



Department of  
Primary Industries

# Standards for Exhibiting Carnivores in New South Wales



*Standards for Exhibiting Carnivores in New South Wales*

A publication of the NSW Department of Industry, Skills and Regional Development (pursuant to clause 8(1) of the Exhibited Animals Protection Regulation 2010)

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (August 2016). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent adviser.

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## Definitions

**approved** means approved in writing by the Secretary.

**Department** means the Department of Industry, Skills and Regional Development.

**exhibitor** means a person or company that has a Licence, Approval or Permit under the EAP Act.

**NSW DPI** means the NSW Department of Primary Industries, being a departmental office within the Department.

**Secretary** means the Secretary of the Department.

**EAP Act** means the *Exhibited Animals Protection Act 1986*.

## Part 1 – General

### Clause 1

### Scope of standards

1) These standards apply to all animals of species of the eutherian Order Carnivora (with the exception of: 1) seals; and 2) the Dingo *Canis familiaris* (or *Canis lupus dingo*) displayed, or kept for display, by exhibitors authorised under the EAP Act and must be used in conjunction with all other relevant existing standards and policies of the Department (including NSW DPI), where appropriate, including:

- General Standards for Exhibiting Animals in New South Wales.

#### Note

The Order Carnivora does not include the carnivorous marsupials. The prescribed standards applicable to seals are the *Standards for Exhibiting Seals in New South Wales*. The prescribed standards applicable to the Dingo are the *Standards for Exhibiting Australian Mammals in New South Wales*.

2) An applicant may seek the Secretary's approval to any variation of the application of these Standards. Before a variation can be approved an applicant must satisfy the Secretary that the proposed variation is appropriate for the particular species involved. The Secretary 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

### Enclosure fences

1) The boundary of a carnivore enclosure must be made secure against escape. Minimum dimensions of some materials that can be used in enclosure boundaries are set out under Appendix 1. Other materials and dimensions may be approved by the Secretary. Some examples include:

- a) Larger mesh sizes may be used in those parts of the enclosure boundaries that are above the reach of an average adult man adjacent to the fence. The mesh size must not be large enough to allow individuals of the species, including offspring, to escape through the wire.
- b) Solid walls (including glass panels) can be used rather than mesh if the Secretary is satisfied that the walls will be effective in containing the animals to be kept in the enclosure.

**Note**

Appendix 1 indicates that enclosures for some species, such as Red Panda, Binturong and Ferrets do not need a roof if smooth faced unclimbable walls of the prescribed height are used.

- c) Roofless enclosures may be used for species requiring a roof (indicated as “Roof” in the Inhang column of Appendix 1) if the Secretary is satisfied that the walls (in combination with any moats and electric hot wires) will be effective in containing the animals to be kept in the enclosure.
- d) Lower fence/wall or moat heights can be used if the Secretary is satisfied that suitable electric wires have been installed and that this configuration of fence/wall/ moat and electric hot wires will be effective in containing the animals to be kept in the enclosure.
- e) The use of high tensile wire as a modern display technique can be incorporated into enclosures as long as the Secretary is satisfied that they have been rigorously tested, they include secondary barriers such as electric wires to reduce access to the tensile wire, and the configuration will be effective in containing the animals kept in the enclosure.

2) Moating systems for carnivore enclosures must incorporate the following safety features:

- a) installations to prevent stormwater raising the level of the moat and it is recommended that a 50mm float valve be installed to maintain the correct water level at all times; and
- b) a base of clay or some other impervious material to limit the loss of water through the rock soil subgrade; and
- c) a barrier (possibly incorporating vegetation) on the viewing side of the moat to reduce the risk of visitors falling into the moat.

**Note**

Electric wires are recommended for open top enclosures and moated enclosures used to contain carnivores that have climbing ability.

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**Clause 4****Gates, doors and slides**

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- 1) Gates/doors/slides and other entry devices in enclosure boundaries must be placed so that there is no direct access to the enclosure from areas that are unable to safely and securely contain the enclosed animals.

**Exception** - Large gates can be incorporated into the perimeter fence of carnivore enclosures if the Secretary is satisfied that adequate security measures have been incorporated. These include standard operating procedures and physical installations that prevent the gates from being unlocked except by a person who has removed all unrestrained carnivores from the enclosure.

