

# PEST RISK ASSESSMENT

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## Meerkat

*Suricata suricatta*



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**About this Pest Risk Assessment**

This pest risk assessment is developed in accordance with the *Policy and Procedures for the Import, Movement and Keeping of Vertebrate Wildlife in Tasmania* (DPIPWE 2011). The policy and procedures set out conditions and restrictions for the importation of controlled animals pursuant to s32 of the *Nature Conservation Act 2002*. This pest risk assessment is prepared by DPIPWE for the use within the Department.

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# I. Summary

The meerkat (*Suricata suricatta*) is a member of the mongoose family (Herpestidae). They are small, omnivorous mammals native to the Southern African subregion and have not been reported as pest species establishing in any other region (Page *et al.* 2008). As a result, there are no reported consequences of establishment, although the impact on Tasmanian fauna through diet and competition could be significant. Meerkats are considered a 'moderate' threat under the Vertebrate Pest Committee's threat categorisation and are 'controlled animals' under the Tasmanian *Nature Conservation Act 2002*. This risk assessment concludes that meerkats are a 'moderate' threat to Tasmania and proposes that imports be restricted to those license holders approved for keeping moderate threat species.

## 2. Introduction

### 2.1 NAME AND TAXONOMY

**Kingdom:** Animalia  
**Phylum:** Chordata  
**Class:** Mammalia  
**Order:** Canivora  
**Family:** Herpestidae  
**Genus:** Suricata  
**Species:** *S. suricatta* (Schreber, 1776)

**Sub-species:** *S. s. iona* (Cabral, 1971), *S. s. majoriae* (Bradfield, 1936), *S. s. suricatta* (Schreber, 1776).

**Common names (including industry or trade names):** meerkat, slender-tailed meerkat, suricate, gray meerkat, cooperative meerkat.

**Known hybrids:** None known

**Close relatives:** Other Herpestidae include the yellow mongoose (*Cynictis penicillata*), dwarf mongoose (*Helogale parvula*), banded mongoose (*Mungos mungo*) and Indian mongoose (*Herpestes javanicus*) (Myers *et al.* 2008). The Indian mongoose (*Herpestes javanicus*) has been included on the IUCN's Global Invasive Species Group's list of the top 100 invasive species. This species was deliberately released on islands of the West Indies, Mauritius, Fiji, and Hawaii to reduce rodent impacts on crops, particularly sugar cane. These introductions are thought to have contributed to the extinction of at least three species. It is also a vector for rabies (Global Invasive Species Database, 2011).

### 2.2 DESCRIPTION

Meerkats are one of the smallest members of the mongoose family. The body is long and slender with a pointed snout, thin legs and a slim tapering tail. In adults, the length of the head and body is 24.5-29 cm, with tail length of 19-24cm (van Staaden, 1994). Weight can range from 600g to 2.5kg, with no sexual dimorphism in the species (Kimble, 2003; van Staaden, 1994).

Fur is soft with long guard hairs and varies in colour throughout the distributional range to be a light grizzled grey, tan, or silvery-brown (van Staaden, 1994). The underfur is dark rufous in colour, and markings on the ears, tip of the tail, eye patches and transverse bars on the rear portion of the back are black (van Staaden, 1994).

Meerkats have strong curved claws that are 2cm long and are used for searching and digging for food items and altering underground burrows (Gough-Palmer *et al.* 2008). Four toes are on each foot, and the first digit is vestigial (Gough-Palmer *et al.* 2008).



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Neonates are born with sparse, short hair and their eyes and ears closed (van Staaden, 1994). Juveniles share a similar appearance to adults.

Meerkats can be distinguished from other mongooses by the dorsal banding on their fur, their enlarged foreclaws and tapering, furred tails which, unlike most mongooses, are not bushy (van Staaden, 1994). These characteristics, in combination with other traits as described above, can be used to distinguish meerkats from small Australian native mammals such as bandicoots, potaroos and quolls, and non-native species such as ferrets and weasels.

## 2.3 CONSERVATION AND LEGAL STATUS

### CONSERVATION STATUS

Meerkats are currently listed as a species of ‘least concern’ under the IUCN Red List (Macdonald & Hoffmann 2008).

### LEGAL STATUS

The species is classed as a ‘moderate’ threat under the Vertebrate Pest Committee’s threat categories (Page *et al.* 2008).

Under the *Environment Protection and Biodiversity Conservation Act 1999*, meerkats are listed as ‘specimens taken to be suitable for live import’ and require a permit to import issued under this Act. Eligible imports are for non-commercial purposes only (i.e. zoos) and exclude household pets.

Meerkats are ‘controlled animals’ under the *Tasmanian Nature Conservation Act 2002*.

