

# **Standards for Exhibiting Australian Mammals in New South Wales**

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**Exhibited Animals Protection Act, 1986**

A publication of the Director General, NSW Department of Primary Industries  
(pursuant to Clause 8(1) of the Exhibited Animals Protection Regulation, 2005).

This standard was last amended on 19 April 2006.

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## **Part 1 – General**

### **Clause 1**

### **Scope of the Standards**

- 1) These standards apply to all species of terrestrial and aquatic native Australian mammals (and does not include marine mammals) displayed, or kept for display, by exhibitors authorised under the Exhibited Animals Protection Act 1986 (EAPA) and must be used in conjunction with all other relevant existing standards and NSW Department of Primary Industries policies, where appropriate, including:
  - General Standards for Exhibiting Animals in New South Wales.
- 2) An applicant may seek the Director-General's approval to any variation of the application of these Standards. Before a variation can be approved an applicant must satisfy the Director-General that the proposed variation is appropriate for the particular species involved. The Director-General if so satisfied may approve a variation in the particular circumstances.

### **Clause 2**

### **Purpose of the Standards**

- 1) The standards within this publication have been developed to maximise the welfare of animals in captivity and cover a range of areas including:
  - a) psychological and physical animal welfare;
  - b) educational value of exhibits;
  - c) public safety;
  - d) guidelines for new and existing displays; and
  - e) legal effect.
- 2) All space requirements in this document are minimum requirements. Exhibitors are encouraged to make enclosures larger than those listed in order to further increase the animal welfare benefit to the animals being held.

#### **Note**

All material found within the document in a box such as this one, is for information only.

## **Part 2 - Housing**

### **Clause 3**

### **Platypus**

- 1) The captive environment must provide:
  - a) for natural foraging behaviour through provision of live invertebrate food items;

- b) secure ledges or banks for protected feeding, resting and grooming;
- c) a variety of natural objects such as logs, rocks, soil and plants;
- d) a large water body with adequate water flow and/or filtration to maintain quality;
- e) a water body with a surface area of at least 6m<sup>2</sup> and a depth of at least 0.4m;
- f) water temperatures and air temperatures in nest boxes similar to those experienced in the wild (less than 25°C);
- g) tunnel systems modelled on wild tunnels, e.g. with respect to length and internal dimensions, to join the feed tanks, nest boxes and displays; and
- h) nests containing clean and dry nesting material.

**Note**

Nesting materials such as sphagnum moss and sea grass have been used with success.

- 2) The aquatic environment must be maintained to a high standard of water clarity and cleanliness, with the tank water being changed frequently if recirculating filtration is not incorporated into the system. Filter inlets must be shielded to prevent platypus becoming trapped. All endeavours must be made to minimise the presence of electrical currents, excessive noise and vibration.

**Note**

Electrical current can be associated with pumps and filtering equipment.

- 3) Tunnels provided for platypus must:
- a) be at least 6 cm high and 9 cm wide internally;
  - b) be constructed of materials, such as wood or plastic, that minimise abrasion to feet, bill and fur while providing traction underfoot.

**Note**

Care needs to be taken to ensure the wood does not have splinters or that the wood or plastic is not slippery. If required short pile weatherproof carpet can be used.

- c) not incorporate slope angles greater than 30°;
- d) enable water brought into tunnels by the platypus to escape through drainage holes and/or evaporation;
- e) have interiors that are accessible via secure lids/hatches for inspection or cleaning purposes;
- f) be rainproof (if located outdoors);

- g) be sufficiently well shaded and/or insulated so that interiors do not exceed ambient air temperatures on sunny days (must not exceed 25°C); and
  - h) be fitted with sliding internal doors (or comparable device) so the tunnel can be closed or diverted if required.
- 4) Adult males must not be held in the same enclosure due to their tendency to fight. If a male and female(s) are held together they must be given at least two pools, and adequate burrows and land area to avoid each other if they choose.
  - 5) If two animals are held together they must be provided with nest boxes and tunnels that have multiple entry points to allow individuals to escape from unwanted attention/aggression.

#### **Clause 4**

#### **Echidnas**

- 1) If a concrete floor is not used then the external walls must be submerged to a depth of at least 50cm.

**Note**

Exhibits for echidnas must be well built as their very strong forelimbs can allow them to pull apart wire and other materials if not well constructed.

- 2) Concrete floors can only be used if they are covered with a substrate such as soil, leaf litter or mulch to a depth of at least 40cm and ideally over 60cm.
- 3) Walls must be at least 90cm high and constructed so that echidnas cannot climb out.

**Note**

Care needs to be taken with overhanging shrubs or small trees as echidnas are excellent climbers.

- 4) Wire mesh fence construction is not permitted as echidnas are prone to cut their noses when trying to push through such fences.

#### **Clause 5**

#### **Carnivorous Marsupials**

- 1) Carnivorous marsupials must be contained in fully enclosed displays or facilities with solid smooth unclimbable partitions of a height that prevents escape.

**Note**

Openings in wire mesh should be narrow enough to prevent an animal pushing its head through.

- 2) Mature Tasmanian devils may be contained in open enclosures. Fences for open enclosures must be at least 1.2m high and be constructed of smooth material to stop animals climbing out. An inward horizontal or slanted overhang (at least 30cm wide) or stand off barrier must also be provided to minimise the likelihood of members of the public coming in contact with the Tasmanian devils.

- 3) Large carnivorous marsupials such as spotted-tailed quolls and Tasmanian devils must have a double door entry into the enclosure to minimise the risk of escape.