- 2) Design of main enclosures and holding facilities must ensure that the enclosed carnivore can be safely and routinely confined in or out of its main enclosure when access by staff to either section is necessary.
- 3) All gates/doors/slides and other entry devices must be as effective in containing the animals as the enclosure barrier. They must be designed and maintained to prevent the animal from damaging its safe operation and/or unfastening the securing device.
- 4) All gates/doors/slides and other entry devices must be designed and maintained so that they can be safely operated and secured in position as required. The control mechanism must be situated in an area so that the animal is unable to contact the person operating the controls.
- 5) All gates/doors/slides and other entry devices must be securely locked when closed. Locks used in carnivore enclosures must be of the type which only allow removal of the key once the lock is secured.

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**Clause 5****Enclosure furniture**

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- 1) Sight barriers must be provided so that animals have the opportunity to withdraw from visual contact.
- 2) A carnivore enclosure must contain a bathing pond/container with a diameter and depth sufficient to allow normal bathing behaviour if the Secretary determines that it is necessary in the circumstances.
- 3) The pond/container must have a non-slip surface and no sharp edges.
- 4) The pond/container must be kept filled with clean drinkable water. Ponds that are not cleaned daily must contain clean drinkable water at all times otherwise an additional water trough filled with clean drinkable water must be available to the enclosed animals.
- 5) Display enclosures and holding facilities for ursids, felids, procyonids and viverrids must include scratching posts or logs and climbing structures. These species must be able to climb to a minimum height of 1.8 metres, with the following exceptions:
  - a) Sun Bears must be provided with climbing structures at least 4.0 metres high.
  - b) Clouded Leopards must be provided with climbing structures at least 2.5 metres high.
- 6) Carnivores must have access to an area where they can bask in the sun.

- 7) Structural complexity must be provided within the enclosure, to allow carnivores opportunities to hide, climb and escape aggressive behaviour.
- 8) Fennec foxes, Otters and Meerkats are very active species so they require adequate stimulation to avoid developing stereotypic behaviour. They are known to develop stereotypic behaviour in small enclosures containing insufficient stimulation.

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**Clause 6****Spatial requirements**

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- 1) The size and shape of enclosures for carnivores must provide freedom of movement, both vertically and horizontally and must not fall below the minimum requirements set out in Appendix 1.
- 2) Enclosures may have less than the prescribed floor area if the exhibit is for an arboreal species and the additional height provides compensatory living room for the animals and the Secretary determines that it is necessary in the circumstances.
- 3) Small Clawed Otters – a water body suitable for swimming must be provided. The water body surface area must be no less than 25m<sup>2</sup> (for enclosures holding 1-10 animals). This surface area must be increased by 2.5m<sup>2</sup> for each additional animal. The depth of the water must be a minimum of 1.0 metre on display and 0.5m in off-exhibit areas that are used for medium- or long-term holding of animals. At least 50% of the pool area must be at the minimum depth.

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**Clause 7****Off-exhibit holding enclosures**

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- 1) Holding facilities for felids and ursids must include denning facilities so that all individuals in the holding facility may be denned separately.
- 2) Dens must be weatherproof and kept dry.

## Part 3 – Husbandry and management

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**Clause 8****Supervision of carnivores**

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Carnivores must be under the supervision of a person who has been adequately trained and capable of:

- a) safely handling and restraining the carnivores exhibited;
- b) minimising the likelihood of carnivore attacks on keepers, other members of staff, and members of the public;
- c) minimising undue stress experienced by carnivores;
- d) providing adequate diets for the carnivores held;
- e) recognising aberrant behaviour and indicators of ill health in the species under his/her supervision; and



- f) using an adequate firearm in cases of emergency.