# 3. Biology and Ecology

## 3.1 LIFE HISTORY

Breeding among meerkats is seasonal and is influenced by rainfall and temperature (Russel *et al.* 2002). Meerkat breeding seasons and litter numbers increase with high rainfall levels (Russel *et al.* 2002); however breeding may cease when rainfall is unusually low (Clutton-Brock *et al.* 1999b). High temperature has a negative effect on pup development, with pup growth and survival declining in greater temperatures (Russel *et al.* 2002).

Meerkats are cooperative breeders. In a group of meerkats (between 2-30 individuals), breeding is commonly confined to the dominant male and female couple, with all adults in the group assisting to feed and guard the young (Griffin *et al.* 2003; Clutton-Brock *et al.* 1998). Multiple females may breed when food is abundant, although dominant females produce more litters than subordinates (Clutton-Brock *et al.* 1998).

Females rarely breed before 24 months of age and have a post-partum oestrus, enabling them to become pregnant immediately following the birth of their young (Clutton-Brock *et al.* 1999b). In the wild, meerkats can have up to three litters per year of 3-5 young in good conditions (Clutton-Brock *et al.* 1999b), but in captivity, females can breed all year round and have the potential to produce four to five litters per year (Kimble, 2003).

After a gestation period of around 60 days (Clutton-Brock *et al.* 1999b), neonates are born in the den burrow (van Staaden, 1994). Pups rely on their mother for milk, although examples have been recorded of subordinate females lactating to support breeding attempts (Clutton-Brock *et al.* 1999b). At five weeks of age, young meerkats leave the burrow and travel with the group on foraging trips. Young are weaned when they are approximately 2 months old (Clutton-Brock *et al.* 1999b).

There is no scientific evidence of this species storing sperm or hybridising with other species.

## 3.2 HABITAT REQUIREMENTS AND PREFERENCES

Meerkats prefer areas of arid open ground with scrub and short grasses, and can be found in a variety of habitats including savannah, open plains, alkaline pans and banks of water courses (van Staaden, 1994). They are absent from true desert and forested areas and also mountainous terrain (Macdonald & Hoffmann, 2008).

Meerkats require soil to prepare burrows, which are generally raised above the surrounding soil. The burrow system may have up to 15 entrances, and is comprised of a series of interconnected tunnels (approximately 1.0-1.5m long and 75mm high) leading to chambers approximately 300mm high and 150-450mm long (Lynch, 1980). In a group's range, two to five burrows may be used for sleeping and multiple burrow systems used for bolt holes and temporary burrows (Smithers & Chimimba, 2005; van Staaden, 1994). Meerkats are adept at digging burrows but also expel and occupy burrows of South African ground squirrels (*Xerus inauris*) and yellow mongooses (*Cynictis penicillata*). They may also share burrows with these species (Smithers & Chimimba, 2005).

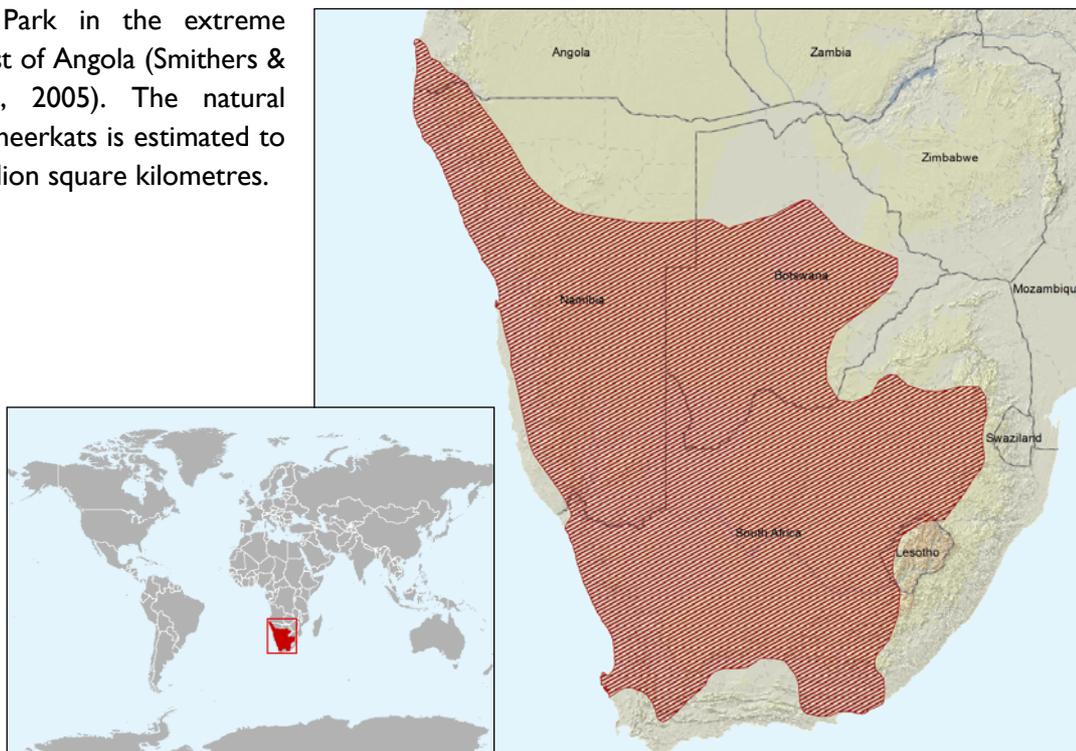
Distribution appears to be restricted to areas with a mean rainfall up to about 600mm. Distribution has also been associated with soil type, with records indicating that meerkats prefer hard, often stony or calcareous substrate (Smithers & Chimimba, 2005).