**Note**

Tin strips, 0.3-0.5m wide, added to the top of enclosure walls at an angle of 45° have also been used with success in keeping in eastern quolls.

- 4) In open exhibits, vegetation or exhibit furniture must not be placed near or be allowed to grow over the enclosure boundary as this can provide escape opportunities.
- 5) Tasmanian devil enclosures with soil floors must have wire mesh buried a minimum of 50cm below the soil surface. This may not be needed if the footings to the outside of the exhibit go down at least 50cm and in at a right angle of 30cm.
- 6) Basking opportunities must be provided for all species of dasyurids in the form of direct access to the sun (especially for quolls and Tasmanian devils) or with the use of heat lamps or heat mats (eg. for small species).

**Note**

Access to natural sunlight is recommended as it is not known whether artificial lights provide sufficient substitute. Natural light cycles appear to be important in the successful breeding of many species of dasyurids.

**Clause 6**

**Numbat**

- 1) Numbats are very good climbers so they must be contained in fully enclosed displays or facilities with solid smooth unclimbable partitions of a height that prevents escape.
- 2) Shrubs, tussocks, rocks, hollow logs and suitable nesting material must be provided for shelter.

**Note**

Hollow logs with entrance dimensions of approximately 70 x 80mm to 70 x 120mm are used by numbats as refuges, so the provision of a number of these logs is very important. Nests are used by both sexes and are made from finely shredded bark, grass, and eucalypt leaves and can be found in both hollow logs and burrows.

- 3) The aspect of the enclosure must allow numbats the opportunity to sun bake during the majority of the daylight hours.

**Note**

The position of the enclosure appears to be important as sun basking appears to be an essential feature of the thermoregulation of numbats.

**Note**

To increase activity 70% shade cloth can be added over half of the enclosure, as numbats normally become inactive when the temperature exceeds 30°C.

Heat lamps may also be provided. Generally numbats appear to prefer hotter drier climates and do not tolerate cold wet climates.

- 4) The substrate must contain sufficient soft soil to allow the numbats to dig burrows (ideally heavy sand or light clay in which roots of trees and shrubs provide some structure) extending 0.5m below the surface. The soil must also be well drained and stable enough that it does not collapse.

**Note**

Encouraging animals to use nest boxes may be preferred as this allows the animals to be more easily accessed and reduces the chance of deaths as a result of tunnels collapsing.

- 5) A nest box for each individual must be supplied, with dimensions of 12 x 12 x 75cm and an entrance hole of 60cm in diameter at one end.

**Clause 7**

**Bandicoots**

- 1) A layer of soil, sand, leaf litter and/or mulch to a depth of at least 10cm must be provided so the bandicoots can dig a nest depression in which to nest.
- 2) Bandicoot enclosures must include tussocks, hollow logs and branches.

**Note**

Bandicoots frequently make their nests at the base of tussocks, hollows logs and branches. Caution should be taken with old dry browse as the sharp ends may cause injuries to the eyes.

- 3) Enclosure walls must be unclimbable for bandicoots to a height of at least 1.2m.

**Note**

Some bandicoots, such as the eastern barred bandicoot, can jump and/or climb mesh which can result in injuries to their snout and feet.

The use of closely woven shade-cloth over mesh has also been used successfully to prevent climbing.

- 4) The enclosure must allow all enclosed bandicoots to shelter from the prevailing weather conditions, including rain and wind.

**Clause 8**

**Koala**

1) General Requirements

a) Construction

- i) Enclosures, or the perimeter fence in the case of an establishment where koalas are permitted to free range, must be designed in such a way as to prevent the entry of wild koalas. This requirement only applies to establishments located in areas where wild koalas are known to occur.

- ii) Enclosures may be of open, semi-enclosed or totally enclosed design.
- iii) Sufficient shelter must be provided to allow protection from wind, rain and extremes in temperature and allow sufficient access to shade during the hot periods of the day.
- iv) The size and shape of enclosures for koalas must provide freedom of movement, both vertically and horizontally.
- v) The enclosure must be well drained and have either a readily cleanable substrate or be of a material that can be replaced to avoid the accumulation of faeces and urine.
- vi) Concrete floors, due to their lack of naturalism, are unacceptable for exhibits, unless overlaid with well drained natural substrate such as coarse sand, leaf litter or gravel.

#### b) Isolation Facilities

Suitable isolation facilities must be provided for quarantine of incoming or sick animals.

#### c) Protection from Noise, Harassment and Stress

Each operator exhibiting koalas to the public must:

- i) provide a sufficient number of experienced, identifiable staff in attendance at any session allowing visitors to interact with koalas to protect the koalas from abuse and harassment where koala interaction occurs and to ensure that undue stress on the koalas does not occur;
- ii) ensure that koalas are not placed directly on any visitor or directly held by any visitor for any purpose. Interaction of koalas by members of the public must be restricted to patting, stroking and cuddling to the extent of putting an arm around the koala while the animal remains on a fixed perch; and
- iii) ensure that the koalas are not repeatedly removed from objects to which they are clinging.

#### d) Enclosure Furniture

- i) There must be at least two tree forks per koala not less than 1.8 metres above ground and not closer than 0.9 metres to the next fork.
- ii) All supports and branches must provide sufficient traction for koalas to climb easily and safely.
- iii) Enclosure substrate for exhibits must include sufficient ground layer vegetation to provide a naturalistic setting.



