

PEST RISK ASSESSMENT

Black-tufted capuchin monkey

Cebus apella



(Photo: courtesy of Charles J. Sharp. Image from Wikimedia Commons under a Creative Commons Attribution License, Version 3.)

March 2011

© Department of Primary Industries, Parks, Water and Environment 2011

Information in this publication may be reproduced provided that any extracts are acknowledged.

This publication should be cited as:

DPIPWE (2011) Pest Risk Assessment: Black-tufted capuchin monkey (*Cebus paella*). Department of Primary Industries, Parks, Water and Environment. Hobart, Tasmania.

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.

For more information about this Pest Risk Assessment, please contact:

Wildlife Management Branch

Department of Primary Industries, Parks, Water and Environment

Address: GPO Box 44, Hobart, TAS. 7001, Australia.

Phone: 1300 386 550

Email: wildlife.reception@dpiuwe.tas.gov.au

Visit: www.dpiuwe.tas.gov.au

Disclaimer

The information provided in this Pest Risk Assessment is provided in good faith. The Crown, its officers, employees and agents do not accept liability however arising, including liability for negligence, for any loss resulting from the use of or reliance upon the information in this Pest Risk Assessment and/or reliance on its availability at any time.

I. Summary

The black-tufted capuchin monkey (*Cebus apella*) is a member of the Cebid monkey family (Cebidae), which includes capuchin and squirrel monkeys. They are medium-sized, omnivorous monkeys, native to tropical and sub-tropical South America. They are not known to have naturalised outside this range. As a result, there are no reported consequences of establishment, although the impact on Tasmanian fauna through diet and competition could be significant. Capuchins also have the potential to cause damage to agriculture, and have the capacity to carry significant human diseases.

The black-tufted capuchin is considered a 'serious' threat under the Vertebrate Pest Committee's threat categorisation and is a 'controlled animal' under the Tasmanian *Nature Conservation Act 2002*. This risk assessment concludes that black-tufted capuchin 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: Primates
Family: Cebidae
Genus: Cebus
Species: *C. apella* (Linnaeus, 1758)

Sub-species: *C. apella apella* (Linnaeus, 1758); *C. apella fatuellus* (Linnaeus, 1766); *C. apella macrocephalus* (Spix, 1823); *C. apella peruanus* (Thomas, 1901); *C. apella tocaninus* (Lönnerberg, 1939); *C. apella margaritae* (Hollister, 1914) (Rylands et al. 2005).



Photo courtesy of Frans de Waal. Image from Wikimedia Commons under a Creative Commons Attribution License, Version 2.5.)

Common names (including industry or trade names): tufted capuchin, brown capuchin, black-capped capuchin, Guianan / Margarita Island brown capuchin, black-capped capuchin, Margarita Island capuchin.

Known hybrids: Natural hybrids of *C. apella* and other capuchin species (*C. albifrons*, *C. capucinus* and *C. olivaceus* are known to occur (Torres de Caballero, 1976). Hybridisation for the pet trade is considered common (Cebalus-Mago et al. 2010).

Close relatives: Other Cebidae include the black-striped capuchins (*C. libidinosus libidinosus*, *C. libidinosus pallidus*, *C. libidinosus paraguayanus*, *C. libidinosus juruanus*); the black capuchins (*C. nigrinus nigrinus*, *C. nigrinus robustus*, *C. nigrinus cucullatus*); the golden-bellied capuchin (*C. xanthosternus*) and the blond capuchin (*C. flavus*). Other members of the Cebidae family are the white-fronted capuchin (*C. albifrons*), the white-headed capuchin (*C. capucinus*), the weeper capuchin (*C. olivaceus*) and the Kaapori capuchin (*C. kaapori*).

2.2 DESCRIPTION

The black-tufted capuchin is a medium-sized arboreal primate. It is recognized by its characteristic head coloration, a black or dark brown cap with dark sideburns. On either side of the dark cap on the head there are tufts of dark fur. The shoulders are paler than the back, which ranges from shades of yellow to red-brown, darkest in the middle of the back. The legs, hands, and tail are darker than the rest of its fur. The face can range from brown to pink (Groves, 2001 cited in Gron, 2009). There is significant variation in face colour, even among members of the same group but adult males tend to be darker than females (Emmons & Freer, 1997 cited in Gron, 2009).

Adult males have an average head-body length of 444mm; females average 390mm. The tail length is very similar to the length of the body. The tail is relatively short and thick; it assists stability and the ability to change direction. Wild adult males average 3.65kg, and wild adult females average 2.52kg. Captive capuchins may be considerably heavier, with males averaging 6.09kg and females 3.19kg (Jack, 2007).