Meerkats are sensitive to low and high temperatures. Temperature varies significantly in southern Africa; between 21-39°C in summer and -4-26°C in winter (van Staaden, 1994). To regulate their body temperature, individuals spend up to an hour warming themselves prior to foraging, and often spend the middle part of the day resting in the shade or their burrows to avoid overheating (Russel *et al.* 2002). The burrows moderate temperature, and daily temperature variation in deeper burrows is less than 1°C. In measuring daily variation in burrow temperature, Van Staaden (1994) recorded changes from 22.6-23.2°C in summer and 10.0-10.8°C in winter.

In cold environments, meerkats employ behavioral mechanisms to reduce the energetic costs of thermoregulation, such as sunbathing, huddling and sleeping densely packed in burrows at night (van Staaden, 1994).

### 3.3 NATURAL GEOGRAPHIC RANGE

As shown in Figure 1, the meerkat is widely distributed throughout the Southern African subregion, occupying western and southern Namibia, south-western Botswana and north and west South Africa (Macdonald & Hoffmann, 2008). A narrow extension of distribution enters the Iona National Park in the extreme south-west of Angola (Smithers & Chimimba, 2005). The natural range of meerkats is estimated to be 1.8 million square kilometres.



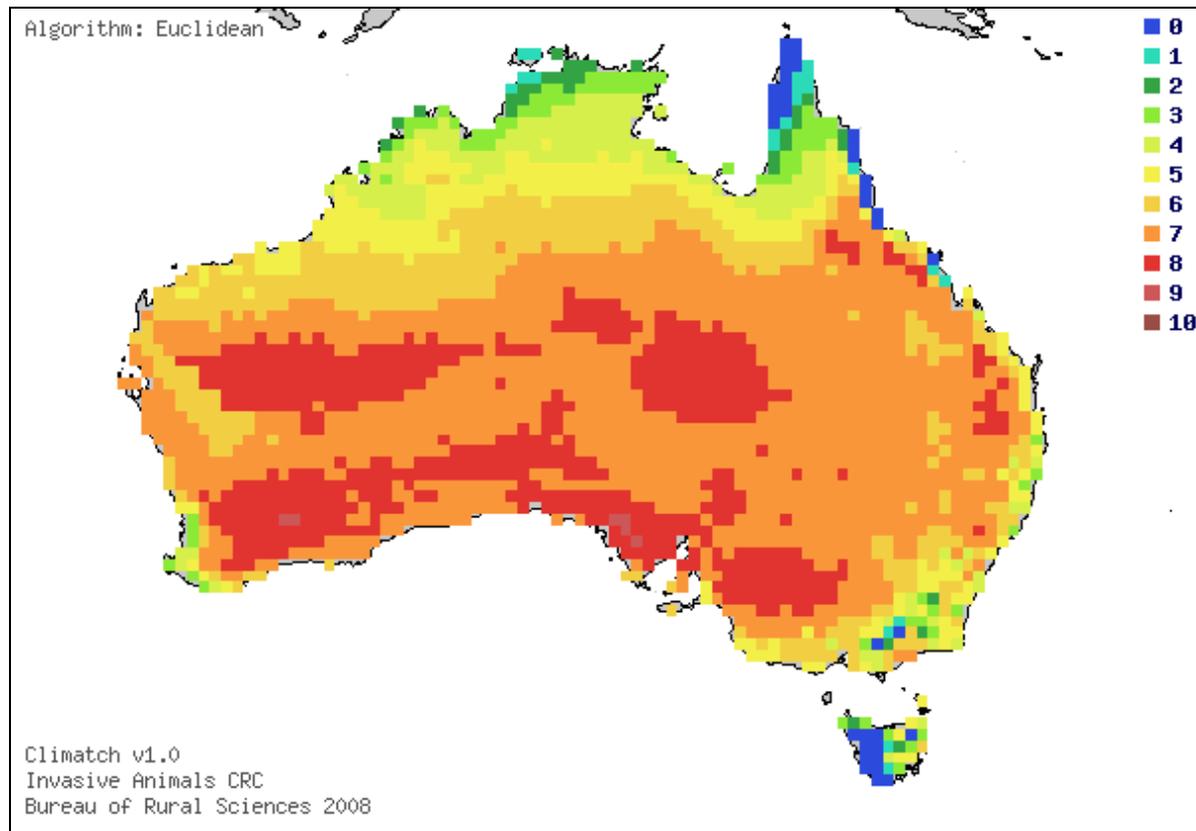
**Figure 1.** Native resident range of the meerkat (*S. suricatta*) in Africa (modified from Macdonald & Hoffmann, 2008).