## 2) Hygiene

Substrate of enclosures must be cleaned daily unless the enclosure is large enough that the natural rate of faecal decay is enough to inhibit accumulation of faecal material. The supports and branches must be replaced as necessary and be maintained in a clean and hygienic condition, free from the accumulation of faeces and urine.

## 3) Records

### a) Identification

Each koala must be individually identified by an approved method of identification. The only approved method of identification is Trovan compatible Passive Integrated Transponder (PIT) tags. Additional methods may be used in addition to PIT tags.

### b) Record-Keeping

- i) Establishments must keep records of all koalas on an individual basis in a form that can be quickly and easily examined, analysed and compared with those kept by other establishments.
- ii) All documents and other information pertaining to each animal, including records from previous locations, must be kept safely. Animals moving to new locations must be accompanied by copies of all records relevant to those animals.
- iii) The records must provide for each koala at least the following information:
  - the correct identification number, scientific name, any personal name and any distinctive markings;
  - the origin (i.e. details of the wild population or of the parents and their origin, and of any previous location);
  - the dates of acquisition and disposal, with details of circumstances and addresses;
  - the date or estimated date of birth, and the basis on which the date is estimated, or the date of the first emergence of the juvenile from the pouch;

**Note**

The date of birth can be estimated from growth curves shown in Bach (1998) and Jackson (2003).

- weight on arrival, and thereafter monthly. The requirement for weighing animals monthly does not apply to koalas that are either free-ranging within the perimeter barrier of the establishment, or are not dependent on hand-feeding for nourishment;

- clinical data, including results of physical examination by a qualified veterinarian, and details of and date when any form of treatment was given, together with results of routine health examinations;
  - breeding and details of any offspring; and
  - the date of death and the results of the post mortem reports which must be performed by a qualified veterinarian.
- iv) The Director-General may require records of daily leaf collections to be maintained, including details of:
- leaf species;
  - area of collection; and
  - weights of leaves before and after feeding.
- v) Records may be required to be submitted to the Director-General at three monthly intervals for a period of two years from the date of initial issue of a permit to exhibit koalas.

#### 4) Diet and Food Collection

##### a) General

- i) An establishment applying for a permit to exhibit koalas must satisfy the Director-General that it has guaranteed access to adequate fresh supplies of leaves from at least three suitable koala food tree species. This is important when particular species can be susceptible to insect attack at particular times of the year. Known food trees include the species listed below:

<i>Eucalyptus botryoides</i>	Southern Mahogany
<i>Eucalyptus camaldulensis</i>	River Red Gum
<i>Eucalyptus camphora</i>	Broad-leafed Sally
<i>Eucalyptus citriodora</i>	Lemon-scented Gum
<i>Eucalyptus cypellocarpa</i>	Mountain Grey Gum
<i>Eucalyptus globulus</i>	Tasmanian Blue Gum
<i>Eucalyptus goniocalyx</i>	Long-leafed Box
<i>Eucalyptus grandis</i>	Flooded Gum
<i>Eucalyptus haemastoma</i>	Scribbly Gum
<i>Eucalyptus maculata</i>	Spotted Gum
<i>Eucalyptus microcorys</i>	Tallowwood
<i>Eucalyptus nicholii</i>	Small-leafed Peppermint
<i>Eucalyptus obliqua</i>	Messmate
<i>Eucalyptus ovata</i>	Swamp Gum
<i>Eucalyptus paniculata</i>	Grey Ironbark
<i>Eucalyptus pilularis</i>	Blackbutt
<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum
<i>Eucalyptus punctata</i>	Large-fruited Grey Gum

<i>Eucalyptus radiata</i>	Narrow-leafed Peppermint
<i>Eucalyptus robusta</i>	Small Mahogany
<i>Eucalyptus rubida</i>	Candle Bark
<i>Eucalyptus saligna</i>	Sydney Blue Gum
<i>Eucalyptus scoparia</i>	Wallengarra White Gum
<i>Eucalyptus sideroxylon</i>	Red Iron Bark
<i>Eucalyptus tereticornis</i>	Forest Red Gum
<i>Eucalyptus viminalis</i>	Manna Gum

- ii) A sufficient quantity of eucalypt leaves must be provided continuously and replaced at least once daily.
- iii) Keeping staff must be able to recognise the above species of eucalypts within their region and/or plantation in order to provide adequate food of the correct species.
- iv) The Director-General may require a plantation of suitable *Eucalyptus* species to be established to ensure the supply of food for koalas. In these plantations 1000 trees are required to be planted for each koala.

**Note**

The requirement for eucalypt plantations, the need for 1000 trees per koala and eucalypt plantation guidelines is outlined in Jackson (2003) and Knight (2004).

- v) Preferred species of eucalypt must be supplemented by a variety of different species of eucalypt as a precaution against local or seasonal differences in digestibility and palatability of dietary leaf matter. Both young and mature leaves must be provided.
- vi) Feed must be presented as close and accessible to the koalas perch as possible and care taken to prevent wastage of feed that is placed out of reach
- vii) Fresh soil must be provided, but not around the base of perches, to provide for supplementation of mineral intake or alternatively a mineral salt lick be provided.
- viii) Clean accessible drinking water facilities must be provided. Water must be replaced at least once daily.

b) Quality of Food Leaves

Frequency of leaf cutting and the operation of leaf storage facilities must ensure the koalas receive palatable, uncontaminated, nutritionally adequate food leaves.

