PEST RISK ASSESSMENT

Antaresia spp. (Children's Pythons)

Antaresia childreni (Children's Python)

Antaresia stimsoni (Stimson's Python)

Antaresia maculosa (Spotted Python)

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Department of Primary Industries, Parks, Water and Environment
Resource Management and Conservation Division

Tasmania
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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 use within the Department.

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1. Summary

This risk assessment is for three pythons: *Antaresia childreni* (Children's Python); *A. stimsoni* (Stimson's Python); and *A. maculosa* (Spotted Python). Until recently, these three species were recognised as a single species, and they continue to be grouped together as 'Children's Pythons' or the 'Children's Python's Complex' in the literature and through the pet trade.

These three pythons are similar in appearance and can be difficult to distinguish. They are known to hybridise in captivity, and share many similarities including dietary preference, social behaviour and temperament. The pythons are common to the international and Australian commercial pet trade and are recognised for being comparatively easy to look after in captivity.

The term 'Children's Pythons' used in this assessment refers to the three species *A. childreni*, *A. stimsoni* and *A. maculosa*. It does not include the remaining member of the genus, *A. perthensis* (Pygmy Python), which is the world's smallest python and is substantially different from the assessed species.

The three pythons occupy distinct ranges in central Australia, tropical northern Australia and northeast Australia. Populations also occur on some offshore islands.

These species are not listed on the IUCN Red List of Threatened Species. They have not established feral populations outside their natural range and are not noted for causing environmental impacts. Climate modelling suggests that Tasmania's climate is moderately similar to the native range of these species.

Pythons of the genus *Antaresia* are listed under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The international trade of these species is controlled under this convention.

In Tasmania, Children's Pythons are controlled animals under the *Nature Conservation Act 2002*.

This risk assessment concludes that Children's Pythons are a moderate threat to Tasmania and proposes that imports be restricted to those licence holders approved for keeping moderate threat species.

2. Introduction

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2.1 NAME AND TAXONOMY

Kingdom: Animalia

Phylum: Chordata

Class: Reptilia

Order: Squamata

Family: Pythonidae

Genus: *Antaresia*

Species: *A. childreni, A. stimsoni, A. maculosa.*

Sub-species or variety (if applicable): Two subspecies of *A. stimsoni* have been noted, *A.s.stimsoni* and *A.s.orientalis* (Wilson and Swan 2003).

Common names (including any industry or trade names): Children's Pythons, Children's Python Complex, *Antaresia* "*childreni*". These three species were previously identified as a single species (*Liasis childreni*), which also included the Pygmy Python (*A. perthensis*) (Hoser 1999).

Known hybrids: These three species are known to hybridise in captivity (Hoser 1993, cited in Hoser 1999). No hybrids of these species have been found in the wild (Ehmann 1993).

Close relatives: Pygmy Python (*A. perthensis*).

2.2 DESCRIPTION

Members of the *Antaresia* genus are relatively small compared to other pythons, and rarely exceed one metre (Wilson and Swan 2003; Cogger 1992). Adults typically weigh 600g (Lourdais *et al.* 2007).

Children's Pythons are similar in appearance and length, and can be difficult to distinguish. These species occur in a variety of colours including cream, yellow brown, reddish-brown or purplish brown (Wilson and Swan 2003).

The markings are slightly different between the species. *A. childreni* has smooth-edged blotches that are roughly circular in appearance. The patterning on adults is weak or sometimes absent, the pattern on juveniles is more discernable. *A maculosa* has a prominent pattern of ragged-edged blotches which may join together to form wavy vertebral streaks on the front and back of the body. *A. stimsoni* has numerous irregular blotches, which are smooth-edged and circular or elongate (Wilson and Swan 2003).

The genus can be distinguished from other pythons by the enlarged head scales that form symmetrical plates, and the presence of heat-sensory pits on some lower labial scales (scales that

border the mouth opening) but none in the area of the nose and mouth. Children's Pythons also have three or more loreal scales (between the eye and the nostril) (Wilson and Swan 2003).

2.3 CONSERVATION AND LEGAL STATUS

CONSERVATION STATUS

Children's Pythons are common in their natural range and are not listed on the IUCN Red List of Threatened Species (IUCN 2010).

Children's Pythons are commonly traded as commercial pets internationally and in Australia. Trade animals are usually sourced from captive-bred populations (Hoser 1999), although some unlawful take from the wild does occur; impacting on local populations.

LEGAL STATUS

Pythons of the genus *Antaresia* are listed under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The international trade of this genus species is controlled under this convention.

In Tasmania, Children's Pythons are controlled animals under the *Nature Conservation Act 2002*.

