

Recommended Guidelines for the Captive Management of Wombats (*Vombatus ursinus* & *Lasiorhinus latifrons*) in South Australia.

Note: The *Animal Welfare Act 1985* creates an offence for a person who fails to provide appropriate and adequate, food, water, living conditions (whether temporary or permanent), or exercise, or fails to take reasonable steps to mitigate harm suffered by an animal in their care. In addition, the *National Parks and Wildlife (Wildlife) Regulations 2001* prescribes standards for keeping protected animals.

Disclaimer:

This publication contains advisory information only. While considerable care has been taken in researching and compiling the information, neither the Department of Environment and Natural Resources nor the South Australian Government accepts responsibility for errors or omissions or for any decisions or actions taken on the basis of this document.

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NOTE: *These guidelines are to be read in conjunction with the “General Guidelines for the Management of Protected Wildlife in Captivity in South Australia”.*

1. BACKGROUND INFORMATION

Two species of wombats can be found in South Australia: the Common Wombat (*Vombatus ursinus*) and the Southern Hairy-nosed Wombat (*Lasiorhinus latifrons*). In South Australia, the Common Wombat is restricted to the south-east corner of the State, while the Southern Hairy-nosed Wombat is found along the southern coastal regions along the Nullarbor Plain and as far east as the Murraylands.

Because the natural diet of wombats is nutritionally poor, low in protein and high in fibre, they must conserve as much energy as possible and have an extraordinarily slow metabolism. They also have a more efficient digestive system than other grazing animals, taking around 14 days to complete digestion which allows them to extract maximum nutrition from their diet.

Wombats minimise their water loss by staying in their burrow during the heat of the day. They require less water than almost any other mammal, which aids their survival in arid conditions.

In the wild the Common Wombat occupies a range of up to 23 ha, while the Hairy-nosed Wombat has much smaller ranges of less than 4 ha. Wombats are wide-ranging, nocturnal foragers with strong instincts for burrowing behaviours. They are extremely strong and can be very destructive, and are capable of tearing holes in fences, doors, and even walls. These characteristics make them difficult to house and generally unsuitable as pets.

Wombats are long-lived animals, with one captive bred Southern Hairy-nosed Wombat being recorded to live to over 34 years in age.

2. SCOPE

These guidelines apply to members of the public that apply for and/or obtain a DENR “rescue permit” or a “permit to keep” a wombat in captivity.

These procedures do not apply to wombats held in;

- Zoological Institutions
- Veterinary Clinics
- Approved Research Programs

3. OBJECTIVES

The objectives of these guidelines are to:

- Provide recommendations which protect wombat welfare, identify when it is not appropriate to return a wombat to the wild and to establish controls which assist in meeting conservation objectives; and
- Provide recommended guidelines for the maintenance of wombats kept in captivity; and

- Ensure a consistent State wide policy for the rescue, rehabilitation, release, captive holding and euthanasia of wombats; and
- Provide a clear and consistent framework for DENR in developing and maintaining a partnership with wildlife rehabilitation groups and individuals in their approach to holding wombats for any reason; and
- Ensure that holders of wombats are appropriately endorsed and accountable for their activities, and that rehabilitation activities are undertaken in the most effective and efficient manner; and
- Contribute to the maintenance of biodiversity through the successful return of temporarily compromised wombats to their natural environments where possible.

4. GUIDELINE DETAILS

4.1 Wombat Rehabilitation

The Department of Environment and Natural Resources (DENR) Standard Operating Procedure for the Rescue and Release of Native Species states;

“There is no conservation value in releasing a common animal back to the wild, particularly if it is behaviourally, physically or otherwise impaired.”

However, this comment is qualified by the statement that;

“The welfare of an individual animal and the preservation of an individual animal’s life are intrinsically important.”

DENR recognises that the work of wildlife rehabilitators contributes to conservation through research, community education and promotion of a respect for native wildlife.

All individual wombat carers will be required to follow the directions and procedures provided to them by a Warden or other nominated DENR Officer.

