to release habitat, if possible.

Mammals that are sick, injured or being hand reared may be housed in a hospital box, pet carrier, glass tank and a variety of suitable hand rearing options, including basket, esky and hanging pouch. Consideration must be given to the size of the mammal and the rehabilitator's preferences based on experience and knowledge.

The task of hand rearing mammals and the standards required to complete this process is beyond the scope of these Minimum Standards. There are many tried and tested methods and a vast number of experienced rehabilitators that hand rear the wide range of mammal species in Western Australia. For the purpose of the Minimum Standards housing sizes, we have placed all hand rearing cases into Stage 1 for their basic needs. This does not include the information required on the in-depth daily care the mammal requires during this period. This information must be sourced using the vast network of rehabilitators available in WA, in addition to appropriate reference books as listed in these Standards under "Recommended Reading".

STANDARDS FOR BASIC HUSBANDRY

Minimum standards are:

- Supplementary heat for mammals in Stage 1 (and possibly Stage 2) must be provided.
- Appropriate humidity must be provided.
- Suitable materials for nesting and security must be provided.
- Suitable furniture and substrate must be provided.
- Companionship must be provided if appropriate to the species.

HAND REARED MACROPODS AND REHABILITATION STANDARDS

Hand reared macropods are being successfully rehabilitated and released with the following methods as being agreed minimum standards:

- Juvenile macropods **must** be placed with others of the same species or family as they enter into the Stage 2 process, **if not earlier**.
- Stage 2 joeys will need access to a safe joey exercise area with unlimited access back into their "pouch".
- Companion animals and birds such as cats and dogs **must** be excluded from all areas where joeys are exercising during Stage 2 and 3 as they begin to acclimatize outside of the pouch and explore the area.
- The joey exercise area will be a secure environment where the joey can see out beyond the immediate area and receive environmental stimulation such as smells and changes in weather.
- Stage 3 – It is at the discretion of the rehabilitator to complete Stage 3 using an additional two-stage approach.
  - Stage 1: joeys may move into a small exercise yard approximately 10mx10m.
  - Stage 2: move into the pre-release conditioning yard as noted as Stage 3 Minimum Standard sizing (20mx30m).

- Final Stage 3 will include no "hands-on" contact with rehabilitator. The macropod will be prepared environmentally and nutritionally for a soft or hard release.

CONSTRUCTION & FURNITURE

Echidna - Deep packed substrate; a minimum of 20cm to provide for digging. Large termite logs for provision of food sourcing enrichment and physical activity; a concrete base or wire undermine yard is essential for housing in Stage 3.
1.2m high smooth walls to stop escaping and to avoid predators entering. 50cm fencing set below the substrate to reduce escape by digging. If using chain link fence, a smooth barrier minimum of 60cm high must be installed to avoid climbing out. Effective shade must be provided to allow for temperature gradient and access to sunlight.

Bats – In addition to abrading, wire mesh corrodes with urine. A non-abrasive surface, such as polyethylene mesh, is preferable for all enclosure and holding-box construction. Provision of shelter against inclement weather is achieved with the minimum standard of one third of the enclosure completely sheltered. Avoid placing any sharp objects in the environment to reduce wing membrane trauma when flying and landing. Provide suspended landing spots e.g. towels, flannelette squares, at each end of the enclosure to encourage flight and landing activity.

- Flying Fox - Roosting sites e.g. cloth squares pegged to the roof of the enclosure, should be provided as high up as possible. Food stations and water bottles for holding blossoms must be provided with easy access.

- Insectivorous Bat - Roosting pouches or boxes must be placed at each end of the enclosure preferably along the ceiling. A bright light source (to attract insects) should be set up on the outside of the enclosure, in the middle of the ceiling. This provides the bat with a flight path from one length of the enclosure to the other with the opportunity to catch insects along the way. If the light source is positioned inside the enclosure it must have a wire cover over the globe to prevent bats from having contact with hot light fixtures. Provision of appropriate water source.

Small Dasyurid and Antechinus - Glass tanks or wooden holding boxes with fine 6.5mm² mesh doors or lids for pre-release conditioning of very small mammals are ideal. Generalisations are difficult to make for such a large and diverse group, so refer to the natural biology of the species undergoing rehabilitation for a better understanding of appropriate habitat requirements. Small nest boxes must be provided. A basking lamp may be utilised.