2.3 CONSERVATION AND LEGAL STATUS

CONSERVATION STATUS

Black-tufted capuchin monkeys are currently listed as a species of 'least concern' under the IUCN Red List (Rylands *et al.* 2008).

LEGAL STATUS

Under the *Environment Protection and Biodiversity Conservation Act 1999*, black-tufted capuchin monkeys are listed as 'specimens taken to be suitable for live import' and require a 'permit to import' issued under this Act. Permits may be issued for non-commercial purposes only (i.e. zoos) and exclude household pets.

Black-tufted capuchin monkeys are 'controlled animals' under the *Tasmanian Nature Conservation Act 2002*.

Black-tufted capuchin monkeys are listed on Appendix II of CITES.

3. Biology and Ecology

3.1 LIFE HISTORY

In capuchin populations most males can potentially mate with most females, but under certain conditions only the alpha male will mate. Unusually, females initiate mating and the choice of mate (Carosi *et al.* 2005).

Oestrus may last from one to eight days but typically lasts around five days. In addition, oestrus does not show any strict seasonality although it is more common in some times of the year than others and conceptions are somewhat synchronous among females. Birth season varies by locale and reflects the differential rainfall, food availability and photoperiod of the habitat (Carosi *et al.* 2005).

Average gestation in captivity is 153 days but can range from 149-158 days. In the wild, females attain reproductive maturity at around four years of age but in captivity this number is around five years. In captivity, males are fertile by about four and a half years of age (Fragaszy & Adams-Curtis, 1998; Carosi *et al.* 2005).

Females bear one young (twin births have been recorded) every two years. The average weight of a captive tufted capuchin at birth is 210 g. At birth and for the subsequent three weeks in the wild, the infant will cling dorsally to its mother and not move independently. In addition, for the first two weeks of life in the wild, the majority of the mother's resting time is spent suckling and grooming the infant. After the fourth week of life, 20-70% of the infant's time is spent with other capuchins of all demographics, which is an indicator of strong group cohesion. Carrying by other group members occurs predominantly while the mother feeds and while the group is moving. By the third month, infants move independently except in situations in which the group must move very quickly (Valenzuela, 1994). As wild infant capuchins gain independence and are capable of solitary movement, they typically gravitate toward and stay near the alpha male. The affiliative bond of the infant with the alpha male is stronger and more evident than with subordinate group males (Gron, 2009).

Because females produce offspring only about once every two years, it is assumed that complete weaning takes place into the second year as having a dependent infant precludes reproduction at the one year mark (Gron, 2009). Wild weaning has been estimated at around 16.5 months and captive weaning at 13.7 months (Fragaszy & Adams-Curtis, 1998).

While development in captivity is better recorded than in the wild, it is suggested that infants develop faster in wild populations because of the added difficulties of a wild existence (Gron, 2009). By one year of age, fine motor control is almost completely developed at the adult level and by 15 months of age, truly independent foraging is seen (Fragaszy & Adams-Curtis, 1998).

In captivity, individuals have reached an age of 45 years, although life expectancy for individuals in wild populations is only 15 to 25 years (Gron, 2009).

3.2 HABITAT REQUIREMENTS AND PREFERENCES

The black-tufted capuchin monkey inhabits a wide variety of tropical and sub-tropical vegetation communities, and is flexible in its choice of habitat (Rylands *et al.* 2008). It is common in a wide range of forest and woodland habitat types including high rain forest, low rain forest, riverbank high

forest, mountain savannah forest, liana forest, marsh forest and mangrove forest (Rylands *et al.* 2008). They are typically found in the lower to mid-canopy and understorey (Fragaszy *et al.* 2004).

Near the eastern end of the tufted capuchin range in French Guiana, there is an annual dry season from August to November and a long rainy season punctuated in February and March by a short dry spell. Annual precipitation averages 3000 mm and temperatures range from 22.0°C to 31.2°C (Gron, 2009). In the middle of the tufted capuchin range, near Manaus, Brazil in dense forest, mean average rainfall is 2,673 mm. This area exhibits a wet season from December to May and a dry season during the rest of the year. Temperatures range from 21°C to 33.5°C (Gron, 2009). Near the western extreme of the tufted capuchin range in moist tropical forest in south eastern Peru, the dry season ranges from June to October and rainfall averages around 2000 mm (78.74 in) with an average temperature of 24.1°C (Gron, 2009).

The altitude at which tufted capuchins are found can vary considerably with the species having been seen as high as 2,350 m in the Peruvian highlands (Gron, 2009).