Considerations for the keeping of orphaned, sick or injured wombats include that carers must understand that:

- 1) The aim of keeping wombats under a Rescue Permit is to rehabilitate and return the animals to prescribed habitat in the wild; and
- 2) Rescued wombats are to be treated as wild animals and neither handled nor treated in a manner which domesticates or humanises them; and
- 3) If a wombat is unable to be rehabilitated to the wild it may need to be euthanased; and
- 4) A Warden may remove a wombat from private care at any time if legislative requirements are not being met or if the health or well-being of a wombat is compromised due to inappropriate care; and

- 5) The eventual fate of each wombat will be determined by a Warden or other nominated DENR Officer.

Potential wombat carers will need to meet a number of requirements before being issued a Recue Permit, and must be able to demonstrate that they:

- Have successfully cared for orphaned, sick or injured wombats or other marsupial species; and
- Can provide appropriate housing and facilities for rescued wombats; and
- Have access to adequate quantities of appropriate food; and
- Have the resources to acquire all necessary feeds, materials, veterinary services, medical supplies and equipment associated with the care of orphaned, sick or injured wombats; and
- Have the ability and willingness to maintain and submit accurate records as required.

Each wombat must be assessed by a veterinarian, Warden or other nominated DENR Officer and certified as fit to return to the wild before it is released.

Further information in relation to the rescue, holding and release of Protected Wildlife can be found in the “General Guidelines for the Management of Protected Wildlife in Captivity in South Australia”.

4.2 Manner of Housing

- 1) Each wombat must be housed in a manner which does not pose a risk to:
 - Its wellbeing; or
 - Wild animals; or
 - The safety of carers; or
 - The safety of other persons.
- 2) The size and shape of the enclosure must provide for:
 - Freedom of movement for the wombat, both vertically and horizontally; and
 - Sufficient space to enable it to be protected from undue dominance and conflict with the same or other species; and
 - Appropriate exercise opportunities; and
 - Its husbandry needs; and
 - The minimisation of stress.

Note: *Common Wombats generally prefer to be solitary in captivity, whereas Hairy-nosed Wombats are more social and can usually be held in pairs or small groups if sufficient living areas and alternative burrows are provided.*

- 3) The enclosure must be inspected and evaluated when feeding and cleaning to monitor hygiene levels and to detect potential housing problems.

4.3 Spatial Requirements

In a paper published by the Post Graduate Foundation in Veterinary Science, it was recommended that a minimum area of 400m² is required to adequately house a pair of wombats long term, however other Australian jurisdictions recommend enclosure sizes ranging from a minimum of 45 m² to house a single animal and a minimum of 75 m² for a pair of animals.

The following minimum enclosure sizes for maintaining adult wombats in South Australia are based on industry standards.

South Australian Minimum Wombat (adult) Enclosure Sizes.

Common Name	Latin Name	1 x Wombat: Minimum Enclosure Area (m ²)	2 x Wombats Minimum Enclosure Area (m ²)	Each Additional Wombat > 2 Minimum Additional Area (m ²)	Minimum Perimeter Fence Height (m)
Hairy-nosed Wombat	<i>Lasiorchinus latifrons</i>	45	55	10	1.2
Common Wombat	<i>Vombatus ursinus</i>	45	55	10	1.2

4.4 Enclosure Construction

There are a number of general principles that should be followed in order to satisfy minimum conditions for the keeping of wombats in captivity. Conditions include:

- 1) The enclosure must be strongly constructed as wombats are highly destructive due to their very powerful build and digging habits.
- 2) An enclosure must be constructed such that:
 - a. A wombat cannot escape in circumstances that can reasonably be foreseen and guarded against; and
 - b. The risk of injury to the wombat is minimised; and
 - c. Animal carers are safe if they comply with appropriately displayed warning signage; and
 - d. Wombats are not exposed to excessive noise or vibration; and
 - e. Adequate ventilation is provided to prevent the build-up of heat at ground level within the enclosure.
- 3) The enclosures can be of an open, semi-enclosed or totally enclosed design.
- 4) The enclosure walls must be a minimum of 1.2m high. Suitable construction techniques can include the use of smooth concrete, brick or metal materials. Steel mesh or pool fencing can also be used however wombats can climb mesh and it should not allow noses or feet to fit through mesh openings to avoid wombats injuring themselves by biting or clawing at the wire. See through fencing can also contribute to anxiety and the development of stereotypic behaviours, particularly when housed next to other animals.