Chuditch – Semi-arboreal mammal, so ensure provision of both ground space with substrate and some logs for climbing. A nest box must be provided. If possible, provide a nest box at ground level and one off the ground with access to a climbing branch. A hammock made from flannelette material is often favoured if provided. A basking lamp may be utilised.

Honey and Pygmy Possums - Enclosure must have fine 6.5mm² mesh on the outside to prevent escapes and vermin predation. Require a complex arrangement of vertical and horizontal climbing branches. A nest box must directly communicate with a climbing branch. Leaf litter substrate. If an enclosure is not available for pre-release conditioning, a veranda aviary may be considered with additional fine mesh added. A large glass tank may be used, but this does not allow for acclimatising to the inclement weather.

Sugar Gliders - Standard enclosure set up, but minimise furniture to allow for gliding. Sheltered nest box with communicating branch to food. Consider provision of supplementary heat to encourage activity for quicker release.

Possums – Nocturnal arboreal mammals, so height to the enclosure is important. Provision of climbing branches at various heights to promote climbing is required. Aim to maximise the use of all vertical space to reduce their need to come to the ground for any reason. Good foliage cover provides security and will encourage activity.

- Brushtail Possum – Heavier duty climbing branches, ropes can be used for climbing. Appropriate sized nest box and nesting material must be provided. Browse holders positioned high up near the nest boxes to allow for provision of native flora.

- Ringtail Possum – Lighter weight climbing branches, ropes can be used for climbing. Drey and/or nest box with nesting material must be provided. Foliage holders positioned high up near the nest boxes to allow for provision of native foliage and flowers.

Bandicoot – Nocturnal, terrestrial mammal. Provision of appropriate floor space and substrate for foraging to a minimum of 10cm deep. Provision of 0.5m solid structure up the sides of the enclosure to avoid climbing/jumping. Enclosure mesh no greater than 1.2cm. A nest box must be provided but bandicoots will nest just under the leaf litter, tussocks and in hollow logs.

Bilby – Nocturnal, terrestrial mammal. Require burrowing environment. Stage 2 holding enclosure must be filled with dry clay-free river sand to a minimum depth of 23cm. Service area can be reduced to 5cm depth. 15cm diameter black polypipe, laid out in U formation, creating a 6.5m tunnel directly to the nest hutch. Nest hutch minimum size 40cm² with top-lifting lid in addition to front access attaching directly to the piping. Stage 3 enclosures or yards require natural vegetation and soil/substrate containing sufficient fine grain/clay to hold burrow structures up to 2m deep with 20cm diameter tunnels without collapse. Natural shrub/tree vegetation with good root systems. This allows for normal burrowing and food foraging behaviour. Thermoregulation is essential in the acclimatisation of bilbies that are being released back into the wild and natural substrate allows this through self-selection of burrow depths. To prevent escape, a minimum of 60cm wide chicken wire, mesh skirt on the inside of fences at a depth of ~ 50cm is usually sufficient in a minimum size enclosure of ~ 10mx10m. This size enclosure could hold several young animals or a pair of adults. Young bilbies have been known to climb and if a roof is not utilised; an internal overhang should be included on all sides and corners. This is in addition to an outward-facing overhang described below, to prevent predator incursions.

Small macropods - Predator-proof fencing is essential. Enclosure mesh must not exceed 5.5cm². Outward-facing overhang of approximately 60cm, at an angle between horizontal and 45°. Secure spots to shelter and nest, including shrubs, tussocks and small 'A' framed wooden shelters (avoid placing anything on the fence line). Protected feeding station or "shed" facing away from prevailing winds. Rounded corners on fences may help to prevent animals and birds injuring themselves by guiding animals and birds around corners, instead of ending in an abrupt 90° turn.

Large macropods – Large open yard, relatively free of obstacles; east facing shelters large enough to allow more than one animal to congregate. Protected feeding station or "shed" facing away from prevailing winds. Provision of dust baths.

Wallaby – Well covered habitat, shrubs, 'A' framed hides. Rock Wallaby requires elevated platforms; these can be made of piles of rocks, weatherproof tables, platforms and branching trees. Small cave like structures will provide security and promote natural behaviour. Protected feeding station or "shed" facing away from prevailing winds.