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**Clause 9****Entering enclosures**

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- 1) All carnivores must be removed from their enclosure before any person is permitted to enter that enclosure, due to their potential danger to humans.
- 2) The requirements of (1) do not apply where:
  - a) the carnivores are tame specimens of the following animals: domestic dogs *Canis familiaris*, ferrets *Mustela putorius* or domestic cats *Felis catus*; or
  - b) where it is recognised that the animal(s) concerned is (are) at a stage of development (weighing less than 20kg) that presents no risk of serious injury to people; or
  - c) the carnivores weigh less than 20kg; or
  - d) the carnivore(s) is(are) anaesthetised by a veterinarian or other authorised person; or
  - e) the animal(s) is(are) restrained/netted; or
  - f) an experienced keeper enters an enclosure housing only red pandas or binturongs; or
  - g) protection is ensured by a vehicle which prevents contact between its occupants and any carnivore; or
  - h) the exhibitor permits an animal trainer to enter the enclosure for training or performance purposes in accordance with relevant safe work method statements, risk assessments, and other process necessary to comply with the exhibitor's duties and obligations under the *Work Health and Safety Act 2011*.

**Note**

A keeper should ordinarily remove a small carnivore from its enclosure prior to entering that enclosure.

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**Clause 10****Animals in public areas**

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- 1) Carnivores weighing more than 20kg must not be enclosed in walk-through enclosures.
- 2) An exhibitor must not cause or permit a member of the public to handle or touch a carnivore except where this occurs under the strict supervision of a suitably experienced member of the exhibitor's keeping staff, the animal weighs less than 20kg and the exhibitor believes, on reasonable grounds, that the animal presents no risk of injury to people.
- 3) An exhibitor must not cause or permit a carnivore weighing more than 20 kg to be removed from an enclosure for the purposes of allowing a member of the public to handle or touch it.
- 4) A safety fence must be provided to keep members of the public from coming into contact with enclosed carnivores.

- 5) The requirements of (1), (2) and (3) do not apply where the carnivores are tame specimens of the following animals: domestic dogs *Canis familiaris*, ferrets *Mustela putorius* or domestic cats *Felis catus*.

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**Clause 11****Feeding routine**

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If carnivores are to remain in an enclosure while food is being provided in the enclosure, it must be possible for the keepers to carry out this task from a position where they cannot be reached by the animal. Exemptions to this clause are found in clause 9(2)(a), (b), (c), (f), (g) and (h).

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**Clause 12****Animal service areas**

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- 1) Animal service areas adjacent to carnivore enclosures must contain well-marked danger zones and appropriate warning signs.
- 2) A high-pressure water hose or fire extinguisher (CO<sub>2</sub> type) for animal control must be available at all times for use in these areas.

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**Clause 13****Recapture plans**

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- 1) An exhibitor must not cause or permit a carnivore species to be exhibited until the Secretary is satisfied that the exhibitor has a suitable plan for recapture of individuals of that species that have escaped (a) from an enclosure, and (b) from an enclosure and from the exhibitor's establishment.
- 2) Adequate firearms must be kept on the premises for use in case of emergency by appropriately trained staff. Firearms must be safely used and stored at all times in accordance with the *Firearms Act 1996*.

## Part 4 – Health

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**Clause 14****Veterinary care and preventative medicine**

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An exhibitor must not cause or permit a carnivore species to be exhibited until the Secretary is satisfied that the exhibitor has established a program by which the exhibitor's veterinarian will:

- a) vaccinate that species for viral diseases; and
- b) monitor and control the level of internal and external parasites of that species; and
- c) be able to safely anaesthetise individuals of that species when required.

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**Clause 15****Panleucopenia**

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Due to the possibility of transmitting panleucopenia exhibitors must be able to demonstrate that they have taken all reasonable steps to exclude stray cats (*Felis catus*) from establishments exhibiting felines, mustelids or procyonids.

## Part 5 – Behaviour

### Clause 16

### Inter- and intra-specific interaction

- 1) Enclosures must contain no more than one species of carnivore except where the enclosure allows space sufficient to ensure the avoidance of inter-specific aggression or stress. Carnivore species that hybridise must not be kept in the same enclosure.
- 2) If a carnivore is being unduly stressed by the aggression/presence of another carnivore(s) in the enclosure, then it, or the other carnivore(s), must be removed from the enclosure.
- 3) Felids are to be housed in any one of the following ways:
  - a) alone (except lions) or as a female with her sub-adult offspring;
  - b) as a compatible pair, with or without sub-adult offspring;
  - c) as a single sex group (only in the case of lions and cheetahs);
  - d) as a juvenile group while all animals remain under breeding age; or
  - e) as a pride in the case of African lions.
- 4) Canids are to be housed in one of the following ways:
  - a) as a pack;
  - b) as a lone female with her sub-adult offspring;
  - c) as a compatible pair, with or without sub-adult offspring; or
  - d) as a single sex group.
- 5) Meerkats are to be housed as groups or pairs due to their highly social nature.