- 5) Timber should not be used in the construction of the enclosure as wombats are likely to chew through it.
- 6) In an enclosure where wombats can dig or burrow, the enclosure floor must be constructed:
 - a) With a steel mesh underlay or concrete layer covered by sufficient suitable substrate to allow the wombat to dig or burrow without escaping; or
 - b) With an enclosing fence extending below ground level to a depth of at least 1 metre and then extending horizontally within the enclosure for at least 1 metre so that the animal can dig or burrow without escaping; or
 - c) With an enclosing fence of galvanised metal mesh or concrete which extends horizontally within the enclosure, below the soil surface, for at least 1 metre so that the animal can dig or burrow without escaping; or
 - d) By any other design which allows the wombat to dig or burrow without escaping.
- 7) In an enclosure where wombats cannot construct burrows, appropriate measures must be taken to provide them with adequate shelter so that they can thermoregulate and feel secure. This shelter can be either in the form of mock rock burrows, concrete pipes or hollow tree trunks and overstorey planting.
- 8) Where wombats can construct their own natural burrows, the substrate must be composed of adequate clay material to minimise the occurrence of burrow collapse.
- 9) At least one sleeping chamber must be provided for each wombat housed within an enclosure.
- 10) Free access to sleeping chambers must be available at all times.
- 11) Each enclosure must protect wombats from interference by wild animals, domestic pets or people.
- 12) Enclosures must be maintained in good repair.

It is recommended that a smaller holding yard is constructed within the enclosure in which the wombat can be held while the carer cleans the enclosure.

Sleeping quarters should be constructed to enable carers to access animals for health and other husbandry purposes.

Wild wombats have been observed sunning themselves during the cooler months of the year, and access to sunning areas should be provided.

4.5 Substrate and Drainage

- 1) The substrate must not be abrasive or irritating to the animals. Suitable substrates include soil, leaf litter or sand that is well drained. Substrates such as bare concrete or gravel are not suitable.

- 2) To avoid the accumulation of faeces and urine in or on substrate around watering and feeding points:
 - a) A readily cleanable or replaceable substrate must be provided around fixed watering/feeding points; or
 - b) The feeding/watering points must be easily moved.
- 3) An enclosure (including any constructed burrows) must have an effective drainage system.
- 4) Open drains should be inaccessible to wombats, unless they only carry surface water.

4.6 Weather Protection

- 1) Sufficient shelter must be provided to allow protection from wind, rain and extremes in temperature.
- 2) Access to adequate shade during warm weather (i.e. $>25^{\circ}\text{C}$) must always be provided. Consideration should be given to providing misting or other cooling techniques if ambient temperatures are over 25°C .

Note: *Although common wombats live in temperate environments and hairy nosed wombats can live in semi-arid environments, the temperature in their burrows is approximately $17-20^{\circ}\text{C}$ and the humidity is 60-70% year round. Wombats do not sweat, which is useful for conserving water, but this makes them very susceptible to heat stress. Common Wombats can show signs of overheating when temperatures exceed 24°C or at $33-35^{\circ}\text{C}$ for Hairy-nosed Wombats. Deaths are known to occur at temperatures above 38°C , therefore it is important to provide shade and cool areas as retreats during hot weather.*

4.7 Gates, Doors and Slides

- 1) Slides and entrances to an enclosure must be designed to minimise the potential for escape of enclosed wombats or the entry of wild animals.
- 2) Entrances should facilitate the rapid exit of a person from the enclosure.
- 3) Entrances should be lockable to prevent unauthorised access to the enclosure.

4.8 Enclosure Furniture

- 1) An enclosure should include such items as bedding material, branches and burrows, to aid and encourage normal behaviour.
- 2) Objects, furniture, apparatus, decorations or other items that could interfere with the welfare of the animals or with efficient husbandry should not be kept in, or allowed to remain in, the enclosure.

4.9 Electrical and Other Equipment

Electrical apparatus and other plant and fixed equipment must be installed so that:

- a) It does not endanger the animals or carers; and
- b) The animals cannot disrupt its operation; and
- c) It does not pose a fire risk.