YARD REQUIREMENTS FOR MACROPODS

Yards of varying sizes are required for appropriate rehabilitation. The size will vary depending on the stage of development the macropod is currently at.

Minimum standards for pre – release yards for Large Macropods and Wallabies are:

- Predator-proof fencing incorporating minimum of 50mm² mesh fencing to a minimum height 1.8m.
- Wire placed 35cm beneath the ground, or external deterrents e.g. barbed wire, or a moat around the base of the mesh.
- If climbing species are to be enclosed by unroofed fences, then the fences must be made of material that is not climbable and a minimum height 2m or rimmed by a 45-degree outrigger (0.5m wide facing into the enclosure).

- Minimal furniture to reduce accidents and injuries.
- Shade through the yard.
- Self feeders and water troughs for minimum disturbance.
- There are variations in developmental stages of macropod joeys when they reach Stages 2 & 3. This will be determined by access to other macropods, health and the experience of the rehabilitator. This will have an impact on the size of the yard that the macropod is placed in. To allow for rehabilitator discretion, two sizes have been included at Stage 3 as Minimum Standard, and the larger sized yards are always preferred where available.

It is uncommon that fully–grown, wild adult kangaroos survive the injuries associated with motor vehicle accidents and therefore they are not commonly in rehabilitation and release programs.

Table 8: Minimum standards for Housing Mammals:

Note: This table is not intended to be used independently; it should be used only in conjunction with the information in Chapter 10.

Species	**Stage 1 WxLxH**	**Stage 2 WxLxH**	**Stage 3 WxLxH**	**Max # in Stage 3**
Insectivorous Bat	18x25x20cm	59x60x70cm	3x5x2m	6-8
Fruit Bat	30x43x36cm	59x93x59cm	4.5X13x4m	4-6
Dunnarts and Antechinus species	20x32x32cm	30x91x40cm	30x91x40	6
Pygmy Possum Honey Possum	20x32xx32cm	60x26x30cm	1x1x1m	2
Sugar Glider	20x32xx32cm	90x90x90cm	2x5x1.75m	4
Ring tail Possum	30x43x36cm	90x90x90cm	.90x1.8x1.8m	2 must be related)
Brush tail Possum	30x43x36cm	1x1x2m	2x3x1.75m	1
Bandicoot	juveniles 20x32x32cm adults 30x43x36cm	1x1x0.8m	2x3x1m	1
Bilby	30x43x36cm	2x4x1.75m	10x10m	2
Chuditch	juveniles 20x32x32cm adults 30x43x36cm	1x1x.8m	2x3x1.75m	2
Echidna	50x71x51cm	60x91x53cm	6x6x1.2m	2
Small macropods	50x71x51cm	60x91x53cm	15m²	15
Wallabies	60x91x53cm	5x5m	20x30m	7-10
Large macropods	60x91x53cm	5x5m	See notes on 2 stages in Stage 3 Stage 1 - 10x10m Stage 2 - 20x30m	7-10

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Wildlife Conservation Act, 1950

Wildlife Conservation Regulations ,1970

Wildlife Conservation (Reptiles and Amphibians) Regulations, 2002

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GLOSSARY

Acclimatisation – To habituate to a new climate or environment.
Altricial – Very young birds that are hatched and require feeding by parent bird.
Arboreal – Tree-climbing.
Astroturf – Fake grass.
Bumblefoot – Swelling on the feet of birds, where infection enters through an abrasion.
Carcass – The dead body of an animal.
Colonial - Living in groups or colonies.
Conditioning – The learning process.
Conspecific – Belonging to the same species.
Contagious – Carrying or spreading a disease.
Creance – A cord secured to the leg of a raptor to prevent escape during training.
Diurnal – Active during daylight.
Disposition – Mental inclination, or willingness.
Euthanase – The induction of death, with minimal pain, stress or anxiety.
Falconry – The art of training falcons.
Fauna –Collective term for animals.
Foliage –Leaves, flowers and branches.
Hard release – Release of an animal with no supplementary food and/or shelter.
Herpetologist – One who studies reptiles and amphibians.
Imping – A technique in which unbroken feathers from one bird are used to repair the feathers of another.
Imprinting – Make an impression that produces an effect; in fauna, the process whereby an animal becomes too familiar with humans and/or their companion animals.
Isolation – Complete separation from others.
Microhabitat – Very small, isolated habitat.
Migratory – Making regular seasonal geographical movements.
Nocturnal – Active during the night.
Optimum – The best or most favourable.
Pelage – Hair, fur, wool or other soft covering of a mammal.
Pelagic – Of the ocean surface or open sea.
Post Mortem – Examination of the body after death.
Precocial – Active soon after birth or hatching.
Quarantine - The act of isolating individuals, for the duration of the incubation period of most diseases for which they may have been exposed.
Records – Written document for the purpose of preserving evidence.
Rehabilitation – Restoration to former health, rights and privileges.
Soft release – Release of animal with provision of supplementary food and/or shelter for a time.
Substrate – Material placed on a cage bottom.
Terrestrial – Living on the ground.
Thermoregulation – Regulation of body temperature.
Varanid – Genus of medium to large terrestrial lizards.