Tufted capuchins spend the night in tall trees, chosen for their security, comfort level and appropriateness for social contact (Gron, 2009). Typically the sleeping site will be located near the centre of the group's home range but tends to be the appropriate site closest to where they were last foraging rather than a specific preferred site. The sleeping site changes frequently, but a single site can be reused (Gron, 2009).

3.3 NATURAL GEOGRAPHIC RANGE

The tufted capuchin has the largest range of all of the New World primates (Gron, 2009). The tufted capuchin is only found in South America, in the countries of Colombia, Ecuador, Peru, Bolivia, Brazil, French Guiana, Suriname, Guiana, and Venezuela – Figure 1 (Fragaszy *et al.* 2004). The Margarita island tufted capuchin (*C. a. margaritae*) – a subspecies of the tufted capuchin, occurs on an island off the coast of Venezuela, and is separated from the nearest mainland population by around 800 km (Fragaszy *et al.* 2004).

The heart of the range of the tufted capuchin is the northwestern half of Brazil and the Amazon basin, extending as far west as the eastern foothills of the Andes mountain chain south into Peru. The southern limit in Brazil appears to be limited by the bush savannah of central Brazil (Rylands *et al.* 2005).

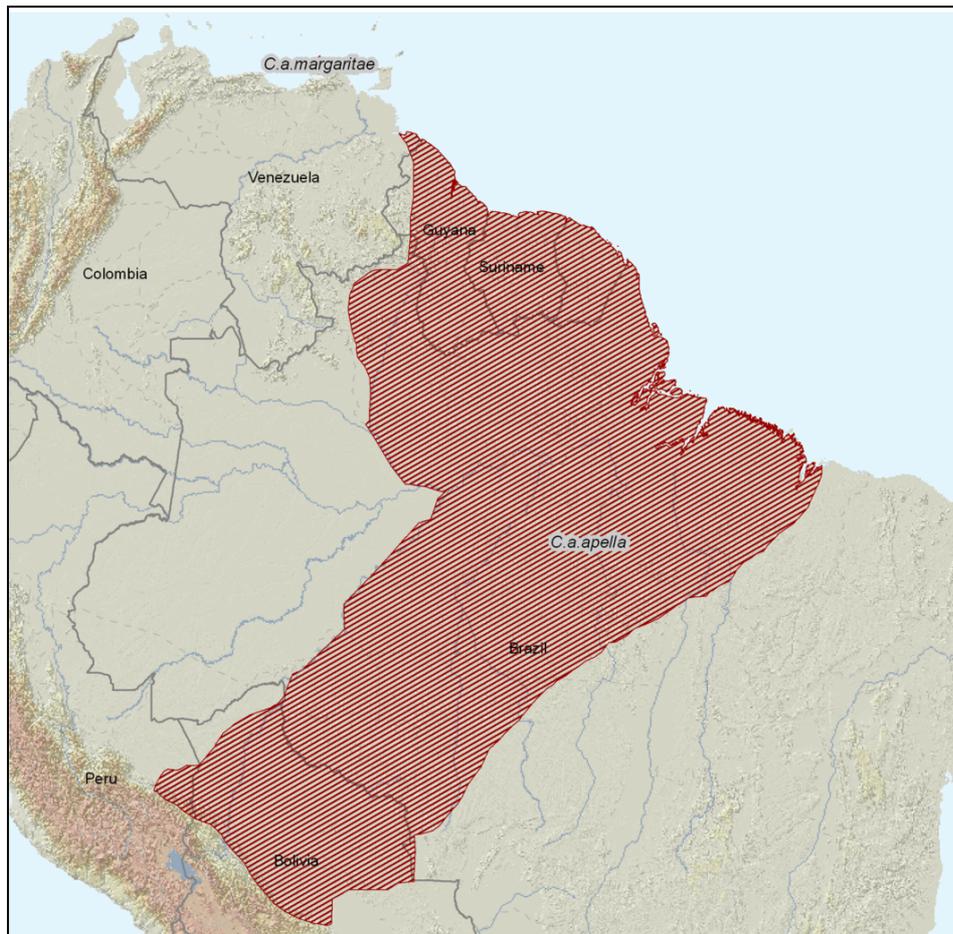


Figure 1. Native resident range of the black-tufted capuchin (*Cebus apella*) in South America (modified from Rylands *et al.* 2008).

3.4 INTRODUCED GEOGRAPHIC RANGE

There is no evidence of black-tufted capuchins establishing feral (non-naturally occurring) populations outside their native range (Gron, 2009). 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, a climate comparison between the species' current distribution and potential Australian distribution is shown in Figure 2. Modelling indicates that Australia has areas of similar climate that may support the establishment of introduced black-tufted capuchin populations. Tasmania's climate is not suitable (highest climate match score: 0).