4.10 Indoor Housing of Animals

- 1) Lighting in indoor enclosures must be adequate to provide for the animals needs, and to facilitate proper cleaning and undertake routine health, hygiene and maintenance checks.
- 2) Indoor housing for wombats must be ventilated such that:
 - a) The health of the wombat is maintained; and
 - b) Undue draughts, odours and moisture condensation are minimised.
- 3) Indoor lighting should only be switched on for around 11 to 13 hours a day to simulate normal day-length.

4.11 Hygiene

- 1) Excrement and other animal waste, leftover food, rubbish and foreign objects should be removed daily to minimise vermin infestation, disease hazards and to prevent the ingestion of potentially harmful objects.
- 2) Contaminated substrate material must be removed and replaced as necessary.

When disinfecting solid surfaces within the enclosure these surfaces should be rinsed before animals come in contact with them again. All disinfectants and detergents used are to be non-toxic and used in accordance with the manufacturers labelled directions.

4.12 Behavioural Enrichment

To avoid the development of stereotypic behaviours in captivity, behavioural enrichment should be provided for wombats in long term care.

Behavioural enrichment for wombats can include:

- Placing suitable browse in the enclosure
- Adding grass tussocks
- Soil substrate that allows for digging
- Adding large logs to climb in or on
- Placing logs or large rocks in the path or entrance to sleeping dens
- Scatter feeds
- Mulch piles
- Installing “activity devices” in the enclosure such as;
 - Scratching brush on tree (see Figure 1)
 - Cardboard box food dispenser (see Figure 2)
 - “Pendulum device/weighted rope” (see Figure 3)

(NOTE: The following photographs have been used with the permission of Donna Treby.)



Figure 1: Scratching brush on tree



Figure 2: Cardboard box food dispenser

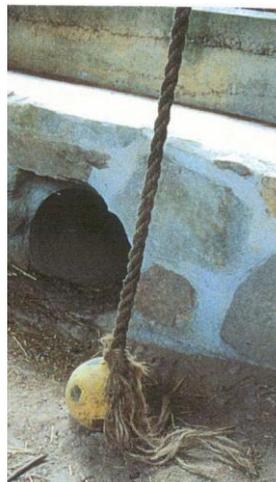


Figure 3: “Pendulum device/weighted rope”

Care must be taken when providing enrichment devices to ensure that they will not cause harm to the animals if eaten or chewed (i.e.; no plastic, metal staples etc.).

See “[Further Information](#)” for additional sources of behavioural enrichment ideas and suggestions.

4.13 Diet and Feeding

Adult Wombats are strict herbivores in the wild and feed mainly on a variety of native grasses, sedges, roots, bark and bulbs of shrubs or trees. Preferred grasses include Tussock Grass (*Poa sp.*), Kangaroo Grass (*Themeda australis*), Spear Grass (*Stipa sp.*) and Wallaby Grass (*Danthonia penicillata*), however introduced grasses are also eaten.

Wombats have the lowest maintenance requirements for dietary energy and protein of all herbivorous marsupials so high energy diets can quickly lead to obesity and other health problems. Wombats must be supplied a high fibre, low crude protein diet in sufficient quantity to ensure that body condition is maintained. High protein carnivore or omnivore diets must not be offered.

4.14 Adult Diet

In captivity, the basis of a wombats' diet should be fresh cut grass and/or palatable but low quality hay (ad lib).

Other food items which can be provided occasionally in small quantities include:

- Kangaroo Pellets (made specifically for Australian marsupials and have vitamins and minerals included).
- Other pellets/grains developed for ruminants can be offered, however the protein levels must be below 12%.
- Food such as rolled oats, apple, carrot, corn, lucerne, sweet potato, etc can be offered in small quantities, however these high energy, high protein and low fibre diets should be avoided for long term maintenance.
- Non-toxic branches should be offered to allow bark chewing to stop incisor overgrowth.

4.15 Hand Rearing Orphaned Joeys

Hand-raising any animal requires a lot of time, effort and patience and should not be undertaken by inexperienced carers unless they are supervised or assisted by an experienced carer. The viability of a wombat joey should be assessed before deciding to hand raise it, as any attempt to raise a joey that is not viable may compromise its ability to survive when it is released, or compromise its quality of life in a captive environment.

It is strongly recommended that the advice of an experienced carer and/or veterinarian experienced with wildlife is obtained before attempting to hand raise a wombat joey.