**Note**

The off-exhibit medium-term holding enclosures for meerkats should preferably adjoin the exhibit. This is particularly valuable for managing breeding groups as it allows new animals to be introduced more safely.

- 6) A carnivore which, in the opinion of the Secretary, is of a social species (social group “G” and “P” in Appendix 2) must not be exhibited alone except as required for veterinary reasons or where the exhibitor is arranging for acquisition of a mate or disposal of the animal to another establishment. Signage for such a lone animal must explain the normal social grouping of the species and advise of the intended acquisition of a mate or its intended disposal to another establishment.
- 7) The breeding of carnivores may be required to follow a program recommended by the Zoo and Aquarium Association.

- 8) Except as the Secretary otherwise authorises, transportation of a carnivore within Australia by NSW exhibitors must comply with the IATA (International Air Transport Association) regulations for that carnivore species.

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## APPENDIX 1 – Enclosure dimensions and materials

- The minimum floor surface area for a medium-term holding enclosure is indicated by the figure in brackets in the second column. The maximum number of animals that can be held in a medium-term holding enclosure of this size is indicated in column three.
- Mesh fence height is from ground level to the point where the roof starts or, in the case of unroofed enclosures, the point where the inhang starts.
- \*\*\* in columns 6,7,8 means these animals must not be enclosed by a moat or an unroofed mesh fence.
- All moats must be wet with the exception of the bears, which can have wet or dry moats.
- Roof – unroofed, mesh-fenced enclosures, even with an inhang, are not permitted for this species.
- A – roof not needed if perimeter walls are not climbable.
- Mesh space – the maximum permitted aperture of mesh forming an enclosure barrier.

| NAME  | SURF. AREA (SQ.M) | MAX. NO. ANIMALS FOR ENCLOS. SIZE | ADDIT. AREA FOR EACH EXTRA ANIMAL IN EXHIBIT (m <sup>2</sup> ) | ADDITION. AREA FOR EACH EXTRA ANIMAL IN MEDIUM-TERM HOLDING YARD (m <sup>2</sup> ) | HEIGHT ABOVE WATER OF WALL ADJOIN. MOAT (M) | MOAT WIDTH (M) | MOAT DEPTH (M) | SMOOTH FACED UNCLIMBABLE WALL (M) | MESH FENCE HEIGHT (M) | WIRE MESH DIAM. (MM) | MESH SPACE (MM) | DEPTH OF INHANG (M) | INHANG (Degrees above horiz) |
|---|-------------------|-----------------------------------|--|--|---|----------------|----------------|-----------------------------------|-----------------------|----------------------|-----------------|---------------------|------------------------------|
| <b>FAMILY Canidae</b>                                       |                   |                                   |  |  |   |                |                |                                   |                       |                      |                 |                     |                              |
| New Guinea Wild Dog<br><i>Canis familiaris (hallstromi)</i> | 200(25)           | 2                                 | 15   | 10   | 1.0   | 2.5            | 1.8            | -                                 | 2.5                   | 3                    | 75 x 50         | 0.7                 | 45                           |
| Maned Wolf<br><i>Chrysocyon brachyurus</i>                  | 200(25)           | 2                                 | 15   | 10   | 1.0   | 2.5            | 2.0            | -                                 | 2.0                   | 3                    | 75 x 50         | 0.5                 | 45                           |
| Dhole<br><i>Cuon alpinus</i>                                | 200(25)           | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 2.5                   | 3                    | 75 x 50         | 0.7                 | 45                           |
| Fennec Fox<br><i>Fennecus zerda</i>                         | 60(10)            | 2                                 | 5  | 5  | 1.0   | 2.5            | 1.0            | -                                 | 2.0                   | 2                    | 50 x 50         | 0.3                 | 45                           |
| African Wild Dog<br><i>Lycaon pictus</i>                    | 400(50)           | 2                                 | 15   | 15   | 1.0   | 3.5            | 2.0            | -                                 | 2.0                   | 3                    | 75 x 50         | 0.5                 | 45                           |
| European Red Fox<br><i>Vulpes vulpes</i>                    | 100(25)           | 2                                 | 10   | 7  | ***   | ***            | ***            | -                                 | 2.4                   | 3                    | 50 x 50         | Roof                | Roof                         |