5) Transport

a) Quarantine

Koalas to be transferred between establishments must be subject to a period of 30 days quarantine at either the importing or exporting establishment unless an exemption from the quarantine period is advised and certified by a veterinarian following a

complete veterinary examination. The certificate must also establish that the koala is:

- i) not in a weakened or emaciated condition; and
- ii) is free from signs of clinical disease of:
  - keratoconjunctivitis,
  - pneumonia,
  - dermatitis, and
  - urogenital discharge,

#### b) Transport Cage

Koalas must be transported individually in solid framed cages measuring at least 95cm x 75cm x 95cm high. The cages must have removable, leak proof metal drop trays fitted at the base. Sides and top must be of stout wire mesh and be fitted with light hessian or shade cloth covers. Each cage must be fitted with a resting branch providing at least two forks.

#### c) Feeding in Transit

- i) Koalas must each be accompanied by at least 3.6kg of the leaves on which they are normally fed; the leaves being left on the stem and the base of the stem remaining in water or sealed.
- ii) One kilogram of these leaves must be placed in the cage with the koala before departure.

#### d) Stress Reduction

- i) Koalas must not be subjected to temperatures greater than 30°C or less than 10°C during the trip.
- ii) Koalas must be accompanied by a keeper familiar with the animals being transported, except during air transport.
- iii) Noise must be minimised during transport.
- iv) Time from caging for transport to destination arrival must be minimised.

### **Clause 9**

### **Wombats**

- 1) The exhibit structure for wombats needs to be strongly made as they are highly destructive due to their very powerful build and digging habits.
- 2) Treated timber must not be used in the construction of the exhibit as wombats may chew these materials.
- 3) The floor must be composed of soil with a mesh underlay or concrete layer to prevent them from escaping under the fence.

- 4) The surrounding wall must be a minimum of 1.2m high. Suitable fencing techniques can include smooth surfaces, cyclone wire, brick and pool fencing. Submissions can be made to the Director General for lower enclosure fence heights (down to 0.9m) depending on the methods used on the top of the fence.
- 5) In any display where wombats cannot construct burrows, appropriate measures must be taken to provide them with adequate shelter so that they can behaviourally thermoregulate and feel secure. This shelter can be either in the form of mock rock burrows, camouflaged concrete pipes or hollow tree trunks and overstorey planting.
- 6) Where natural burrows are allowed to be constructed, the substrate must be composed of adequate clay material to minimise the occurrence of burrow collapse.
- 7) Adequate shading during warm weather (ie >25°C) must always be provided.

**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.

**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°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°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 to retreat to during hot weather, which can be achieved by using sprinklers and adequate shading.

- 8) Wombats must be maintained on a high fibre, low crude protein diet. Dry dog food must not be offered.

**Note**

If the wombats do not have free access to natural forage they should be provided with freshly cut grass and hay should be provided every day and items such as rolled oats, sweet potato, apple, carrots and corn on the cob should only be offered in small quantities.

**Clause 10**

**Possums and Gliders**

- 1) Enclosures must contain visual barriers. This must include living or freshly cut foliage of native species of plants.
- 2) A variety of appropriately sized nest boxes and/or tree hollows must be provided to offer a refuge for the animals and allow them to nest away from other aggressive individuals. If held out doors nest boxes and tree hollows must be placed in a position of the enclosure where they are protected from inclement weather.

**Note**

Behavioural enrichment should be provided in the form of flowers, foliage and branches (eg stringybark) of native species to provide additional food and nesting material.

- 3) Adequate climbing and gliding opportunities must be provided.
- 4) Some species such as *Petaurus* gliders, Leadbeater's possum and honey possums generally live in family groups, or in the case of feathertail gliders, in large extended groups, so this social structure must be provided for.

**Clause 11****Macropods**

## 1) Facilities

## a) Construction

- i) Unless temporary holding yards can be constructed, all macropod enclosures must incorporate an adjoining holding yard(s). A number of display enclosures may make use of the same holding yard. The size of holding yards must not fall below one third of the minimum requirements for display enclosures.
- ii) The enclosure must be well drained and the substrate predominantly of compacted inert material, which is non-abrasive to macropod feet. Concrete is only acceptable for short term holding/hospital enclosures.

## b) Fences

- i) Establishments exhibiting macropods must have a dog and fox-proof perimeter fence.

**Note**

A fence that has a vertical mesh face at least 2m above the ground, with 0.5m beneath ground and 0.5m overhanging outwards at 45 degrees above horizontal complies with this requirement. Other alternative fence designs may comply. Fences without the 45-degree overhang may be approved if they incorporate appropriately fitted operational electric hotwires or are constructed from smooth unclimbable panels.

- ii) Enclosure fence heights may be less than 2m high if the perimeter fence is predator proof.
- iii) If climbing species (musky rat kangaroo, rock wallabies, tree kangaroos and bettongs) are to be enclosed by unroofed fences, then the fences must be made of a material which is not climbable or rimmed by 45 degree overhang that is 0.5m wide facing into the enclosure.
- iv) Fences must not incorporate obstacles protruding out from the fence line (including poles supporting the fence) into the enclosure.
- v) Straining wires for fences must be on the outside of the enclosure.

- vi) Changes in the direction of fence lines must be as smooth as possible. Any fence angle change must be clearly visible to the macropods. Where there is dense planting behind changes in the angle of wire mesh fences, the fence must be of more visible construction. Bushes may be planted inside the enclosure, or loosely fitted wire mesh may be placed across corners to reduce the impact of a macropod encountering sharply angled corners.
- vii) Mesh size of wire fences must be sufficiently small to ensure that the enclosed macropods cannot get their heads caught.