Note: *It is essential to establish the wombats' age before deciding to hand raise. This may be determined by a combination of head and leg measurements, weight and developmental milestones.*

The correct type, volume and frequency of food being offered is dependant upon the age of the wombat joey. Generally, joeys less than eight months of age will be dependant upon being bottle fed, with older animals eating a greater proportion of solid food similar to that of an adult diet.

Wombats are generally weaned between 12 and 15 months of age or when their body weight is about 7 to 19 kg, however this will differ between the species and will vary between individual animals. Around weaning age they should be allowed access to soil to help in the formation of gut bacteria. Alternatively, the faecal material from healthy adult wombats or acidophilus powder can be provided.

Wombat joeys that have their mouths totally fused (less than 3 months of age or 80 to 110g in weight) are very difficult to rear successfully and should only be attempted by very experienced carers. Under three months of age the wombat joeys' body is not fully formed and they have a poorly developed immune system, however they have been successfully reared from as little as

40g in weight. Unless there are compelling reasons to attempt to rear a wombat joey less than 40g in weight, it should be euthanized.

Wombat joeys require a low lactose milk formula, such as Di-Vetelact, Biolac or Wombaroo Wombat Milk Replacer (see “[Further Information](#)”). The use of cows’ milk is not an acceptable substitute, however Wombat joeys have been successfully raised on human infant soymilk formulas. It is considered by many carers that Biolac and Di-Vetelact may be better products for new time carers, however Wombaroo gives better growth rate and hair quality than any other milk formulas. Manufacturers’ directions must be followed to ensure that the correct milk formula, concentration and amounts are fed, all of which are dependant on accurately assessing the age of the joey.

Detailed, accurate records must be maintained to assist in the diagnosis of health and husbandry issues and are a source of information for future reference. Basic records should include at least the following information;

- date
- age
- weight
- body measurements
- sex
- distinguishing marks (if any)
- parentage (if known) or location of rescue
- formula given (and at what strength)
- housing (pouches, heat source, cages etc).

Daily records should also include items such as time fed, quantity given, any change in formula or introduction of solids, frequency of urine and faecal matter, consistency of faeces, medications, supplements and behavioural notes.

The housing and temperature requirements are dependant upon the age of the joey. Pouch young should be placed in an artificial pouch made of natural fibres (such as cotton) which is then placed into a heated box or incubator. Furred young should be kept at around 28⁰C and furless young kept between 28⁰C and 30⁰C. Humidity must be provided to prevent the skin from drying out. Alternatively a water based, non toxic moisturiser can be applied to the skin of unfurred joeys.

Artificial warmth can be provided by way of electric heat pad or other appropriate means. Care should be made to ensure that no more than a third of the floor is heated to allow the joey to move to cooler areas if they become too warm. The heat source should preferably be placed on the outside of the cage to prevent the animal from coming into direct contact with it. Always check heat pads before using them to ensure that the thermostat is working correctly and that the temperature is accurate.

Air temperature and humidity should be closely monitored as over heating can be fatal and under heating may cause problems including weight loss, stress and diarrhoea. High or low levels of humidity can also compromise the joey.

An internal/external thermometer and humidity sensor must be used to monitor temperature and humidity without disturbing or stressing the animal.

Good hygiene practices are critical at all times. Bottles, teats and other utensils must be thoroughly cleaned and rinsed after every feed.

4.16 Identification

Unless distinguishing marks or features are documented in the wombats' records, it may not be easy to identify an individual animal housed with others of the same species. A permanent method of individual identification may be required. The preferred method of identification is a microchip implanted subcutaneously between the scapulae. This can be undertaken by an experienced carer or veterinarian.

4.17 Regular Health Checks

- 1) Arrangements must be made for the health of each wombat to be checked each day.
- 2) In particular, a record should be made in relation to any animal suffering from:
 - a) Obvious under-nourishment or weakness; or
 - b) Dermatitis or bare spots in fur; or
 - c) Heat stress or dehydration; or
 - d) Persistent diarrhoea or no faeces being passed; or
 - e) Injury to feet or toes; or
 - f) Unusual nasal discharge; or
 - g) Sores or open wounds; or
 - h) Broken bones, limps or other physical injury; or
 - i) Eye or ear injuries; or
 - j) Bloating.
- 3) A potential carer must be able to recognise signs of pain, distress and ill-health in a wombat and ensure that hygiene protocols are in place to restrict the spread of any disease outbreak.
- 4) If a wombat is in poor physical health, all reasonable steps must be taken to treat the condition. This will usually require the advice of a veterinarian experienced with native wildlife.