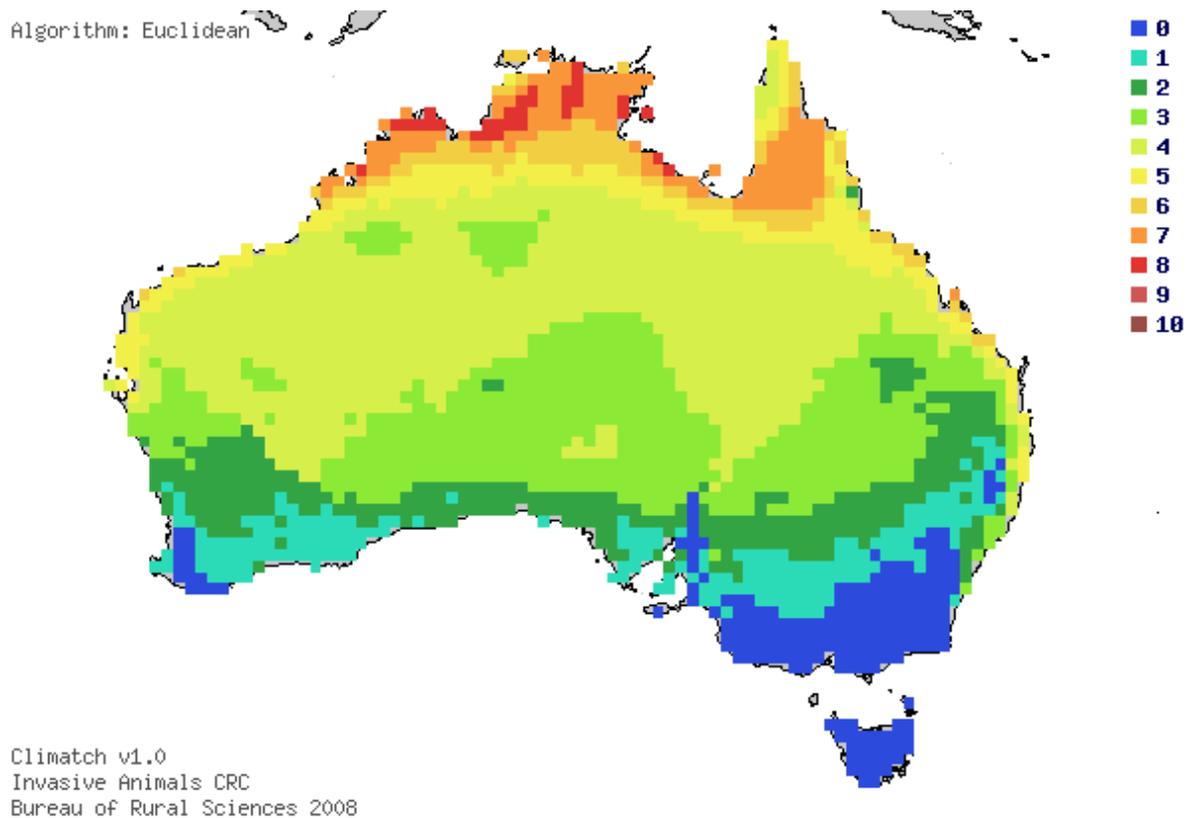


Figure 2. Climate comparison between the natural range of *C. apella* and Australia, where 10 is a 'perfect' climate match and 0 is having a very dissimilar climate. Tasmania shows a match of 0.

3.6 DIET AND FEEDING BEHAVIOUR

The black-tufted capuchin is omnivorous, its diet containing fruits, insects, leaves, nectar, nuts, and pith, the relative proportions of which vary considerably with habitat and the seasons (Gron, 2009). Foods exploited by tufted capuchins vary widely with habitat as well as with the seasons. In the dry season, when food is often scarce, the tufted capuchin relies on palm nuts and pith. Animal prey of the tufted capuchin includes a large variety of insects in addition to vertebrates such as frogs, lizards and birds (Gron, 2009). It is also a confirmed predator of titi monkeys (*Callicebus moloch*).

The black tufted capuchin is diurnal, and typically divides its daytime activities into 12% rest, 21% travel and 66% feeding (Gron, 2009). Time spent in different daily activities varies with the seasons and locality (Gron, 2009).