3. Biology and Ecology

3.1 LIFE HISTORY

Courtship and mating in Children's Pythons usually occurs between April and August in Australia. Egg laying occurs between September and November, where between 10-12 eggs may be laid. Eggs are elongate, and each is approximately 12g in weight, 2.5cm in width and 4cm in length. Eggs are incubated for approximately 42-66 days. At hatching, young weigh approximately 8.2g and are between 22-30cm long (Greer 1997).

Pythons exhibit maternal care and females coil around their eggs and guard them until they hatch. Heat obtained from basking is transferred to the clutch, and females may also raise the temperature of the eggs by shivering. Maternal care ceases once the eggs hatch and the young disperse (Wilson and Swan 2003; Lourdais *et al*. 2007).

Colloquial reports suggest breeding is dependent on body size, and breeding typically commences at three years of age in females and two years of age in males. Sperm storage is not noted in these species.

These three species are noted for successfully hybridising in captivity, however no hybrids have been found in the wild (Hoser 1993, cited in Hoser 1999; Ehmann 1993).

3.2 HABITAT REQUIREMENTS AND PREFERENCES

Children's Pythons show a preference for warm dry regions, and are commonly found in well-drained areas, typically rocky outcrops with spinifex cover, caves, escarpments, dry woodlands and sparsely timbered areas (Wilson and Swan 2003; Hoser 1999). These species may occupy tree hollows, and may brood eggs in burrows, termite mounds and root boles (Gibbons and Lindenmayer 2002; Bedford pers. comm. cited in Lourdais *et al.* 2007).

3.3 NATURAL GEOGRAPHIC RANGE

The distribution of the Children's Pythons includes most of central and northern Australia, and some islands in Torres Strait (Wilson and Swan 2003; Hoser 1999). The native range of these species is estimated at approximately five million km^2.

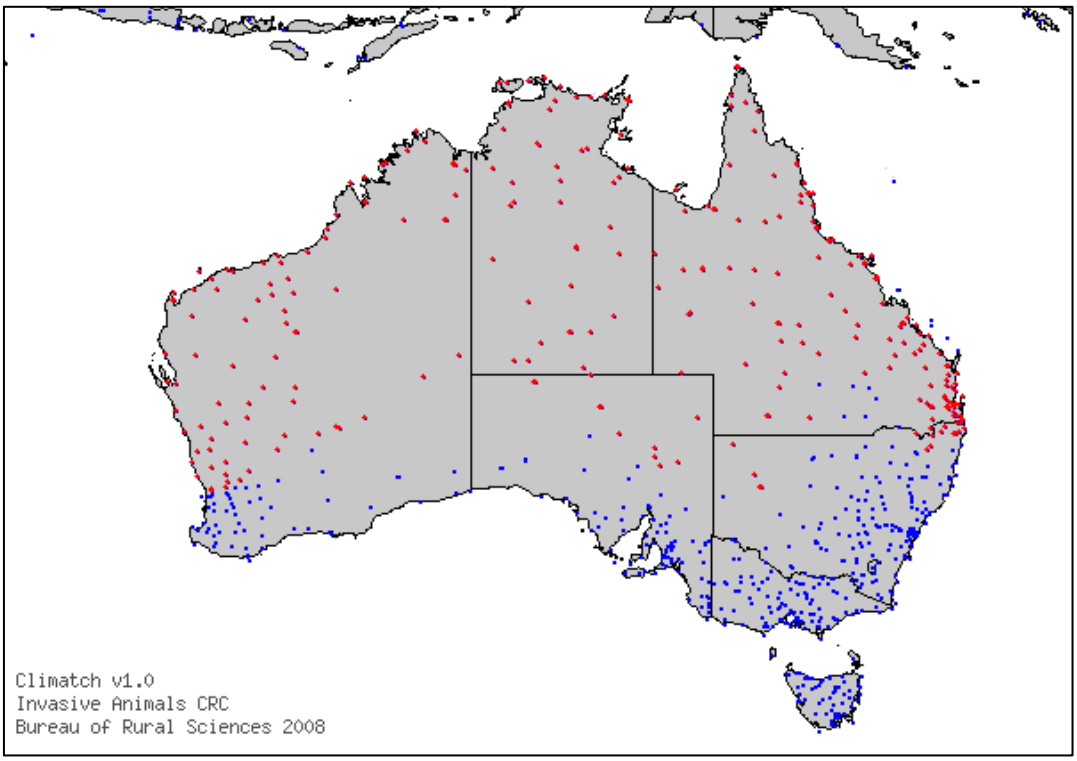

Figure 1. Natural range of Children's Pythons (distribution from Cogger 1992).