### 3.4 INTRODUCED GEOGRAPHIC RANGE

There is no evidence of meerkats establishing feral (non-naturally occurring) populations outside their native range (Macdonald & Hoffmann, 2008; Page *et al.* 2008), and no introduction attempts have been noted. The species is not recorded on the Global Invasive Species Database (Global Invasive Species Database, 2011).

### 3.5 POTENTIAL DISTRIBUTION IN TASMANIA

Using modelling applications by the Bureau of Rural Science (DAFF), climate is compared between the species' current distribution and potential Australian distribution (shown in Figure 2). Modelling indicates that Australia has areas of similar climate which may support the establishment of introduced meerkat populations. Tasmania's climate is only moderately suitable (highest climate match score: 6), with regions to the east, north-east and far north-west having the most suitable climates to support meerkat populations.



**Figure 2.** Climate comparison between the natural range of *S. suricatta* and Australia, where 10 is a 'perfect' climate match and 0 is having a very dissimilar climate. Tasmania shows a match between 0 and 6. (Distribution source: Macdonald & Hoffmann, 2008).

### 3.6 DIET AND FEEDING BEHAVIOUR

Meerkats are omnivorous, and diet varies with seasonal food availability. Meerkats frequently feed on scorpions, Coleoptera, Orthoptera and Hymenoptera, with insects comprising 78% of the diet; and infrequently eat spiders, myriapods and solifugids (Doolan & Macdonald, 1996). Meerkats may also kill and eat small vertebrates such as mice, birds, amphibians, snakes and lizards, and consume eggs, plant roots, fruits, seeds and tubers (van Staaden, 1994). Instances of meerkats catching and consuming baby hares have also been recorded (R.A. Goss; pers. comm. cited in Smithers & Chimimba, 2005).

Meerkats feed during the day and forage individually while maintaining visual and vocal contact with the rest of the group (van Staaden, 1994). When foraging, the head is held low with the tail trailing and the back sloping forward. They continuously sniff crevices, vegetation and dead wood and dig and turn stones with their front claws in search of food (Smithers & Chimimba, 2005; van Staaden, 1994). Packs forage systematically throughout their range, taking a new route each day to allow food to regenerate between visits. A group may forage over a range of 15km and this may include several burrow systems which they migrate between depending on food availability, population density, flooding and predators (van Staaden, 1994).

### 3.7 SOCIAL BEHAVIOUR AND GROUPINGS

Meerkats are highly sociable animals. They live in groups of 2-30 individuals (comprising multiple males and females) which are highly amicable towards each other. Groups forage, rest and sleep together, and contribute to the feeding, raising and guarding of young (van Staaden, 1994). Members of the group groom and young individuals play around the burrow or siesta sites, involving chasing, hugging and rolling (Smithers & Chimimba, 2005).

Group membership is largely stable, although animals of both sexes may disperse to other groups. Males may come and go from their natal group and commonly join existing groups, while females are less likely to leave the natal group, and if so, may establish a new group or form a splinter group of females (Smithers & Chimimba, 2005).

To reduce their vulnerability to predation, meerkats maintain a vigilant sentinel system. While other meerkats are foraging, an individual animal climbs to a vantage point and watches out for predators by turning their head side to side. The sentinel is often a member of the group who has fed successfully and needs to digest their food (T.H. Clutton-Brock; pers. comms cited in Smithers & Chimimba, 2005). Guards call intermittently to the rest of the group to inform them of their presence, and will sound a brief, sharp alarm call when they see a predator, which is repeated several times. Alarm calls cause young to run to their parents, and cause the whole group to run to the nearest burrow or bolt hole (van Staaden, 1994). When directly threatened, the hair bristles, legs and tail extend, the head is lowered and the back arches. The meerkat growls and spits while rocking back and forth, and if the attack escalates, will lie on its back with teeth and claws presented and the nape protected (van Staaden, 1994).

Groups are highly territorial, and mark territories with urine and anal-gland secretions (van Staaden, 1994). Anal-gland secretions are applied at nose height by anal drag; cocking one leg while inverting the pouch and smearing the secretion onto the surface (Ewer, 1963). Although communal latrines may be used by the group, faeces is also used by dominant individuals to mark sleeping burrows and bolt holes (P.N.M. Pemberton; pers. comm. cited in Smithers & Chimimba, 2005).