Capuchins spend most of the day foraging in groups for food, with a rest in the middle of the day. Groups sometimes split into subgroups and forage on their own in different directions. Depending on habitat, home range size of the tufted capuchin ranges from 0.5km² (Robinson & Janson, 1986 cited in Gron 2009) to 9km² (Spironello, 2001 cited in Gron, 2009). Average daily travel distance for a tufted capuchin is around 2.1 km (Janson in prep. cited in Robinson & Janson, 1986 cited in Gron, 2009).

Wild tufted capuchins are capable of using tools to open up otherwise inaccessible fruits, the husks of which it cannot open in its teeth or jaws. It opens fruits by smashing them on tree surfaces or by using baton-like branch pieces to open the fruit. Immature tufted capuchins have been observed

attempting to mimic the behaviour of adults but they often fail (Boinski *et al.* 2000 cited in Gron, 2009).

3.7 SOCIAL BEHAVIOUR AND GROUPINGS

Tufted capuchin social organization is characterized by discrete hierarchies of rank between both sexes and different age classes. Both male and female rank hierarchies are correlated with age, with the older individuals typically being higher ranked than younger individuals (Izawa, 1980 cited in Gron, 2009). Tufted capuchin groups are often small, numbering in the teens or lower twenties with only one to several adult males and around the same number of adult females (Izawa, 1980; Defler, 1982). Groups may split when troop size reaches about 20. Troops may have overlapping territories, and when different groups encounter one another, interactions range from peaceful curiosity and tolerance of the other group to active chasing away by adult males (Spironello, 2001 cited in Gron, 2009).

Both sexes take up linear hierarchies, the top ranking male being dominant to the top ranking female (Fragaszy *et al.* 2004 cited in Gron, 2009). The alpha male dictates group movement and activity patterns, is the focal point of group attention and functions in group cohesion. With the exception of young males, who often transfer between groups several times before settling into a new troop, group membership is stable over a number of years (Gron, 2009). The tufted capuchin dominance hierarchy serves to regulate social spacing during group foraging and thus is reflected in access to high-quality foods. Higher-ranking individuals are better placed during social foraging to attain the best and largest amounts of resources while lower-ranking individuals are marginalized. Females usually stay within their natal group excepting the occasional adult female who may migrate between troops. The earliest age at which a male emigrates from his natal group is at 6 years of age (Robinson & Janson, 1986 cited in Gron, 2009).

Adult tufted capuchin males are more likely to exhibit anti-predator vigilance to protect other age and sex classes from threats and are also far better than the other classes at detecting potential threats (van Schaik & van Noordwijk, 1989 cited in Gron, 2009). Lower-ranking males tend to avoid higher-ranking males in day-to-day activities but there are strong bonds between different males nevertheless (Izawa, 1980 cited in Gron, 2009).

Capuchins have been the subject of considerable study as they appear capable of developing social traditions, have shown a capacity to use tools when foraging, and have demonstrated learning skills comparable to chimpanzees.

3.8 NATURAL PREDATORS AND DISEASE

The main predator of the tufted capuchin is the harpy eagle (*Harpia harpyja*), (Rettig, 1978; Terborgh, 1983; van Schaik & van Noordwijk, 1989 cited in Gron, 2009). Other potential predators include jaguars, pumas, jaguarundis, coyotes, tayras, snakes and crocodiles, although these are not confirmed (Fragaszy *et al.* 2004 cited in Gron, 2009).

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

Capuchin monkeys are prone to significant infestation of internal gastro-intestinal parasites in both the wild and in captivity. Many of these parasites may be transmitted to humans (Fragaszy *et al.* 2004 cited in Gron, 2009).

3.9 THREAT TO HUMAN SAFETY

Black-tufted capuchins are not regarded as a serious threat to human safety. However, they are capable of unprovoked attacks, and their sharp teeth may cause injuries requiring medical care.

Capuchins have the capacity to transmit a number of diseases to humans. An analysis of potential zoonotic disease transmission as a result of the wildlife trade in the United States concluded that *Cebus* species posed a known risk for three significant diseases: Cercopithecine herpesvirus-1 (herpes B), Yellow fever virus, and *Mycobacterium tuberculosis* complex (Pavlin *et al.* 2009). An additional four significant diseases were considered to be risk zoonoses based on the fact that these diseases occur within the *Cebidae* family: Lymphocytic choriomeningitis virus, Rabies viruses, Monkeypox virus, *Francisella tularensis* (Pavlin *et al.* 2009).

Of these diseases, only Cercopithecine herpesvirus-1 (herpes B) is known to be present in Tasmania, where it occurs in a captive population of Japanese macaques (*Macaca fuscata*) (M L Conway, pers. comm. 2011).

Infection with herpes B virus is extremely rare in humans; however, when it does occur, the infection can result in severe neurologic impairment or fatal encephalomyelitis if the patient is not treated soon after exposure (Pavlin *et al.* 2009).