3.4 INTRODUCED GEOGRAPHIC RANGE

These species are not noted for establishing feral populations outside their natural range and are not listed on the Global Invasive Species Database list of the world's worst 100 invasive species (GISP 2005).

3.5 POTENTIAL DISTRIBUTION IN TASMANIA

Using modelling applications by the Australian Bureau of Agricultural and Resource Economics and Sciences (DAFF), climate is compared between the species' natural and historical distribution and potential distribution throughout Australia (shown in Figure 2). Modelling indicates that northern and central Australia has a highly similar climate which may support the establishment of introduced populations, but that the climate in Tasmania is only moderately similar.

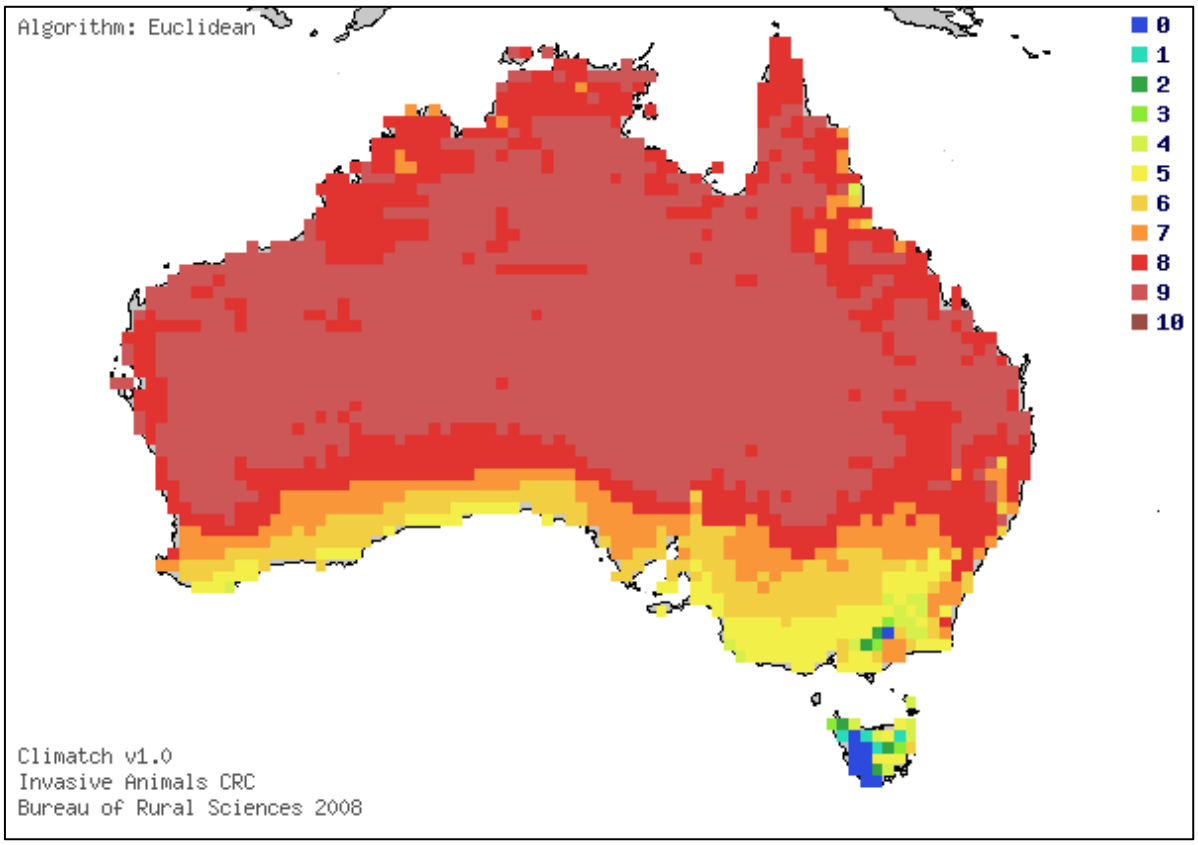

Figure 2. Climate comparison between the historical range of Children's Pythons and the whole of Australia, where 10 is a 'perfect' match and 0 is having a very dissimilar climate. Tasmania shows a moderate match (highest score: 6) (Distribution source: Cogger 1992).

3.6 DIET AND FEEDING BEHAVIOUR

Children's Pythons are generalist predators, capable of consuming a broad range of prey including small mammals, birds, lizards, frogs, and other snakes. Bats may be seized as they leave cave entrances (Wilson and Swan 2003). No impact to agriculture has been noted.