| NAME  | SURF. AREA (SQ.M) | MAX. NO. ANIMALS FOR ENCLOS. SIZE | ADDIT. AREA FOR EACH EXTRA ANIMAL IN EXHIBIT (m <sup>2</sup> ) | ADDITION. AREA FOR EACH EXTRA ANIMAL IN MEDIUM-TERM HOLDING YARD (m <sup>2</sup> ) | HEIGHT ABOVE WATER OF WALL ADJOIN. MOAT (M) | MOAT WIDTH (M) | MOAT DEPTH (M) | SMOOTH FACED UNCLIMBABLE WALL (M) | MESH FENCE HEIGHT (M) | WIRE MESH DIA. (MM) | MESH SPACE (MM) | DEPTH OF INHANG (M) | INHANG (Degrees above horiz) |
|---|-------------------|-----------------------------------|--|--|---|----------------|----------------|-----------------------------------|-----------------------|---------------------|-----------------|---------------------|------------------------------|
| <b>FAMILY Ursidae</b>                             |                   |                                   |  |  |   |                |                |                                   |                       |                     |                 |                     |                              |
| American Black Bear<br><i>Ursus americanus</i>    | 300(30)           | 2                                 | 20   | 15   | 2.0   | 3.0            | 4.0            | -                                 | 4.0                   | 5                   | 75 x 50         | 1.0                 | 45                           |
| Syrian Brown Bear<br><i>Ursus arctos syriacus</i> | 300(30)           | 2                                 | 20   | 15   | 2.0   | 3.0            | 4.0            | -                                 | 4.0                   | 5                   | 75 x 50         | 1.0                 | 45                           |
| Kodiak Bear<br><i>Ursus a. middendorffi</i>       | 300(30)           | 2                                 | 20   | 15   | 2.0   | 3.0            | 4.0            | -                                 | 4.0                   | 5                   | 75 x 50         | 1.0                 | 45                           |
| Malayan Sun Bear<br><i>Helarctos malayanus</i>    | 200(20)           | 2                                 | 15   | 10   | 2.0   | 3.0            | 2.5            | 3.5                               | 2.8                   | 5                   | 75 x 50         | 1.0                 | 45                           |
| <b>FAMILY Mustelidae</b>                          |                   |                                   |  |  |   |                |                |                                   |                       |                     |                 |                     |                              |
| Small-clawed Otter<br><i>Amblonyx cinerea</i>     | 100(10)           | 10                                | 5  | 5  | -   | -              | -              | 1.3                               | 1.5                   | 2                   | 50 X 50         | 0.3                 | 45                           |
| Ferret<br><i>Mustela putorius</i>                 | 15(3)             | 3                                 | 1  | 1  | ***   | ***            | ***            | 1.2                               | 1.5                   | 1                   | 10 X 10         | Roof <sup>A</sup>   | Roof <sup>A</sup>            |
| <b>FAMILY Procyonidae</b>                         |                   |                                   |  |  |   |                |                |                                   |                       |                     |                 |                     |                              |
| Red Panda<br><i>Ailurus fulgens</i>               | 100(10)           | 2                                 | 5  | 5  | ***   | ***            | ***            | 1.5                               | 3.6                   | 2                   | 75 x 50         | Roof <sup>A</sup>   | Roof <sup>A</sup>            |
| <b>FAMILY Viverridae</b>                          |                   |                                   |  |  |   |                |                |                                   |                       |                     |                 |                     |                              |
| Binturong<br><i>Arctictis binturong</i>           | 100(10)           | 2                                 | 5  | 5  | ***   | ***            | ***            | 1.4                               | 3.6                   | 3                   | 75 x 50         | Roof <sup>A</sup>   | Roof <sup>A</sup>            |