In addition to herpes B, capuchin monkeys have recently been shown to be susceptible to leptospirosis (Szonyi *et al.* 2010). Leptospirosis is a bacterial zoonotic disease, capable of causing meningitis, liver and renal failure in humans if not treated. It is spread by contact with infected body fluids, or water containing infected body fluids. It is considered rare in monkeys, but has caused significant mortality in a captive population where rodent infestation was the confirmed cause of the outbreak (Szonyi *et al.* 2010). Although the extent of *Leptospira* transmission between humans and monkeys is unknown there is concern that improper husbandry of non-human primates could create new reservoirs and transmission routes for *Leptospira* threatening conservation efforts and public health (Szonyi *et al.* 2010). *Leptospira* bacteria are present in Tasmania and therefore an escaped population of capuchin monkeys could spread leptospirosis, although this is unlikely to significantly increase the existing risk (M L Conway, pers. comm. 2011).

3.10 HISTORY AS A PEST

Capuchins are considered a pest in tropical conifer plantation forestry. In Brazil the black-tufted capuchin feeds on the bark of the introduced species *Pinus taeda* and *P. elliottii*. Feeding often ring barks and kills the upper crowns of pines. Similar damage has been observed in plantations of the Brazilian conifer, *Araucaria angustifolia* (FAO, 2007)

Capuchins will feed on agricultural crops – including orchard fruits, sugar cane, maize and cassava – particularly where their habitat has been fragmented or where natural fruit sources are low (Rocha *et al.* 2007; de Freitas *et al.* 2008)

3.11 POTENTIAL IMPACT IN TASMANIA

In Tasmania, the black-tufted capuchin is unlikely to survive in the wild. However, its diet could potentially make it a competitor with opportunistic omnivores such as 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 will also eat fruit and small vertebrates such as rabbits, mice and rats (Bryant & Squires, 2009; Menkhorst & Knight, 2001).

Due to the diversity of their omnivorous diet, black-tufted capuchins have the potential to negatively impact numerous Tasmanian species, including threatened species.

Capuchins could also be a nuisance species in orchards and horticulture. Their potential to damage temperate coniferous species, including those used in plantation forestry, is unknown.

4. Risk Assessment

4.1 PREVIOUS RISK ASSESSMENTS

A risk assessment using the 'Bomford model', which assesses the risk of exotic vertebrates to Australia as a whole (Bomford, 2008), has been undertaken on behalf of the Vertebrate Pest Committee. The assessment concluded that the black-tufted capuchin should be classified as a "serious" threat, and that

... these animals may be introduced and/or should be kept only in collections approved by the relevant State/Territory authority as being primarily kept for (1) public display and education purposes, and/or for (2) genuine scientific research approved by the relevant State/Territory authority, and as meeting Best Practice for the purposes of keeping the species concerned (VPC, 2007).

4.2 RISK ASSESSMENT

The following risk assessment determines the risk of black-tufted capuchins to Tasmania using the Bomford model (2008) adapted for use in Tasmania and proposes assigned threat categories and import classifications for the species.

Species:	Black-tufted capuchin monkey (<i>Cebus apella</i>)	
Date of Assessment:	March 2011	
Literature search type and date:	See references	
Factor	Score	
A1. Risk posed from individual escapees (0-2)	1	<i>Animal that can make unprovoked 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> Black-tufted capuchins are not regarded as dangerous but are capable of minor injuries. They can carry the diseases Cercopithecine herpesvirus-1 (herpes B) and leptospirosis. Both diseases may be serious if contracted by humans, but it assumed this risk is managed prior to entry.
A2. Risk to public safety from individual captive animals (0-2)	0	<i>Nil or low risk (highly unlikely or not possible).</i> The risk to public safety from irresponsible use of products obtained from capuchins is low.
Stage A. Risk posed by individual animals (risk that a captive or escape animal would harm people)	Public Safety Risk Score = A1 + A2 = 1	Public Safety Risk Rank A ≥ 2, Highly Dangerous A = 1, Moderately Dangerous A = 0, Not Dangerous = Moderately Dangerous
B1. Climate match score (1-6)	1	<i>Very Low climate match score.</i> Sum of squares for match classes 10 to 6: 0 (very low).
B2. Exotic population established	0	<i>No exotic populations ever established.</i>