Groups are ferociously hostile to other packs (van Staaden, 1994). When encountering another group, members advance on each other while adopting a bobbing action and tails held erect. Meerkats are highly aggressive towards rival groups, and individuals may be severely wounded or killed during fights (Smithers & Chimimba, 2005).



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### 3.8 NATURAL PREDATORS AND DISEASE

Meerkats have numerous predators in their natural habitat. The main predators are black-backed jackals (*Canis mesomelas*), martial eagles (*Polemaetus bellicosus*), tawny eagles (*Aquila rapax*), bateleur eagles (*Terathopius ecaudatus*) and pale-chanting goshawks (*Melierax canorus*). Other predators include bat-eared foxes (*Otocyon meglotis*), Cape foxes (*Vulpes chama*), lions (*Panthera leo*), leopards (*Panthera pardus*), cheetah (*Acinonyx jubatus*), caracal (*Felis caracal*), wild cat (*Felis lybica*) and honey badger (*Mellivora capensis*) (Smithers & Chimimba, 2005; Clutter-Brock et al. 1999a).

Potential predators in Tasmania include the Tasmanian devil (*Sarcophilus harrissii*), spotted-tailed quoll (*Dasyurus maculates*), large raptors such as wedge-tailed eagles (*Aquila audax fleayi*) and, should it become established, the introduced European red fox (*Vulpes vulpes*).

Parasites and disease also reduce meerkat survival. Meerkats are vulnerable to tick-borne diseases and also toxoplasmosis, a disease caused by the intestinal coccidian parasite *Toxoplasma gondii*. The parasite is distributed worldwide and is usually found in cats and other feline species but is also frequent among humans (Tenter et al. 2001; Juan-Salles et al. 1997). The disease has the potential to be fatal among meerkats and five of nine meerkats died in an outbreak of the disease at Barcelona Zoo in 1994 (Juan-Salles et al. 1997).

Meerkats are also vulnerable to rabies (Barnard, 1979). In the Free State, they are considered second in importance as a vector for rabies after the yellow mongoose (*Cynictis penicillata*) (Barnard, 1979). This rabies strain (known as 'herpestid' or 'viverrid' rabies) is found mainly in mongooses where it is well adapted. It can be transferred to dogs, jackals and foxes, even though it is not well adapted to these groups and does not usually spread between these animals (van Zyl et al. 2008; Bishop et al. 2003). Rabies is not currently found in Australia.

### 3.9 THREAT TO HUMAN SAFETY

Meerkats are not regarded as a serious threat to human safety. They are small, sociable animals which are not considered dangerous but may inflict minor physical injuries, with reports that meerkats may approach people and bite them (Perth Zoo, pers. comm. in Page *et al.* 2008). They are also easily tamed and are kept in homes in rural areas of South Africa to kill mice and rats (Nowak, 1991 in Van Staaden, 1994).

Meerkats have the potential to transmit toxoplasmosis to humans, although this is not considered to be a significant threat. The causative agent, *T. gondii*, is one of the more common parasites worldwide and is transmitted by the ingestion of infectious oocysts from the environment or by ingesting tissue cysts or tachyzoites contained in meat, blood, faeces and unpasteurised milk (Tenter *et al.* 2001). In pregnant females, the parasite can also be transferred to the foetus via the placenta (Tenter *et al.* 2001). Toxoplasmosis can be easily prevented and managed through appropriate hygiene methods such as washing hands and physical barriers to blood and faeces.

The rabies strain carried by meerkats has the potential to spread to dogs and humans but is different to the 'canid rabies' strain commonly associated with dogs (van Zyl *et al.* 2008). Barnard (1979) found that rabid meerkats were not very aggressive and relatively easy to control and that attacks on humans or other animals were not very successful. While Australia remains rabies-free, this disease is not an immediate threat to human safety. Rabies is a List A disease under the *Animal Health Act 1995* and does not occur in Tasmania.

### 3.10 HISTORY AS A PEST

Meerkats are not currently considered as a pest species. They have not established feral populations outside their native range (Macdonald & Hoffmann, 2008; Page *et al.* 2008) and are not recorded on the Global Invasive Species Database (Global Invasive Species Database, 2011). No introduction attempts have been noted.

There is no evidence of meerkats causing significant impacts on the environment or agriculture. Lynch (1980) argues that meerkats could alternatively benefit agriculture by controlling lepidopteran populations and consequently reducing damage to agricultural crops and pasture. Meerkats are capable of killing chickens and other poultry and could cause damage to the poultry industry (G. Davies, pers. comm.). There is also the potential for meerkats to cause damage through the consumption of fruit, vegetables, roots and tubers (van Staaden, 1994), but any notable impact has not been reported.