| NAME   | SURF. AREA (SQ.M) | MAX. NO. ANIMALS FOR ENCLOS. SIZE | ADDIT. AREA FOR EACH EXTRA ANIMAL IN EXHIBIT (m <sup>2</sup> ) | ADDITION. AREA FOR EACH EXTRA ANIMAL IN MEDIUM-TERM HOLDING YARD (m <sup>2</sup> ) | HEIGHT ABOVE WATER OF WALL ADJOIN. MOAT (M) | MOAT WIDTH (M) | MOAT DEPTH (M) | SMOOTH FACED UNCLIMBABLE WALL (M) | MESH FENCE HEIGHT (M) | WIRE MESH DIA. (MM) | MESH SPACE (MM) | DEPTH OF INHANG (M) | INHANG (Degrees above horiz) |
|--|-------------------|-----------------------------------|--|--|---|----------------|----------------|-----------------------------------|-----------------------|---------------------|-----------------|---------------------|------------------------------|
| <b>FAMILY Felidae</b>                            |                   |                                   |  |  |   |                |                |                                   |                       |                     |                 |                     |                              |
| Puma<br><i>Puma concolor</i>                     | 200(30)           | 2                                 | 20   | 15   | ***   | ***            | ***            | -                                 | 3.0                   | 5                   | 75 x 50         | Roof                | Roof                         |
| Serval<br><i>Leptailurus serval</i>              | 85(15)            | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 3.0                   | 3                   | 75 x 50         | Roof                | Roof                         |
| Asiatic Golden Cat<br><i>Catopuma temminckii</i> | 85(15)            | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 3.0                   | 3                   | 75 x 50         | Roof                | Roof                         |
| Fishing Cat<br><i>Prionailurus viverrinus</i>    | 85(15)            | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 3.0                   | 3                   | 75 x 50         | Roof                | Roof                         |
| Jaguarundi<br><i>Felis yagouarandi</i>           | 85(15)            | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 3.0                   | 3                   | 75 x 50         | Roof                | Roof                         |
| Caracal<br><i>Caracal caracal</i>                | 85(15)            | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 3.0                   | 3                   | 75 x 50         | Roof                | Roof                         |
| Bobcat<br><i>Lynx rufus</i>                      | 85(15)            | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 3.0                   | 3                   | 75 x 50         | Roof                | Roof                         |
| Cheetah<br><i>Acinonyx jubatus</i>               | 400(30)           | 2                                 | 20   | 15   | 1.8   | 6              | 1.8            | -                                 | 2.5                   | 3                   | 75 x 50         | 0.5                 | 45                           |
| Clouded Leopard<br><i>Neofelis nebulosa</i>      | 85(15)            | 2                                 | 15   | 10   | ***   | ***            | ***            | -                                 | 3.6                   | 3                   | 75 x 50         | Roof                | Roof                         |
| Lion<br><i>Panthera leo</i>                      | 300(30)           | 2                                 | 20   | 15   | 1.8   | 8              | 1.8            | -                                 | 4.5 <sup>1</sup>      | 5                   | 75 x 50         | 1.0                 | 45                           |



| NAME                                 | SURF. AREA (SQ.M) | MAX. NO. ANIMALS FOR ENCLOS. SIZE | ADDIT. AREA FOR EACH EXTRA ANIMAL IN EXHIBIT (m <sup>2</sup> ) | ADDITION. AREA FOR EACH EXTRA ANIMAL IN MEDIUM-TERM HOLDING YARD (m <sup>2</sup> ) | HEIGHT ABOVE WATER OF WALL ADJOIN. MOAT (M) | MOAT WIDTH (M) | MOAT DEPTH (M) | SMOOTH FACED UNCLIMBABLE WALL (M) | MESH FENCE HEIGHT (M) | WIRE MESH DIA. (MM) | MESH SPACE (MM) | DEPTH OF INHANG (M) | INHANG (Degrees above horiz) |
|--------------------------------------|-------------------|-----------------------------------|--|--|---|----------------|----------------|-----------------------------------|-----------------------|---------------------|-----------------|---------------------|------------------------------|
| Jaguar<br><i>Panthera onca</i>       | 200(30)           | 2                                 | 20   | 15   | ***   | ***            | ***            | -                                 | 3.6                   | 5                   | 75 x 50         | Roof                | Roof                         |
| Leopard<br><i>Panthera pardus</i>    | 200(30)           | 2                                 | 20   | 15   | ***   | ***            | ***            | -                                 | 3.6                   | 5                   | 75 x 50         | Roof                | Roof                         |
| Tiger<br><i>Panthera tigris</i>      | 300(30)           | 2                                 | 20   | 15   | 1.8   | 8              | 1.8            | -                                 | 4.5 <sup>1</sup>      | 5                   | 75 x 50         | 1.0                 | 45                           |
| Snow Leopard<br><i>Uncia uncia</i>   | 200(30)           | 2                                 | 20   | 15   | ***   | ***            | ***            | -                                 | 3.6                   | 3                   | 75 x 50         | Roof                | Roof                         |
| <b>FAMILY Herpestidae</b>            |                   |                                   |  |  |   |                |                |                                   |                       |                     |                 |                     |                              |
| Meerkat<br><i>Suricata suricatta</i> | 60(10)            | 6                                 | 5  | 2  | 1.0   | 1.5            | 0.75           | 1.2                               | 1.5                   | 2                   | 10 x 10         | Roof <sup>A</sup>   | Roof <sup>A</sup>            |