overseas score (0-4)		No black-tufted capuchin populations are known to have established outside their native range (Gron, 2009).
B3. Overseas range size score (0-2)	1	Overseas range class of 1-70 million km ² , with range estimated at 5 million km ² (includes current and past 1000 years, natural and introduced range). The black-tufted capuchin is widely distributed throughout the Amazonian basin; a disjunct population occurs on the Venezuelan island of Margarita.
B4. Taxonomic class score (0-1)	1	Mammal.
Stage B. Likelihood of establishment (risk that a particular species will establish a wild population in Tasmania)	Establishment Risk Score = B1 + B2 + B3 + B4 = 3	Establishment Risk Rank B = 11-13, Extreme B = 9-10, Serious B = 6-8, Moderate B ≤ 5, Low = Low
C1. Taxonomic group (0-4)	0	Not in one of the mammal orders that have been demonstrated to have detrimental effects on prey abundance and/or habitat degradation.
C2. Overseas range size (0-2)	0	Overseas geographic range class less than 10 million square kilometres. The range of black-tufted capuchins is estimated at 5 million km ² .
C3. Diet and feeding (0-3)	1	Mammal that is a non-strict carnivore (mixed animal-plant matter in diet). Black-tufted capuchins are omnivorous, with a diet that consists of fruits, insects, leaves, nectar, nuts, and pith. Black-tufted capuchins also eat small vertebrates such as birds, amphibians, lizards, and small primates (Gron, 2009).
C4. Competition for native fauna for tree hollows (0-2)	0	Does not use tree hollows. Black-tufted capuchins do not use tree hollows but instead sleep in the forks of large trees (Gron 2009).
C5. Overseas environmental pest status (0-3)	0	Never reported as an environmental pest in any country or region. No black-tufted capuchins populations are known to have caused environmental harm.
C6. Climate match to areas with susceptible native species or communities (0-5)	0	The species has 0 grid squares within the highest two climate match classes, and/or has 0 grid squares within the highest four climate match classes that overlap the distribution of any susceptible native species or 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
C7. Overseas primary production (0-3)	1	Minor pest of primary production in any country or region. Black-tufted capuchins may impact tropical plantation forestry and horticulture
C8. Climate match to susceptible primary production (0-5)	0	Less than 1% of the commodity is produced in areas where the species has a climate match within the highest eight climate match classes (ie classes 10,9,8,7,6,5,4 and 3) = 0.
C9. Spread disease (1-2)	2	All mammals and birds (likely or unknown effect on native species and on livestock and other domestic animals).
C10. Harm to property (0-3)	0	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. No climate match.
C11. Harm to people (0-5)	2	Low; injuries, harm or annoyance likely to be minor and few people exposed. Black-tufted capuchins have the potential to cause harm to people through biting and the transmission of disease. Any injuries or harm are likely to be minor.
Stage C. Consequence of Establishment (risk that an established population would cause harm)	Consequence Risk Score = sum of C1 to C11 = 6	Consequence Risk Ranking C > 19, Extreme C = 15-19, Serious C = 9-14, Moderate C < 9, Low = Low
ASSIGNED THREAT CATEGORY:	MODERATE	
PROPOSED IMPORT CLASSIFICATION:	IMPORT RESTRICTED TO THOSE LICENSE HOLDERS APPROVED FOR KEEPING MODERATE THREAT SPECIES	

5. Risk Management

This risk assessment concludes that Black-tufted capuchin (*Cebus apella*) 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 Black-tufted capuchin 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.
1. Specimens seized or forfeited as a result of illegal or accidental introductions, where rehousing is not available, will be humanely euthanized.
2. Animal welfare requirements under the *Animal Welfare Act 1993* and any approved Code of Practice or Management Plan must be met.
3. Import only permitted by holders approved to keep the species under a wildlife exhibition licence. The licence will specify a number of conditions.
4. Individuals to be micro-chipped or otherwise identified, or treated to allow identification.
5. Facility must meet minimum standards for welfare and security.
6. Facility must be available for inspection at any reasonable time.
7. Audits of facilities and collections.
8. 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.
9. Written approval prior to movement of animals between facilities and trade of species under licence.
10. Record keeping and reporting to DPIPWE as required by DPIPWE.
11. Collections containing species subject to approval by DPIPWE as meeting best practice for keeping the species concerned.