These species may ambush prey but may also actively hunt. Pythons are able to locate prey from chemical cues using their forked tongue, and heat sensitive pits on the head are also used to detect warm-blooded animals. Pythons are non-venomous and kill prey via constriction, enveloping and suffocating prey in tight coils (Wilson and Swan 2003).

3.7 SOCIAL BEHAVIOUR AND GROUPINGS

These species are not noted for being territorial. Aggressive behaviour may be demonstrated towards predators, and includes flicking of the tail or the entire body, the release of a foul smelling liquid from the cloaca, or a series of strikes or bites. These species may sometimes adopt a passive defence by coiling into a ball and hiding their head (Cermak 2008).

Children's Pythons do not form groups. Individuals are largely solitary; coming together only to breed. Maternal care of young is noted but care ceases once the eggs hatch and the young disperse (Wilson and Swan 2003; Lourdais *et al.* 2007).

3.8 NATURAL PREDATORS AND DISEASE

Pythons in the genus *Antaresia* are relatively small and have a wide range of predators including birds of prey, goannas and dingoes (Cermak 2008). In Tasmania, potential predators include Tiger Snakes (*Notechis scutatus*), Spotted-tailed Quolls (*Dasyurus maculatus*), birds of prey such as eagles and hawks, feral cats and, should it become established, the introduced European Red Fox (*Vulpes vulpes*).

Limited literature is available detailing diseases specific to these species, and the importance of diseases and parasites is largely unknown (Greer 1997). Ticks are a common external parasite, and internal parasites include protozoans, cestodes and nematodes (Greer 1997). These species are noted for being relatively hardy against disease, making them favourable species for captivity (Hoser 1999).

3.9 THREAT TO HUMAN SAFETY

There is potential for these species to cause human injury. While the species are noted for having an even temperament and for being comparatively easy to look after in captivity, individuals may be 'snappy' and are known to lunge and bite, with the potential to cause severe discomfort and moderate injury requiring medical attention. These species will not make unprovoked attacks and are not noted for causing serious injury requiring hospitalisation.

A health risk commonly associated with reptiles is salmonellosis; a diseased caused by *Salmonella* bacteria (AWHN 2010). This disease is spread in the animal's faeces, but can be prevented by simple hygiene measures. Salmonellosis is a notifiable disease under the Tasmanian *Animal Health Act 1995*.

3.10 HISTORY AS A PEST

There is no evidence of these species being introduced or forming populations outside their natural range. No historical pest impacts or damage to the environment or agriculture have been noted.

3.11 POTENTIAL IMPACT IN TASMANIA

Children's Pythons are not noted for causing impacts to environmental assets, and climate modelling suggests that Tasmania's climate is moderately suitable for these species. Should a population establish in Tasmania, these species have the potential to prey upon a variety of native

and threatened fauna, including the New Holland Mouse (*Pseudomys novaehollandiae*) which is a listed species under the Tasmanian *Threatened Species Protection Act 1995*.

4. Risk Assessment

4.1 PREVIOUS RISK ASSESSMENTS

No formal risk assessments have been noted for these species.

4.2 RISK ASSESSMENT

The following risk assessment determines the risk of Children's Pythons (*Antaresia childreni, A. stimsoni, A. maculosa*) to Tasmania using the Bomford model (2008) and proposes assigned threat categories and import classifications for these species.

Species:	**Children's Pythons (*Antaresia childreni, A. stimsoni, A. maculosa*)**	
Date of Assessment:	December 2011	
Literature search type and date:	See references	
Factor	**Score**	
A1. Risk posed from individual escapees (0-2)	0	*Animal posing a low risk of harm to people (i.e. animal that will not make unprovoked attacks causing injury requiring medical attention, and which, even if cornered or handled, are unlikely to cause injury requiring hospitalisation).* These pythons may cause injury by biting, but will not make unprovoked attacks.
A2. Risk to public safety from individual captive animals (0-2)	0	*Nil or low risk (highly unlikely or not possible).* Risk arising from irresponsible use of product 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 = 0	**Public Safety Risk Ranking** A ≥ 2, Highly Dangerous A = 1, Moderately Dangerous A = 0, Not Dangerous = Not Dangerous
B1. Family random effect value	-0.08	*Pythonidae.*
B2. Proportion of introduction events that led to species establishment (Prop.species value)	0.065	*There are no records of these species, or the genus, being introduced into new areas. At the family level, 4 out of 61 attempts by related species were successful.*
B3. S(Climate 6 value)	-1.74	*Climate 6 Score: 0.033.*