Appendix A:

Facility Review

The information and questions contained in this form are a means for rehabilitation facilities and individual rehabilitators to do a self-evaluation or self review. The purpose is to provide wildlife care-givers suggestions to save time (for example, keeping reference materials at the phone), to ensure wildlife receives appropriate housing and medical treatment (exam area, caging and veterinary treatment), and to protect both wildlife and humans from disease and contamination (food preparation, disinfecting, housekeeping).

Not all items contained in the form will apply to everyone; for example, an individual rehabilitator probably does not require a grievance committee, but this form does provide an easy reference to be sure important considerations are not overlooked when changes such as facility growth occur.

Facility Review

1. ORGANISATIONAL STANDARDS

Safety
Is there a fire alarm?
Is there a fire extinguisher(s)?
Are eating, drinking, smoking, etc., restricted to designated areas?
Is there a first-aid kit available for staff/volunteers?
Are material data safety sheets (MSDSs) readily available/easily accessible for those chemicals used at the facility (disinfectants, cleansers, certain drugs, etc.)?

Telephone Services
For those providing help, assistance, and directions to the public, are protocols established to provide assistance in the following areas:
Humanely preventing or reducing wildlife problems, conflict situations, and injury?
Determining if animals and birds in fact need to be rescued?
Providing strategies and techniques to give opportunities for mother animals and birds to retrieve temporarily displaced young or to re-nest?
Suggesting safe capture, restraint and transport techniques to minimise risk of injury to animals and birds and to humans?

Procedures
Does the organisation have operational policies available to staff members and volunteers (e.g., operations manual, rules derived from Board decisions, or training materials)?
Does the individual or organisation comply with local ordinances and have current state/provincial/federal permits for the work being done?
Is there a grievance policy for staff/volunteers?
Is there a training policy for staff/volunteers?
Are there continuing training opportunities for staff (paid and volunteer) who have completed basic skills training (staff training sessions, DEC Courses, etc.)?
Is there a liability insurance policy for volunteers to protect the facility and/or organisation? Is there a workers' compensation policy for employees?
What after-hours services are available for emergency cases (on-call person, emergency veterinary clinic services, etc.)?
Are there written policies to instruct the volunteers regarding rules of the organisation as they relate to animal care, reporting procedures, rules on conduct?

Ongoing Education
Are manuals/books available on providing humane solutions to human-wildlife conflicts?
Are publications available which describe each species and its natural biology?
Is pertinent information collected on wildlife rehabilitation?

Do you collect such information and share it with other members?
Do you attend continuing education classes or conferences on wildlife rehabilitation?

2. RECEIVING AREA

Public Information
Are there written policies or procedures for staff and volunteers dealing with wildlife problems?
Do you have information available to the public on the services provided for wildlife?

Facilities
Is the reception area neat and presentable?
Is it organised so that resident patients are not subject to stress during the intake of new animals and birds?

3. EXAMINATION AREA

Is the area clean?
Is the area set up so that animals and birds can be examined safely?
Are first-aid supplies available?
Are there scales available to weigh animals and birds as part of intake and assessment?
Are animals and birds awaiting exam/treatment provided a warm, quiet and dark place?
Are facilities arranged and/or constructed to minimise stress on the animals and birds?
Are the sound and activity levels minimised to reduce stress on the animal?
Are capture and handling equipment easily accessible and in good working order? Are they used safely?
Are capture, handling, and restraint procedures safe for animals and birds and humans?
Are the people handling wildlife trained in safe handling techniques?