6. References

- Bomford, M. (2008). *Risk assessment models for establishment of exotic vertebrates in Australia and New Zealand*. Report prepared for the Invasive Animals Cooperative Research Centre.
- Bryant, S. & Squires, T. (2009). *Animals of Tasmania, wildlife of an incredible island*. Quintus Publishing, Tasmania.
- Carosi, M., Linn, G.S., Visalberghi, E (2006). The sexual behaviour and breeding system of tufted capuchin monkeys (*Cebus apella*), *Advances in the Study of Behaviour* (35): 105-149.
- Ceballos-Mago, N., González, C.E., Chivers, D.J. (2010). Impact of the pet trade on the Margarita capuchin monkey *Cebus apella margaritae*, *Endangered Species Research* (12): 57-68.
- de Freitas; C.H., Setz; E.Z.F., Araújo; A.R.B., Gobbi, N. (2008). Agricultural crops in the diet of bearded capuchin monkeys, *Cebus libidinosus* Spix (Primates: Cebidae), in forest fragments in southeast Brazil, *Revista Brasileira de Zoologia* (25:1), Curitiba.
- Forestry Department. (2007.) *Overview of Forest Pests Brazil*, United Nations Food and Agriculture Organisation, Rome.
- Fragaszy DM, Adams-Curtis LE. 1998. Growth and reproduction in captive tufted capuchins (*Cebus apella*). *American Journal of Primatology*, 44(3):197-203.
- Global Invasive Species Database. <<http://www.issg.org/database>> (Accessed 4 January 2011).Gron KJ. 2009 April 17. Primate Factsheets: Tufted capuchin (*Cebus apella*) Behavior . <http://pin.primate.wisc.edu/factsheets/entry/tufted_capuchin/behav>. Accessed 2011 February 21
- Gron K.J. (2009) April 17. Primate Factsheets: Tufted capuchin (*Cebus apella*) Taxonomy, Morphology, & Ecology. http://pin.primate.wisc.edu/factsheets/entry/tufted_capuchin. Accessed March 12009.
- Hershkovitz, P. (1978). *Living New World monkeys (Platyrrhini): with an introduction to Primates*. Chicago University Press, Chicago.
- Menkhorst, P. & Knight, F. (2001). *A field guide to the mammals of Australia*. Oxford University Press, Australia.
- New South Wales Agriculture. 2000 *Policy on Exhibiting Primates in New South Wales* http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0006/121569/primate-policy-welfare.pdf. Accessed March 8 2011.
- Pavlin BI, Schloegel LM, Daszak P.(2009). Risk of importing zoonotic diseases through wildlife trade, United States. *Emerg Infect Dis* <http://www.cdc.gov/EID/content/15/11/1721.htm>
- Rocha, V.J., Aguiar, L.M., Ludwig, G., Hilst, C.L.S., Teixeira, G.M., Svoboda, W.K., Shiozawa, M.M., Malanski, L.S., Navarro, I.T., Marin, J.H.F., Passos, F.C. (2007). Techniques and Trap Models for Capturing Wild Tufted Capuchins, *International Journal of Primatology*, Vol. 28, No. 1, February 2007
- Rylands, A. B., Boubli, J.-P., Mittermeier, R. A. & Wallace, R. B. (2008). *Cebus apella*. In: IUCN 2008. IUCN Red List of Threatened Species. <www.icunredlist.org>. Downloaded on 07 February 2011.
- Szonyi, B, Piedad, A-F, Ramirez, M, Moreno, N, Ko, A.I (2010) An outbreak of severe leptospirosis in capuchin (*Cebus*) monkeys, *The Veterinary Journal*, May 2010
- Torres de Caballero, O.M., Ramirez, C., Yunis, E. (1976). Genus *Cebus* Q- and G-Band Karyotypes and Natural Hybrids, *International Journal of Primatology* (26): 310-321.

7. Appendices

APPENDIX A: CALCULATING TOTAL COMMODITY DAMAGE SCORE

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

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	Serious		
Highly, Moderately or Not Dangerous	Extreme	Moderate		
Highly, Moderately or Not Dangerous	Extreme	Low		
Highly, Moderately or Not Dangerous	Serious	Extreme		
Highly, Moderately or Not Dangerous	Serious	Serious		
Highly, Moderately or Not Dangerous	Moderate	Extreme		
Highly, Moderately or Not Dangerous	Serious	Moderate	Serious	Import restricted to those license holders approved for keeping serious threat species
Highly, Moderately or Not Dangerous	Serious	Low		
Highly, Moderately or Not Dangerous	Moderate	Serious		
Highly Dangerous	Moderate	Moderate		
Highly Dangerous	Moderate	Low		
Highly, Moderately or Not Dangerous	Low	Extreme		
Highly, Moderately or Not Dangerous	Low	Serious		
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		



Tasmania
Explore the possibilities

**RESOURCE MANAGEMENT AND
CONSERVATION DIVISION**

Department of Primary Industries, Parks,
Water and Environment

GPO Box 44, Hobart 7001

Ph: 1300 368 550

Email: wildlife.reception@dpiuwe.tas.gov.au

Visit: www.dpiuwe.tas.gov.au