**Note**

Deer fencing is not considered adequate as the macropods can get their head caught in the fencing if they run into it.

c) Enclosure Furniture

- i) Enclosure furniture and fittings must be of such style and position as to prevent the likelihood of injury and, in particular, must not be placed so as to provide an obstacle which will injure a macropod running a fence line.
- ii) Suitable ground cover and/or other sight barriers must be provided so that individuals can isolate themselves visually from the viewing public and other macropods sharing the enclosure.
- iii) Ground cover must be arranged so as to provide numerous pathways and hiding loci, which serve to prevent stereotypic behaviour.
- iv) Shelter: All animals must be provided with a means of sheltering from wind, rain and extremes of temperature and sunlight. (This requirement may be fulfilled by providing a combination of ground cover and external plantings.)
- v) There must be sufficient soft substrate/bedding to allow all macropods to create a 'hip-hole' for comfortable resting.
- vi) Without limiting the generality of (b), suitable ground cover for the following macropod species includes:

Musky rat-kangaroo, bettongs, hare wallabies, nailtails wallabies, dorcopsis wallabies, pademelons, quokka	Rocks, grass tussocks, low plants/bushes, small shade trees, solid and hollow logs, dried grass, leaves to make nests, soil deep enough for burrowing species to make warrens
Rock wallabies, wallaroos	Large rocks forming a rock knoll, rock crevices, caves, overhangs, low growing shrubs/bushes, small shade trees.
Tree kangaroos	Thick vegetation on easily climbed branches, elevated hollow logs/boxes.

Other species	Shade trees - add smaller trees, bushes for eastern grey kangaroos.
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- vii) Enclosures for tree kangaroos must include trees that they can climb or rough-barked naturalistic climbing structures. (These may also be provided for musky rat kangaroos and rock wallabies.)

There must be 15 lineal metres of climbing structure/tree for each tree kangaroo. Tree kangaroos must be able to attain height of at least 2.5m. Enclosure boundaries must be sufficiently distant from trees and climbing structures to prevent tree kangaroos from jumping out.

The requirement for naturalistic climbing structures must be met by providing a selection of stout, forked branches, low vertical logs and inclined branches to ensure a variety of arboreal pathways.

## 2) Compatibility

- a) Macropod species noted for interspecific aggression must not be held together in the same enclosure.
- b) If an individual macropod is being continually stressed by the aggression of other animals in the enclosure, it must be removed from that enclosure.
- c) An additional 25% of the area listed in Clause 15 must be added to the enclosure size for each extra adult female.
- d) An additional 50% of the area listed in Clause 15 must be added to the enclosure size for each extra adult male.
- e) Where visitors are permitted to go into an enclosure with macropods, there must be an area, which at least meets the minimum size requirements for holding yards and which is designated off limits to the visitors so the enclosed macropods may escape unwanted visitor attention.

## 3) Nutrition

- a) There must be food available in addition to the vegetation growing in the enclosure.
- b) Omnivorous species (potoroos, bettongs and musky rat-kangaroo) must be provided with the opportunity to obtain animal-based food appropriate to the species in addition to vegetation-based food.
- c) Food must be placed above the substrate in suitable food containers. The enclosure must have facilities for placing the food containers under shelter to ensure the provision of unspoiled food.
- d) The number of feeders and waterers and the available space at feeders and waterers must be sufficient to ensure easy access to food and water by each individual. Food must be available to tree kangaroos at or above ground level.



- e) Suitable fibrous material must be a component of macropod diet except for those omnivorous species, which do not require it (potoroos, bettongs).
  - f) Dry food containers (pellets) must be kept clean, dry and free from pellet dust accumulation.
- 4) Transport
- a) Material for Container
    - i) For transport trips of less than 24 hours duration, macropods must, wherever possible, be transported in suspended bags made of hessian or similar open-weave material.
    - ii) Where this is not possible, or for transport trips greater than 24 hours duration, the macropods must be transported in a container constructed from fibreboard, hardboard, wood/plywood, or other appropriate material to the design requirements of 4b below.
  - b) Design
    - i) Framework must be 20mm x 20mm light timber for macropods weighing less than 20kg.  
  
Framework must be of 25mm x 25mm light timber for macropods weighing more than 20kg.  
  
Macropod transport containers must not have internal framing.
    - ii) Bottom and fixed sides must be of 6mm (13mm for macropods weighing more than 20kg) plywood glued and screwed. Macropod transport containers must not have slatted floors.
    - iii) The end is to be closed by a sliding door of 6mm (13mm for macropods weighing more than 20kg) plywood which, once in place, must be secured by screws at each end.
    - iv) The ceiling must not be solid. It must consist of flexible chicken wire mesh, padded on the underside with hessian to protect the animal's head should the animal become agitated and jump.
    - v) The container must be large enough for the animals to turn around, to lie and to stand comfortably. Dimensions must not exceed these criteria as no room for exercise is needed and animals may hurt themselves if too much room is provided.
    - vi) A transport container for macropods must not allow the entry of light, except through ventilation holes. The ventilation holes must be 5cm below the internal roof height and 5cm above absorbent material used on the floor of the container to prevent spillage. The ventilation holes of 15mm diameter must be pierced at no

greater than 10cm centres at the top and bottom of each side.

vii) Spacing blocks of 2.5cm must be fixed to the outside of the box on all four sides.

#### c) Sedation

All macropods must be appropriately sedated under the supervision of a registered veterinarian before being enclosed in transport containers.

#### 5) Public Safety

Adult males of large macropod species and adult wallaroos of either sex or any other animals that are aggressive to humans must not be enclosed in walk-through enclosures.