### 3.11 POTENTIAL IMPACT IN TASMANIA

In Tasmania, the meerkat is likely to occupy similar niches to those currently occupied by the eastern quoll (*Dasyurus viverrinus*), southern brown bandicoot (*Isodon obesulus*) and eastern barred bandicoot (*Perameles gunnii*). These three species are largely insectivorous, but the eastern quoll is most similar to the meerkat in that it opportunistically eats fruit and small vertebrates such as

rabbits, mice and rats (Bryant & Squires, 2009; Menkhorst & Knight, 2001). The eastern quoll also occupies underground burrows. Should the meerkat establish, direct competition is expected for burrowing habitat and diet between these species.

Meerkats could be expected to consume a variety of food sources, and suitable food items in Tasmania include invertebrates such as insects, arachnids and other arthropods, and vertebrates including small marsupials, lizards, snakes, amphibians and birds. Due to the diversity of their omnivorous diet, meerkats have the potential to negatively impact numerous Tasmanian species, including threatened species.

## 4. Risk Assessment

### 4.1 PREVIOUS RISK ASSESSMENTS

A previous risk assessment was conducted in 2008 by the Western Australian Department of Agriculture and Food. Page *et al.* (2008) conducted their risk assessment for meerkats using the 'Bomford model' which assesses the risk of exotic vertebrates to Australia as a whole (Bomford, 2008). The risk assessment concluded that meerkats be classified as a 'moderate' threat; a classification endorsed by the Vertebrate Pest Committee.

### 4.2 RISK ASSESSMENT

The following risk assessment determines the risk of meerkats to Tasmania using the Bomford model (2008) and proposes assigned threat categories and import classifications for the species.

| Species:  | Meerkat ( <i>Suricata suricatta</i> )               |  |
|---|---|--|
| Date of Assessment:   | March 2011  |  |
| Literature search type and date:  | See references                                      |  |
| Factor  | Score   |  |
| A1. Risk posed from individual escapees (0-2)   | 1   | <p><i>Animal that can make unproved attacks causing moderate injury (requiring medical attention) or severe discomfort but is highly unlikely (few if any records) to cause serious injury (requiring hospitalisation) if unprovoked.</i></p> <p>Meerkats are not regarded as dangerous but are capable of minor injuries and may approach people and bite them (Perth Zoo; pers. comm. cited in Page <i>et al.</i> 2008). They can carry a rabies strain (herpestid rabies) which can transfer to humans and canines. Attacks have been reported, although rabid animals are reasonably easy to contain (Barnard, 1979). Meerkats can transfer toxoplasmosis, although this disease is easily preventable and not considered serious.</p> |
| A2. Risk to public safety from individual captive animals (0-2)   | 0   | <p><i>Nil or low risk (highly unlikely or not possible).</i></p> <p>The risk to public safety from irresponsible use of products obtained from meerkats is low.</p>  |
| <b>Stage A. Risk posed by individual animals (risk that a captive or escape animal would harm people)</b> | <b>Public Safety Risk Score</b><br>= A1 + A2<br>= 1 | <b>Public Safety Risk Rank</b><br>A ≥ 2, Highly Dangerous<br>A = 1, Moderately Dangerous<br>A = 0, Not Dangerous<br>= Moderately Dangerous   |
| B1. Climate match score (1-6)   | 2   | <p><i>Low climate match score.</i></p> <p>Sum of squares for match classes 10 to 6: 1 (low).</p>   |

|   |   |   |
|---|---|---|
| B2. Exotic population established overseas score (0-4)  | 0   | No exotic populations ever established.<br>No meerkat populations are known to have established outside their native range (Macdonald & Hoffmann, 2008; Page et al. 2008).  |
| B3. Overseas range size score (0-2)   | 1   | Overseas range class of 1-70 million km <sup>2</sup> , with range estimated at 1.8 million km <sup>2</sup> (includes current and past 1000 years, natural and introduced range).<br>The meerkat is widely distributed throughout the Southern African subregion, occupying western and southern Namibia, south-western Botswana and north and west South Africa (Macdonald & Hoffmann, 2008). A narrow extension of distribution enters the Iona National Park in the extreme south-west of Angola (Smithers & Chimimba, 2005). |
| B4. Taxonomic class score (0-1)   | 1   | Mammal.   |
| <b>Stage B. Likelihood of establishment (risk that a particular species will establish a wild population in Tasmania)</b> | <b>Establishment Risk Score</b><br>= B1 + B2 + B3 + B4<br>= 4 | <b>Establishment Risk Rank</b><br>B = 11-13, Extreme<br>B = 9-10, High<br>B = 6-8, Moderate<br>B ≤ 5, Low<br>= Low  |
| C1. Taxonomic group (0-4)   | 2   | Mammal in one of the orders that have been demonstrated to have detrimental effects on prey abundance and/or habitat degradation (Carnivora).   |
| C2. Overseas range size (0-2)   | 0   | Overseas geographic range class less than 10 million square kilometres.<br>The range of meerkats is estimated at 1.8 million km <sup>2</sup> .  |
| C3. Diet and feeding (0-3)  | 1   | Mammal that is a non-strict carnivore (mixed animal-plant matter in diet).<br>Meerkats are primary insectivorous (insects compose 78% of the diet) (Doolan & Macdonald, 1996), however meerkats also eat spiders, scorpions, small vertebrates such as mice, birds, amphibians, snakes and lizards, and consume eggs, plant roots, fruits, seeds and tubers (van Staaden, 1994).  |
| C4. Competition for native fauna for tree hollows (0-2)   | 0   | Does not use tree hollows.  |
| C5. Overseas environmental pest status (0-3)  | 0   | Never reported as an environmental pest in any country or region.<br>No meerkat populations are known to have established outside their native range (Macdonald & Hoffmann, 2008; Page et al. 2008).  |
| C6. Climate match to areas with susceptible native species or communities (0-5)   | 4   | The species has 6 – 10 grid squares within the highest two climate match classes, and/or has 11 to 20 grid squares within the highest four climate match classes that overlap the distribution of any susceptible native species or   |