<sup>1</sup> The minimum mesh fence height, and minimum roof height, for a fully enclosed off-exhibit enclosure is 3.6 m.

## APPENDIX 2 – Carnivore biology and exhibit guide

Solid walls advised – means that the species is able to climb typical wire fences and may be able to climb over wire inhangs.

| Species   | Social group | Peak Activity | Level | Mesh o/hang needed | Roof Needed | Wire under substrate | Solid walls advised | Piano wire permissible | Glass front permissible | Moat    | Water feature advised |
|---|--------------|---------------|-------|--------------------|-------------|----------------------|---------------------|------------------------|-------------------------|---------|-----------------------|
| <b>FAMILY Canidae</b>                                       |              |               |       |                    |             |                      |                     |                        |                         |         |                       |
| New Guinea Wild Dog<br><i>Canis familiaris (hallstromi)</i> | G            | C             | T     | yes                | -           | Pe                   | -                   | yes                    | yes                     | wet     | -                     |
| Maned Wolf<br><i>Chrysocyon brachyurus</i>                  | S/P          | C/N           | T     | yes                | -           | Pe                   | -                   | yes                    | yes                     | wet     | -                     |
| Dhole<br><i>Cuon alpinus</i>                                | G            | C             | T     | yes                | -           | Pe                   | -                   | yes                    | yes                     | no      | yes                   |
| Fennec Fox<br><i>Fennecus zerda</i>                         | P            | N             | T     | yes                | -           | E                    | -                   | -                      | yes                     | -       | -                     |
| African Wild Dog<br><i>Lycan pictus</i>                     | G            | C             | T     | yes                | -           | Pe                   | -                   | yes                    | yes                     | wet     | -                     |
| Red Fox<br><i>Vulpes vulpes</i>                             | P            | N             | T     | -                  | yes         | E                    | -                   | yes                    | yes                     | -       | -                     |
| <b>FAMILY Ursidae</b>                                       |              |               |       |                    |             |                      |                     |                        |                         |         |                       |
| Black Bear<br><i>Ursus americanus</i>                       | S            | D/C           | T/A   | yes                | -           | S                    | -                   | -                      | yes                     | wet/dry | yes                   |
| Syrian Brown Bear<br><i>Ursus arctos syriacus</i>           | S            | D/C           | T     | yes                | -           | S                    | -                   | -                      | yes                     | wet/dry | yes                   |
| Kodiak Bear<br><i>Ursus a. middendorffi</i>                 | S            | D/C           | T     | yes                | -           | S                    | -                   | -                      | yes                     | wet/dry | yes                   |
| Sun Bear<br><i>Helarctos malayanus</i>                      | S            | N/C           | T/A   | yes                | -           | S                    | yes                 | -                      | yes                     | wet/dry | -                     |