#### **Note**

Due to concerns over finding new homes for the large species of macropods in the event of the closure of a park, it is recommended that no more than 50 individuals of the large species of macropods be held at any one time.

#### **Clause 12**

#### **Bats**

- 1) Natural light must be provided for flying foxes as they are very active during the day and have excellent sight.
- 2) Flying foxes must be given opportunities to bask in the sun. They must also be provided with adequate shading, which can be achieved with shade cloth or vegetation.
- 3) Adequate climbing opportunities must be provided for all bats.

#### **Note**

Climbing opportunities can be in the form of the wire cage itself if held outdoors and/or, in the case of megachiropterans, provided by establishing an extensive network of branches, natural or artificial vines, vinyl coated wire (2.5cm diameter) hung from the ceiling, or thick rope (though this is difficult to clean). Care should be taken with branches and other climbing apparatus to make sure that the animals still have room to fly and that the branches are not sharp enough to cause wing tears. All climbing apparatus should extend to the ground as all bats fall to the ground on occasion. This allows them to easily climb back up to the roof or higher areas of the enclosure.

- 4) The enclosure walls and roosting areas must be non-abrasive to avoid injury, ideally sealed and able to withstand regular cleaning.
- 5) Flying-foxes must not be held as solitary animals due to their social nature.
- 6) Flying-foxes must be provided with enough room to fully stretch both wings and be able to make short flights.
- 7) Each bat exhibit must be provided with multiple feed stations, which must be appropriately spread throughout the exhibit due to the aggressive behaviour shown between bats over food.

- 8) The viewing area can be made of glass or have a stand off barrier if viewing through wire. Walk through enclosures are not advised due to the potential transmission of the zoonotic Australian Bat Lyssavirus, which is known to be fatal to humans.
- 9) All staff involved with handling bats of any species must be vaccinated against the Australian Bat Lyssavirus with the rabies vaccine.

### **Clause 13**

### **Rodents**

- 1) The enclosure needs to be constructed of non-chewable material such as tin or metal.
- 2) Crevices, small holes or hollows that a keeper cannot access must be avoided.
- 3) Arboreal species such as tree rats, fawn-footed melomys and prehensile-tailed rats must be given usable vertical space (1.5 to 2.0m high) by the provision of branches to climb.
- 4) Stick-nest rats must be given branches for the building of stick nests, which provide significant behavioural enrichment.
- 5) Loose pebbles must also be provided for pebble mound mice.

#### **Note**

Desert rodents (such as most of the hopping mice, some *Pseudomys* and some rock rats) can readily be held in displays with a substrate of sand and rocks with grass tussocks. The rock rats prefer to move over quiet substrates and will avoid dried leaf litter in favour of rocks so this should be included within the exhibit design. Some species such as long-haired rats and *Pseudomys* have well developed underground tunnels in the wild so displays could make use of this and represent a cut away version of a tunnel system in their display.

- 6) Water rats must be provided with a pool of water at least 2m<sup>2</sup> x 50cm deep for swimming, so they can utilise their significant swimming skills, which they display during foraging and play.
- 7) All rodents must be given the opportunity to chew/gnaw firm objects such as branches and nuts to maintain healthy teeth.

#### **Note**

Nesting areas should ideally be provided for all small species of rodents to allow them somewhere to retreat to sleep, raise young and feed. Although nest boxes can be provided, other less elaborate apparatus can be used, especially for the smaller species, including plastic or thick cardboard tubes, hollow logs, pieces of bark, cardboard boxes and shredded paper. If plastic tubes are used, ensure they are of a large enough diameter to allow airflow or perforate them with small holes. Obviously artificial items should be reserved for off-exhibit areas.

### **Clause 14**

### **Dingo**

- 1) Exhibit Construction
  - a) The exhibit must provide structural complexity. This must include:

- i) climbing opportunities such as large rocks and large horizontal trees; and
  - ii) undulations in soil topography; and
  - iii) vegetation such as trees, grass and shrubs.
- b) Moats can be used with the following minimum requirements:
- i) wall extends at least one metre above water surface; and
  - ii) water depth must not allow dingoes to stand at the base of the wall; and
  - iii) moat width must be at least 1.8m.
- c) Fence height must be at least 2.5 metres with an additional inhang of at least 0.5m that is at an angle of 35-45°.
- d) An adjoining holding yard of at least 25m<sup>2</sup> must be provided for up to four animals.

**Note**

Ideally if more than two animals are held the holding yard should be divided into two to allow adequate separation of animals during feeding.

2) Social behaviour

- a) Dingoes can be held in pairs or family groups.
- b) Dingoes must not be held by themselves, except during treatment or while another animal is being sought.
- c) Opportunities must be provided to allow subordinate dingoes to retreat from aggression of more dominant dingoes.

**Clause 15**

**Spatial requirements**

- 1) Australian mammals must be provided with enclosures no smaller than those listed in Table 1. As a general rule the lengths and hence enclosure sizes are based on a ratio of the typical body size of the genus and their general mobility.
- 2) The minimum enclosure size for a long-term holding enclosure for a species is the same as the minimum exhibit size for that species.
- 3) Where an enclosure contains more than one species, the minimum enclosure area is the sum of the minimum areas that would otherwise be required for each species.