|   |  |  |
|---|--|--|
|   |  | <i>ecological communities; OR 50% of the geographic range of one or more susceptible native species or ecological communities that are listed as threatened under Tasmanian legislation lies within the mapped area of the six climate match classes (10, 9, 8, 7, 6, and 5) = 4</i>   |
| C7. Overseas primary production (0-3)   | 1  | <i>Minor pest of primary production in any country or region. Meerkats may impact poultry industries by killing chickens (G. Davies, pers. comm.).</i>   |
| C8. Climate match to susceptible primary production (0-5)   | 1  | <i>Low (the species has attributes making it capable of damaging this or a similar commodity, and has had the opportunity, but there are no reports or other evidence that it has caused damage in any country or region).<br/><br/>There is the potential for meerkats to kill chicken and consume eggs, fruit, vegetables, roots and tubers (van Staaden, 1994), but any notable impact has not been reported (see Appendix A).</i>                    |
| C9. Spread disease (1-2)  | 2  | <i>All mammals and birds (likely or unknown effect on native species and on livestock and other domestic animals).</i>   |
| C10. Harm to property (0-3)   | 0  | <i>Total annual dollar value of damage if the exotic species established throughout the area which it has a climate match within the highest six classes (classes 10 to 5): \$0.</i>   |
| C11. Harm to people (0-5)   | 2  | <i>Low; injuries, harm or annoyance likely to be minor and few people exposed.<br/><br/>Meerkats have the potential to cause harm to people through biting and the transmission of herpestid rabies and toxoplasmosis. Any injuries or harm are likely to be minor. Rabid meerkats are not very aggressive and relatively easy to control (Barnard, 1979) and toxoplasmosis can be easily prevented and managed through appropriate hygiene methods.</i> |
| <b>Stage C. Consequence of Establishment (risk that an established population would cause harm)</b> | <b>Consequence Risk Score</b><br>= sum of C1 to C11<br>= 13                              | <b>Consequence Risk Ranking</b><br>C > 19, Extreme<br>C = 15-19, High<br>C = 9-14, Moderate<br>C < 9, Low<br>= Moderate  |
| <b>ASSIGNED THREAT CATEGORY:</b>  | <b>MODERATE</b>  |  |
| <b>PROPOSED IMPORT CLASSIFICATION:</b>  | <b>IMPORT RESTRICTED TO LICENSE HOLDERS APPROVED FOR KEEPING MODERATE THREAT SPECIES</b> |  |

## 5. Risk Management

This risk assessment concludes that the meerkat (*Suricata suricatta*) are a moderate threat to Tasmania and that imports be restricted to those license holders approved for keeping moderate threat species. On the basis of this risk assessment, it is recommended that the meerkat (*Suricata suricatta*) be placed on the list of imports permitted with conditions.

As defined under the *Policy and Procedures for the Import, Movement and Keeping of Vertebrate Wildlife in Tasmania* (DPIPWE 2011), the following mandatory conditions will apply to the import and keeping of this species. Additional conditions may be required.

1. The animal must not be released, or be allowed to escape from effective control.
2. Specimens seized or forfeited as a result of illegal or accidental introductions, where rehousing is not available, will be humanely euthanized.
3. Animal welfare requirements under the *Animal Welfare Act 1993* and any approved Code of Practice or Management Plan must be met.
4. Import only permitted by holders approved to keep the species under a wildlife exhibition licence. The licence will specify a number of conditions.
5. Individuals to be micro-chipped or otherwise identified, or treated to allow identification.
6. Facility must meet minimum standards for welfare and security.
7. Facility must be available for inspection at any reasonable time.
8. Audits of facilities and collections.
9. The maximum number of individuals of a species held at the facility to be stipulated on the licence, taking into account relevant factors. Gender may also be stipulated.
10. Written approval prior to movement of animals between facilities and trade of species under licence.
11. Record keeping and reporting to DPIPWE as required by DPIPWE.
12. Collections containing species subject to approval by DPIPWE as meeting best practice for keeping the species concerned.