Stage B. Likelihood of establishment (risk that a particular species will establish a wild population in Tasmania)	**Establishment Risk Score** = 1/ (1 + exp(0.80 – 2.90 (Prop. species) – S(Climate6) – Family Random Effect)) =1/(1+EXP(0.8-2.9*(0.065)-(-1.74)-(-0.08))) = 0.08	**Establishment Risk Ranking** B = ≥0.86, Extreme B = 0.40-0.85, High B = 0.17-0.39, Moderate B = ≤ 0.16, Low = Low
C1. Taxonomic group (0-4)	0	*Other group.*
C2. Overseas range size (0-2)	0	*Range <10 million km².* The natural range of these species is estimated at 5 million km².
C3. Diet and feeding (0-3)	0	*Not a mammal.*
C4. Competition for native fauna for tree hollows (0-2)	2	*Can nest or shelter in tree hollows.*
C5. Overseas environmental pest status (0-3)	0	*Never reported as an environmental pest in any country or region.*
C6. Climate match to areas with susceptible native species or communities (0-5)	4	*50% of the geographic range of one or more susceptible native species that are listed as threatened under Tasmanian legislation occurs within the mapped areas of the six highest climate match classes.* 50% of the Tasmanian range of the New Holland Mouse occurs within the highest six climate match classes.
C7. Overseas primary production (0-3)	0	*No reports of damage to crops or primary production in any country or region.*
C8. Climate match to susceptible primary production (0-5)	0	*No climate match to susceptible primary production.* No impact to industry has been noted.
C9. Spread disease (1-2)	1	*Reptile.*
C10. Harm to property (0-3)	0	*<$100,000 per year.*
C11. Harm to people (0-5)	2	*Low risk of harm to people.*
Stage C. Quantitative Consequence Assessment	**Consequence Risk Score** = sum of C1 to C11 = 9	**Consequence Risk Ranking** C > 19, Extreme C = 15-19, High C = 9-14, Moderate C < 9, Low = Moderate

Adverse impacts	There is no evidence of these species causing adverse impacts to the environment outside their natural range.
Closes relatives with similar behavioural and ecological strategies that have had adverse impacts elsewhere	No immediate relatives in Australia known to cause adverse impacts. Other python species (e.g. Burmese Python) are known to have a significant adverse impact.
Dietary generalists	These species are carnivorous.
Stir up sediments to increase turbidity in aquatic habitats	Aquatic habitats are not the preferred habitat type for these species.
Occur in high densities in their native or introduced range	These species occur in low densities in their native range.
Have the potential to cause poisoning and/or physical injury	These species are not poisonous but have the potential to cause human injury requiring medical attention. They will not make unprovoked attacks and serious injury (requiring hospitalisation) is highly unlikely.
Harbour or transmit diseases or parasites that are present in Australia	These species may harbour salmonella bacteria and parasites such as ticks, protozoans, cestodes and nematodes.
Have close relatives among Australia's endemic reptiles and amphibians	These species are endemic to Australia and are closely related to the Pygmy Python (*A. perthensis*). There are no close relatives in Tasmania.
Are known to have spread rapidly following their release into new environments	These species are not noted for establishing feral populations outside their natural range.
Stage C. Qualitative Consequence Assessment	Based on the qualitative consequence assessment, the estimated consequence of Children's Python establishing in Tasmania is LOW.
Stage C. Consequence of Establishment (risk that an established population would cause harm)	Quantitative Consequence: Moderate Qualitative Consequence: Low **Highest Consequence Assessment: Moderate**
ASSIGNED THREAT CATEGORY:	**MODERATE**
PROPOSED IMPORT CLASSIFICATION:	**IMPORT RESTRICTED TO THOSE LICENCE HOLDERS APPROVED FOR HANDLING MODERATE THREAT SPECIES**

5. Risk Management

This risk assessment concludes that Children's Pythons (*Antaresia childreni, A. stimsoni and A. maculosa*) are a moderate threat to Tasmania and that imports be restricted to those licence holders approved for keeping moderate threat species. On the basis of this risk assessment, it is recommended that these species 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*, the following mandatory conditions will apply to the import and keeping of these 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 licence.
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.

To ensure Carpet Pythons are not unlawfully sourced from wild populations, the import of this species is subject to certification of the captive breed status.

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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**	N/A		
Aquaculture	**6**	N/A		
Sheep (includes wool and meat)	**5**	N/A		
Vegetables	**5**	N/A		
Fruit (includes wine grapes)	**5**	N/A		
Poultry (including eggs)	**1.5**	N/A		
Cereal grain (includes wheat, barley, sorghum etc)	**1**	N/A		
Other crops and horticulture (includes nuts and flowers)	**1**	N/A		
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	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 those licence 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	Moderate	Import restricted to those licence holders approved for keeping moderate threat species
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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