**Table 1. Minimum enclosure sizes required for up to two animals of each genus of Australian mammals.**

Genus	Common Name	Head-Body Length (cm) <sup>1</sup>	Total Length (cm)	Minimum Enclosure Area (m <sup>2</sup> )	Minimum Enclosure Height (cm)	Additional Floor Area for Each Extra Animal (m)
<b>Platypus</b>						
<i>Ornithorhynchus</i>	Platypus	36	50	6.00 (water)	100	2.00 x 2.00
<b>Echidna</b>						
<i>Tachyglossus</i>	Echidna	40	40	16.00	90	2.00 x 2.00
<b>Carnivorous Marsupials</b>						
<i>Dasyercus</i>	Mulgara	17	35	4.00	60	0.40 x 0.40
<i>Dasykaluta</i>	Dasykaluta	11	18	0.25	40	0.20 x 0.20
<i>Dasyuroides</i>	Kowari	17	48	8.00	60	0.40 x 0.40
<i>Dasyurus - Small</i>	Northern Quoll	30	60	15.00	240	2.00 x 2.00
<i>Dasyurus – Medium</i>	Eastern/Western Quoll	45	80	20.00	240	2.50 x 2.50
<i>Dasyurus – Large</i>	Spotted-tailed Quoll	75	130	30.00	240	3.00 x 3.00
<i>Parantechinus</i>	Dibbler	12	24	2.25	50	0.25 x 0.25
<i>Pseudantechinus</i>	Antechinus	10	18	0.25	40	0.20 x 0.20
<i>Sarcophilus</i>	Tasmanian Devil	65	90	30.00	120	3.00 x 3.00
<i>Antechinus</i>	Antechinus	14	26	0.25	30	0.25 x 0.25
<i>Phascogale</i>	Phascogale	22	45	9.00	200	1.00 x 1.00
<i>Planigale</i>	Planigale	10	18	0.25	40	0.25 x 0.25
<i>Ningau</i>	Ningau	7	14	0.25	40	0.25 x 0.25
<i>Antechinomys</i>	Kultarr	9	21	0.25	40	0.25 x 0.25
<i>Sminthopsis</i>	Dunnart	13	25	0.25	40	0.25 x 0.25
<i>Notoryctes</i>	Marsupial Mole	16	18	1.00	100	0.50 x 0.50
<b>Numbat</b>						
<i>Myrmecobius</i>	Numbat	25	44	15.00	200	1.50 x 1.50
<b>Bandicoots</b>						
<i>Isodon</i>	Bandicoot	40	60	16.00	200	2.50 x 2.50
<i>Perameles</i>	Bandicoot	35	165	16.00	200	2.50 x 2.50
<i>Macrotis</i>	Bilby	55	82	25.00	200	3.00 x 3.00
<i>Echymipera</i>	Rufous Spiny Bandicoot	40	50	16.00	200	2.50 x 2.50
<b>Koala</b>						
<i>Phascolarctos</i> <sup>2</sup>	Koala	78	78	12.00	240	2.00 x 2.00
<b>Wombats</b>						
<i>Lasiornhinus</i>	Hairy-nosed Wombat	100	103	45.00	120	3.00 x 3.00
<i>Vombatus</i>	Common Wombat	100	105	45.00	120	3.00 x 3.00
<b>Possums and Gliders</b>						
<i>Burramys</i>	Mountain Pygmy Possum	11	25	1.00	100	0.3 x 0.3
<i>Cercartetus</i>	Pygmy possum	11	25	1.00	100	0.3 x 0.3