## 6. References

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## 7. Appendices

### APPENDIX A: CALCULATING TOTAL COMMODITY DAMAGE SCORE

| Column 1  | Column 2                           | Column 3  | Column 4  | Column 5  |
|---|------------------------------------|---|---|---|
| <b>Industry</b>   | <b>Commodity Value Index (CVI)</b> | <b>Potential Commodity Impact Score (PCIS, 0-3)</b> | <b>Climate Match to Commodity Score (CMCS, 0-5)</b> | <b>Commodity Damage Score (CDS columns 2 x 3 x 4)</b> |
| <b>Cattle (includes dairy and beef)</b>                         | 11                                 | N/A   |   |   |
| <b>Timber (includes native and plantation forests)</b>          | 10                                 | N/A   |   |   |
| <b>Aquaculture</b>  | 6                                  | N/A   |   |   |
| <b>Sheep (includes wool and meat)</b>                           | 5                                  | N/A   |   |   |
| <b>Vegetables</b>   | 5                                  | N/A   |   |   |
| <b>Fruit (includes wine grapes)</b>                             | 5                                  | N/A   |   |   |
| <b>Poultry (including eggs)</b>                                 | 1.5                                | 2   | 2   | 6   |
| <b>Cereal grain (includes wheat, barley, sorghum etc)</b>       | 1                                  | N/A   |   |   |
| <b>Other crops and horticulture (includes nuts and flowers)</b> | 1                                  | N/A   |   |   |
| <b>Pigs</b>   | 1                                  | N/A   |   |   |
| <b>Bees (includes honey, beeswax, and pollination)</b>          | 0.5                                | N/A   |   |   |
| <b>Oilseeds (includes canola, sunflower etc)</b>                | 0.5                                | N/A   |   |   |
| <b>Grain legumes (includes soybeans)</b>                        | 0.3                                | N/A   |   |   |
| <b>Other livestock (includes goats and deer)</b>                | 0.3                                | N/A   |   |   |
| <b>Total Commodity Damage Score (TCDS)</b>                      |                                    |   |   | 6   |

## APPENDIX B: ASSIGNING SPECIES TO THREAT CATEGORIES

| A: Danger posed by individual animals (risk a captive or escaped individual would harm people) | B: Likelihood of establishment (risk that a particular species will establish a wild population in Tasmania) | C: Consequence of establishment (risk that an established population would cause harm) | Threat category                | Implications for any proposed import into Tasmania                               |
|--|--|--|--------------------------------|--|
| Highly, Moderately or Not Dangerous  | Extreme  | Extreme  | Extreme                        | Prohibited   |
| Highly, Moderately or Not Dangerous  | Extreme  | High   |                                |  |
| Highly, Moderately or Not Dangerous  | Extreme  | Moderate   |                                |  |
| Highly, Moderately or Not Dangerous  | Extreme  | Low  |                                |  |
| Highly, Moderately or Not Dangerous  | High   | Extreme  |                                |  |
| Highly, Moderately or Not Dangerous  | High   | High   |                                |  |
| Highly, Moderately or Not Dangerous  | Moderate   | Extreme  |                                |  |
| Highly, Moderately or Not Dangerous  | High   | Moderate   | Serious                        | Import restricted to license holders approved for keeping serious threat species |
| Highly, Moderately or Not Dangerous  | High   | Low  |                                |  |
| Highly, Moderately or Not Dangerous  | Moderate   | High   |                                |  |
| Highly Dangerous   | Moderate   | Moderate   |                                |  |
| Highly Dangerous   | Moderate   | Low  |                                |  |
| Highly, Moderately or Not Dangerous  | Low  | Extreme  |                                |  |
| Highly, Moderately or Not Dangerous  | Low  | High   |                                |  |
| Highly Dangerous   | Low  | Moderate   |                                |  |
| Highly Dangerous   | Low  | Low  |                                |  |
| Moderately or Not Dangerous  | Moderate   | Moderate   |                                |  |
| Moderately or Not Dangerous  | Moderate   | Low  |                                |  |
| Moderately or Not Dangerous  | Low  | Moderate   |                                |  |
| Moderately Dangerous   | Low  | Low  |                                |  |
| Not Dangerous  | Low  | Low  | Low                            | Import Permitted   |
| Unknown  | Any value  | Any value  | Extreme until proven otherwise | Prohibited   |
| Any Value  | Unknown  | Any value  |                                |  |
| Any Value  | Any value  | Unknown  |                                |  |
| Unassessed   | Unassessed   | Unassessed   |                                |  |

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