4.18 Carer and General Public Safety

Enclosures shall be constructed of such materials and be maintained in sufficiently good repair to ensure that they will contain the animals at all times and are to be safe for the animals and carers.

Its sheer weight makes a charging wombat capable of knocking over an average-sized adult, and their sharp teeth and powerful jaws can result in severe wounds. In addition, the flat, bony rump is designed to crush predators which attempt to follow a wombat into its burrow, and crush injuries to carers may occur when attempting to handle animals in confined spaces.

There is often a high level of concern shown by members of the public when they encounter an injured wombat. However, wombats are powerful animals and inexperienced people can be seriously injured if they try to handle them.

If the situation is dangerous for humans as well as the wombat (e.g. near a busy road), the wombat should be left until it is absolutely safe to approach it. People have been killed attempting to rescue wild animals and human safety must be the primary consideration at all times.

4.19 Zoonotic Diseases

Zoonotic diseases are diseases which can be transferred from animals to humans. Animals infected with zoonotic diseases do not always appear to be sick. Some of these diseases are extremely serious and potentially life-threatening, while others cause only transient, mild disease.

Zoonotic diseases recorded in wombats include;

- Sarcoptic Mange
- Ectoparasites (eg; Stickfast Fleas, ticks etc.)
- Leptospirosis
- Coccidia
- Toxoplasmosis
- Ringworm
- Salmonella
- E-coli (BS)

Carers should become familiar with the signs of infectious disease and ensure that hygiene protocols are in place to restrict the spread of any outbreak.

5. FURTHER INFORMATION

Captive Husbandry:

Wombat Husbandry Manuals and Guidelines;

<http://www.australasianzookeeping.org/Husbandry%20Manuals%20-%20Mammals.htm>

Behavioural Enrichment Guidelines;

<http://www.australasianzookeeping.org/Husbandry%20Manuals%20-%20Rearing,%20Training%20&%20Enrichment.htm#Enrichment>

Contacts:

DENR Fauna Permit Unit

1 Richmond Road,

Keswick, SA, 5035.

Phone: (08) 8124 4972

Fax: (08) 8124 4939

<http://www.environment.sa.gov.au/biodiversity/faunapermits/>

List of Suppliers:

Biolac.

(Hand Raising Formula and Equipment)

P.O. Box 93,

Bonnyrigg Plaza, New South Wales, 2177.

Ph: (02) 9823 9874

Fax: (02) 9823 9874

Email: biolac@optusnet.com.au

Web: <http://www.biolac.com.au/>

Sharpe Laboratories Pty Ltd.

(Di-Vetelact Hand Raising Formula)

12 Hope Street,

Ermington, New South Wales, 2115.

Ph: (02) 9858 5622

Fax: (02) 9858 5957

Email: admin@sharpelabs.com.au

Web: <http://www.sharpelabs.com.au/>

Wombaroo Food Products

(Hand Raising Formula and Equipment)

P.O. Box 151,

Glen Osmond, South Australia, 5064.

Ph: (08) 8391 1713

Fax: (08) 8391 1713

Email: Wombaroo@adelaide.on.net

Web: <http://www.wombaroo.com.au/>

Ridley Agriproducts Pty Ltd.
(Wombat pellets)
Level 4, 565 Bourke St,
Melbourne, Victoria, 3000.
Ph: (03) 8624 6500
Fax: (03) 8624 6506
Email: enquiries@ridley.com.au
Web: <http://www.agriproducts.com.au/>

6. DEFINITIONS

Carer:

An individual who has responsibility for the care and rehabilitation of a native animal under a rescue permit, or that has responsibility for the care of a native animal under a permit to keep.

Zoonoses:

Any disease or infection that is naturally transmissible from vertebrate animals to humans and vice-versa. They are caused by all types of agents: bacteria, parasites, fungi, viruses and unconventional agents.