Genus	Common Name	Head-Body Length (cm) <sup>1</sup>	Total Length (cm)	Minimum Enclosure Area (m <sup>2</sup> )	Minimum Enclosure Height (cm)	Additional Floor Area for Each Extra Animal (m)
<i>Dactylopsila</i>	Striped Possum	26	59	9.00	300	2.0 x 2.0
<i>Gymnobelideus</i>	Leadbeater's Possum	16	33	8.00	300	2.0 x 2.0
<i>Petaurus</i> - small	Sugar Glider	17	36	8.00	300	1.0 x 1.0
<i>Petaurus</i> - medium	Squirrel/Mahogany Glider	25	60	10.00	300	1.5 x 1.5
<i>Petaurus</i> - large	Yellow-bellied Glider	28	72	12.00	300	2.0 x 2.0
<i>Hemibelideus</i>	Lemuroid Ringtail Possum	34	68	8.00	300	2.0 x 2.0
<i>Petauroides</i>	Greater Glider	45	95	8.00	300	2.0 x 2.0
<i>Petroseudes</i>	Rock-ringtail Possum	38	62	8.00	300	2.0 x 2.0
<i>Pseudocheirus</i>	Ringtail Possum	40	80	8.00	300	2.0 x 2.0
<i>Pseudochirops</i>	Green Ringtail	34	67	8.00	300	2.0 x 2.0
<i>Pseudochirulus</i>	Ringtail Possum	40	76	8.00	300	2.0 x 2.0
<i>Tarsipes</i>	Honey Possum	9	19	1.00	100	0.3 x 0.3
<i>Acrobates</i>	Feathertail Glider	8	16	1.00	100	0.3 x 0.3
<i>Spilocuscus</i>	Spotted Cuscus	58	101	12.25	300	2.0 x 2.0
<i>Phalanger</i>	Cuscus	40	75	12.25	300	2.0 x 2.0
<i>Trichosurus</i>	Brushtail Possum	55	95	12.25	300	2.0 x 2.0
<i>Wyulda</i>	Scaly-tailed Possum	40	70	12.25	300	2.0 x 2.0
<b>Macropods</b>						
<i>Hypsiprymnodon</i>	Musky Rat-kangaroo	27	43	15.00	200	2.25 x 2.25
<i>Aepyprymus</i>	Rufous Bettong	39	77	15.00	200	2.25 x 2.25
<i>Bettongia</i>	Bettong	40	74	15.00	200	2.25 x 2.25
<i>Potorous</i>	Potoroo	41	74	15.00	200	2.25 x 2.25
<i>Dendrolagus</i>	Tree Kangaroo	75	155	40.00	200	3.20 x 3.20
<i>Dorcopsis</i>	Forest Wallabies	70	40	60.00	200	4.50 x 4.50
<i>Lagorchestes</i>	Hare-wallaby	47	96	20.00	200	3.20 x 3.20
<i>Lagostrophus</i>	Banded Hare Wallaby	45	85	20.00	200	3.20 x 3.20
<i>Macropus</i> – small <sup>3</sup>	Wallaby	70	125	30.00	200	3.20 x 3.20
<i>Macropus</i> – medium <sup>4</sup>	Wallaby	90	170	60.00	200	4.50 x 4.50
<i>Macropus</i> – large <sup>5</sup>	Kangaroo	120	220	250.00	200	5.50 x 5.50
<i>Onychogalea</i>	Nailtail Wallaby	70	133	40.00	200	3.20 x 3.20
<i>Peradorcas</i>	Rock-wallaby	32	65	40.00	200	3.20 x 3.20
<i>Petrogale</i>	Rock-wallaby	64	126	40.00	200	3.20 x 3.20
<i>Setonix</i>	Quokka	54	84	30.00	200	3.20 x 3.20
<i>Thylogale</i>	Pademelon	60	108	40.00	200	3.20 x 3.20
<i>Wallabia</i>	Swamp Wallaby	84	170	60.00	200	4.50 x 4.50
<b>Bats</b>						
<i>Macroglossus</i>	Blossom-bat	6	6	4.00	240	1.00 x 1.00
<i>Syconycteris</i>	Blossom-bat	6	6	4.00	240	1.00 x 1.00
<i>Nyctimene</i>	Tube-nosed Bat	10	12	9.00	240	1.50 x 1.50
<i>Dobsonia</i>	Bare-backed Flying Fox	30	33	15.00	300	1.50 x 1.50
<i>Pteropus</i>	Flying-fox	29	29	15.00	300	1.50 x 1.50
<i>Macroderma</i>	Ghost Bat	13	13	9.00	240	1.50 x 1.50
<i>Rhinolophidae</i>	Horseshoe-bat	6	10	1.00	150	0.50 x 0.50
<i>Hipposideridae</i>	Leafnosed-bat	8	12	1.00	150	0.50 x 0.50
<i>Emballonuridae</i>	Sheath-tail-bat	10	14	1.00	150	0.50 x 0.50
<i>Molossidae</i>	Freetail-bat	9	13	1.00	150	0.50 x 0.50
<i>Vespertilionidae</i>	Vespertilionid Bat	6	10	1.00	150	0.50 x 0.50

Genus	Common Name	Head-Body Length (cm) <sup>1</sup>	Total Length (cm)	Minimum Enclosure Area (m <sup>2</sup> )	Minimum Enclosure Height (cm)	Additional Floor Area for Each Extra Animal (m)
<b>Rodents</b>						
<i>Conilurus</i>	Tree Rat	26	50	2.25	150	0.75 x 0.75
<i>Leggadina</i>	Short-tailed Mouse	10	17	0.25	40	0.25 x 0.25
<i>Leporillus</i>	Stick-nest Rat	26	44	4.00	100	1.00 x 1.00
<i>Mastacomys</i>	Broad-toothed Rat	17	30	0.56	40	0.40 x 0.40
<i>Mesembriomys</i>	Tree Rat	30	59	6.00	150	0.50 x 0.50
<i>Notomys</i>	Hopping Mouse	14	29	0.25	40	0.20 x 0.20
<i>Pseudomys</i>	Native Mouse	12	24	0.25	40	0.20 x 0.20
<i>Zyomys</i>	Rock Rats	19	34	1.00	40	0.40 x 0.40
<i>Hydromys</i>	Water Rat	37	69	9.00	100	2.00 x 2.00
<i>Xeromys</i>	False Water Rat	12	21	1.00	40	0.50 x 0.50
<i>Melomys</i>	Melomys	20	37	1.00	60	0.50 x 0.50
<i>Uromys</i>	Tree Rat	36	72	6.00	150	1.00 x 1.00
<i>Pogonomys</i>	Prehensile-tailed Rat	16	36	1.00	150	0.50 x 0.50
<i>Rattus</i>	Rats	22	40	1.00	40	0.50 x 0.50
<b>Dingo</b>						
<i>Canis lupus dingo</i>	Dingo	122	160	220.00	250	6.60 x 6.60

1 – Head-Body Length is measured from the tip of the nose to the base of the tail.

2 - Koala – dimensions given are for a totally enclosed enclosure. Open exhibits will require a larger floor area. The 240cm height listed is for totally enclosed enclosures.

3 *Macropus* Small – includes parma wallaby and tammar wallaby.

4 *Macropus* Medium – includes western brush wallaby, black-striped wallaby and red-necked wallaby.

5 *Macropus* Large – includes pretty-face wallaby, agile wallaby, eastern grey kangaroo, western grey kangaroo, common wallaroo, antilopine wallaroo, black wallaroo and red kangaroo.

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## **Acknowledgments**

Sincere thanks go to the NSW Fauna & Marine Parks Association Inc. and staff at Taronga Zoo for their valuable comments.