| Species  | Social group | Peak Activity | Level | Mesh o/hang needed | Roof needed | Wire under substrate | Solid walls advised | Piano wire permissible | Glass front permissible | Moat | Water feature |
|--|--------------|---------------|-------|--------------------|-------------|----------------------|---------------------|------------------------|-------------------------|------|---------------|
| <b>FAMILY Mustelidae</b>                         |              |               |       |                    |             |                      |                     |                        |                         |      |               |
| Small-clawed otter<br><i>Amblonyx cinerea</i>    | G            | D             | T/Aq  | yes                | -           | S                    | yes                 | -                      | yes                     | -    | yes           |
| Ferret<br><i>Mustela putorius</i>                | S            | D/C           | T/B   | yes                | -           | S                    | yes                 | -                      | yes                     | -    | -             |
| <b>FAMILY Procyonidae</b>                        |              |               |       |                    |             |                      |                     |                        |                         |      |               |
| Red Panda<br><i>Ailurus fulgens</i>              | S            | N             | A     | -                  | -           | -                    | yes                 | yes                    | yes                     | -    | -             |
| <b>FAMILY Viverridae</b>                         |              |               |       |                    |             |                      |                     |                        |                         |      |               |
| Binturong<br><i>Arctictis binturong</i>          | S            | N             | A     | -                  | -           | -                    | yes                 | yes                    | yes                     | -    | -             |
| <b>FAMILY Felidae</b>                            |              |               |       |                    |             |                      |                     |                        |                         |      |               |
| Puma<br><i>Puma concolor</i>                     | S            | C/N           | T/A   | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -             |
| Serval<br><i>Leptailurus serval</i>              | S            | C             | T     | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -             |
| Asiatic Golden Cat<br><i>Catopuma temminckii</i> | S            | N             | T/A   | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -             |
| Fishing Cat<br><i>Prionailurus viverrinus</i>    | S            | C/N           | T     | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | yes           |
| Jaguarundi<br><i>Felis yagouarandi</i>           | S            | D/C           | T     | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -             |
| Caracal<br><i>Caracal caracal</i>                | S            | N             | T     | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -             |

| Species                                     | Social group | Peak Activity | Level | Mesh o/hang needed | Roof needed | Wire under substrate | Solid walls advised | Piano wire permissible | Glass front permissible | Moat | Water feature advised |
|---|--------------|---------------|-------|--------------------|-------------|----------------------|---------------------|------------------------|-------------------------|------|-----------------------|
| Bobcat<br><i>Lynx rufus</i>                 | S            | C             | T     | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -                     |
| Cheetah<br><i>Acinonyx jubatus</i>          | S/G          | D             | T     | yes                | -           | S                    | -                   | yes                    | yes                     | wet  | -                     |
| Clouded leopard<br><i>Neofelis nebulosa</i> | S            | C/N           | T/A   | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -                     |
| Lion<br><i>Panthera leo</i>                 | G            | C/N           | T     | yes                | -           | S                    | -                   | -                      | yes                     | -    | -                     |
| Jaguar<br><i>Panthera onca</i>              | S            | C/N           | T/A   | -                  | yes         | S                    | -                   | -                      | yes                     | -    | -                     |
| Leopard<br><i>Panthera pardus</i>           | S            | N             | T/A   | -                  | yes         | S                    | -                   | -                      | yes                     | -    | -                     |
| Tiger<br><i>Panthera tigris</i>             | S            | C/N           | T     | yes                | -           | S                    | -                   | -                      | yes                     | wet  | yes                   |
| Snow Leopard<br><i>Uncia uncia</i>          | S            | N             | T     | -                  | yes         | S                    | -                   | yes                    | yes                     | -    | -                     |
| <b>FAMILY Herpestidae</b>                   |              |               |       |                    |             |                      |                     |                        |                         |      |                       |
| Meerkat<br><i>Suricata suricatta</i>        | G            | D             | T     | yes                | -           | E                    | yes                 | -                      | yes                     | -    | -                     |

Table 1 - Abbreviations used in the table are:-

|                               |                             |                                   |  |
|-------------------------------|-----------------------------|-----------------------------------|--|
| <b>Social Group</b> -         | S = solitary                | G = group/family                  | P = bonded pairs   |
| <b>Peak Activity</b> -        | C = crepuscular             | N = nocturnal                     | D = diurnal / = denotes a combination of active periods      |
| <b>Activity Level</b> -       | T = terrestrial             | A = arboreal                      | Aq = aquatic B = Burrows / = denotes a combination of levels |
| <b>Wire Under Substrate</b> - | Pe = perimeter <sup>1</sup> | S = sink into ground <sup>2</sup> | E = entire floor area must be lined with subterranean wire   |

1 – Perimeter means the wire needs to only go across the surface of the ground at least 1m around the perimeter.

2 – Perimeter means the wire needs to only go into the ground at least 1m around the perimeter.