4. FACILITIES FOR FIRST AID/INTENSIVE CARE

Are the following available for use when necessary?
- Heat sources (hotbox, lamps, heat pads)
Is the area clean?
Is it a low-use area?
Are needed medications on hand?
Are other medications available by prescription or through supporting veterinary clinics?
Are prescription drugs kept in locked, secure location?
Is there a log for using prescription drugs?
Are emergency medications available?
Are these facilities available at a veterinary clinic if necessary:
- Experienced wildlife veterinarian/nurse?
- Anaesthetic equipment?
- X-ray equipment?
- Housing facilities?

5. INITIAL CARE FACILITIES

Do the cages meet minimum caging standards for the species handled?
Are they constructed so that they can be cleaned and disinfected (e.g. stainless steel, fibreglass, sealed wood, 'pet paks')?
Are the cages cleaned regularly (as appropriate for the species and cage type)?
Is the area adequately ventilated in an appropriate manner?
Is there adequate lighting (full-spectrum light at the appropriate hours)?
Are isolation facilities available?
Is the area away from the main flow of human activity?
Is there access to the area by domestic pets?

6. PRIMARY EXERCISE CAGING

Do they meet minimum caging standards for the species being handled?
Are they cleanable?
Is there a regular cleaning schedule?
Are they safe for the handlers and animals and birds being held (e.g. no loose or sharp wires or nails, double doors, etc.)?
Are they secure (e.g., locking, sturdy, safe from predators)?

7. HYGIENE

Is there a standard procedure and schedule for cleaning and disinfecting cages, feeding utensils, syringes, food storage containers, and food, water, and bathing bowls?
Are cleaning and disinfecting supplies available and stored properly?
Is human protective gear (gloves, masks, goggles) available?
Are instructions on the proper use of disinfectants displayed?
Is there a designated area for storage, cleaning and disinfecting of dirty items?
Is there a designated area for storage of clean and disinfected items?

8. HOUSEKEEPING & MAINTENANCE

Is there a reasonable schedule for:
- Daily cleaning?
- Weekly cleaning?
-Seasonal cleaning?
Is there a continuing program for repair and upkeep of the facility?

9. FOOD PREPARATION & STORAGE

Is the area clean, orderly?
Are adequate foodstuffs and supplies available?
Are foodstuffs stored separately e.g. fruit and vegetables not next to meat products?
Are perishable foodstuffs dated (open formula)?

Appendix B:

Animal Admission Form

Species: _____ Age (e.g. adult/chick/juv): _____

Sex:_____Date: ID(e.g. legband #): _____

Rescuers name & address: _____

Contact number(am/pm): _____Mobile:_____

HISTORY

Exact location animal was found (include details of what park, beach or street, in a backyard, building site, footpath, etc): _____

_____

_____

Date and time you found the animal? _____

What is wrong with the animal (any obvious injuries)? _____

_____

_____

What was the animal doing when found - i.e. - lying curled up, flapping frantically but not flying, lying on it's back, not standing, etc)? _____

_____

_____

_____

_____

Has any medical treatment been given, if so what? _____

_____

_____

_____

Has the animal been seen by a vet, if so, which one? _____

Did you feed the animal? _____ If yes, what & how? _____

_____

_____

How has the animal been housed? (e.g.- in a box, cage, heating supplied)? _____

_____

_____

What else did you do to help the animal? _____

Are you willing to pick the animal up for release if needed? _____

Appendix C:

Animal Examination Form

Bird

Date: ___/____/____ Species: _____ Arrival weight_____

Case#: _____ Time _____

_____

Body Condition: Emaciated Underweight Normal Overweight

Comments on Body Condition: _____

Age/Sex: _____

Hydration: Good Fair Poor

Attitude:

_____

_____

Nares: Clear Remarks: _____

Respiration: Remarks: _____

Crop: Full Empty Remarks: _____

Gi Tract/Abdm: Remarks: _____

Droppings: None Remarks: _____

Eyes: Remarks: _____

Ears: Remarks: _____

Feathers: Remarks _____

Ecto-Parasites: Remarks_____

Skin: Remarks: _____

Feet: Remarks: _____

Nervous System: Remarks: _____

_____

Musculoskeletal: Remarks: _____

_____

Injuries/Problems (Wounds, Etc.): _____

_____

_____

_____

Note: BAR = Bright, Alert, Responsive _____

3-Day Assessment: