

# PEST RISK ASSESSMENT

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## Central bearded dragon

*Pogona vitticeps*



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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 Central bearded dragon (*Pogona vitticeps*) is an Australian native lizard which is found in a wide range of arid to semi-arid habitats in the interior of Queensland, New South Wales, Victoria, South Australia and the Northern Territory.

The species is common and widespread throughout its Australian range and is not listed on the IUCN Red List of Threatened Species. Central bearded dragons are commonly used for commercial display in zoos and recreational keeping, and are common to the global pet trade. They are able to be handled easily and are described as 'docile and social', making them favourable pets for children.

The Central bearded dragon is legally protected in all range jurisdictions of Australia under various Acts, and was rejected for inclusion on the list of specimens suitable for import under the *Environment Protection and Biodiversity Conservation Act 1999* (DSEWPC, 2010).

The species is a 'controlled animal' under the *Tasmanian Nature Conservation Act 2002*.

The Central bearded dragon is not considered a pest species. It has not established feral populations outside its native range and no introduction attempts have been noted. There is no evidence of the species causing any significant impacts on the environment or agriculture.

There is a moderate likelihood of this species establishing in Tasmania. Anticipated impacts include competition with the Mountain dragon (*Rankinia diemensis*), and the Tussock skink (*Pseudemoia pagenstecheri*), and predation upon the endemic Ptunarra brown butterfly (*Oreixenica ptunarra*). The Tussock skink and the Ptunarra brown butterfly are listed threatened species under the *Threatened Species Protection Act 1995*.

This risk assessment concludes that Central bearded dragons 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

<b>Kingdom:</b>	Animalia
<b>Phylum:</b>	Chordata
<b>Class:</b>	Reptilia
<b>Order:</b>	Squamata
<b>Family:</b>	Agamidae
<b>Genus:</b>	<i>Pogona</i>
<b>Species:</b>	<i>P. vitticeps</i>



Photo: George Chernilevsky. Image from Wikimedia Commons.

**Sub-species or variety (if applicable):** None known.

**Common names (including any industry or trade names):** Central bearded dragon, Inland bearded dragon.

**Known hybrids:** This species may hybridise in captivity with the Downs bearded dragon *Pogona henrylawsoni* (Rybak, 1996 cited in Greer, 2006).

Experimental hybridisation between the Central bearded dragon and the Eastern bearded dragon (*P. barbata*) was successful but resulted in highly deformed hybrids with intermediate characteristics of both parental types (Badham, 1976).

**Close relatives:** The *Pogona* genus comprises seven species, all endemic to Australia (Ezaz *et al.* 2005). Other members of the genus are the Eastern bearded dragon (*P. barbata*), Downs bearded dragon (*P. henrylawsoni*), Small-scaled bearded dragon (*P. microlepidota*), Dwarf bearded dragon (*P. minor*), Western bearded dragon (*P. minima*) and Nullarbor bearded dragon (*P. nullarbor*) (Wilson and Swan, 2003).

### 2.2 DESCRIPTION

The body of the Central bearded dragon is robust and strongly depressed. The species has a broad head, with a well-developed rounded beard and a row of spines across the throat (Wilson and Swan, 2003). The claws are long and narrow, and are adapted for climbing on rocks and plant surfaces (Mitchell, 2007). The tail does not regenerate when lost (Doneley, 2006).

Adults weigh on average 288g (Seebacher and Franklin, 2011). Snout vent length in adults is typically around 250mm (Wilson and Swan, 2003), and total length ranges from 330-610mm (Ezaz *et al.* 2005). Body length varies between regions and adults are smaller towards the southern limit of the species' distribution in Victoria (Witten and Coventry, 1990). Sexes are not strongly dimorphic, but males can be distinguished from females as they have a wider cloacal opening, the

base of the tail is wider, the head is usually larger with a larger beard (often black) and males possess hemipenes (Doneley, 2006).

Colour varies from shades of grey to rich reddish orange and some individuals have a bright orange flush on the side of the head and around the eye (Wilson and Swan, 2003). Two rows of pale blotches run from the nape to the hips, which may form broad wavy stripes or be joined by pale transverse bars. The species has the ability to change colour by altering melanin pigments in its skin, and may change colour when threatened. Colour change consists of overall darkening and lightening of colour (yellows and orange tones intensify when hot or excited, become dark and drab when cold or frightened). Males show solidly black beard when behaving territorially.

Juveniles have a similar appearance to adults but tend to lack the brighter orange and yellow colour shades.

Appearance is slightly duller during ecdysis; the shedding process where sections of the skin peel away during a few days. The frequency of this event depends on the individual's age, growth rate, ambient temperature and food availability (Doneley, 2006).

The Central bearded dragon is similar in appearance to the Eastern bearded dragon (*P. barbata*). These species can be differentiated as the Central bearded dragon has a more robust body, a broad head, and possesses a row of spines along the lateral edge of the body which continue over the forearm (Witten and Coventry, 1990; Cogger, 1992). The Eastern bearded dragon has several rows of spines in this area which widen into a broad band (Cogger, 1992), and also has a larger beard that has a fold reaching to the insertion of the forelimb when at rest.

## 2.3 CONSERVATION AND LEGAL STATUS

### CONSERVATION STATUS

The Central bearded dragon is common and widespread throughout its Australian range (Ezaz *et al.* 2005). The species is not listed on the IUCN Red List of Threatened Species (IUCN, 2010).

The species is commonly used for commercial display in zoos and recreational keeping (subject to State/Territory provisions). The species is the most common agamid in the global pet trade (Ezaz *et al.* 2005).

### LEGAL STATUS

The Central bearded dragon is legally protected in all range jurisdictions of Australia under various Acts (DEH, 1995).

In 2008, *P. vitticeps* was rejected for inclusion on the list of specimens suitable for import under the *Environment Protection and Biodiversity Conservation Act 1999* (DSEWPC, 2010).

The species is a 'controlled animal' under the *Tasmanian Nature Conservation Act 2002*.

# 3. Biology and Ecology

## 3.1 LIFE HISTORY

Courtship behaviour begins in spring as day temperatures increase and lizards become more active (Doneley, 2006). Males have the ability to breed all year except for a short period in late summer; while females produce eggs only in spring and early summer (Doneley, 2006).

Egg laying occurs about 2-3 weeks after mating (Doneley, 2006). The Central bearded dragon lays 11-16 eggs, which are laid in a shallow egg chamber in the ground (DEH, 1995). Eggs are white, elongate and soft-shelled. The eggs will take up moisture from the soil but may dry out and die when exposed to air outside the chamber (DEH, 1995). Eggs hatch after period of about 50-70 days (Doneley, 2006). There is no parental care of the eggs or young (DEH, 1995).

While temperature-dependent sex determination is known in agamid lizards, gender in the Central bearded dragon is determined genotypically (via sex chromosomes) (Ezaz *et al.* 2005).

The age of sexual maturity has not been measured although it is estimated to be approximately two or three years (DEH, 1995). Body size and growth rates are more important than age when determining sexual maturity in bearded dragons (Doneley, 2006).

Animals may live for 10-15 years (Johnson, 2006).

Short-term sperm storage has been noted in this genus, although the precise length of time is uncertain (Doneley, 2006).

## 3.2 HABITAT REQUIREMENTS AND PREFERENCES

The Central bearded dragon is found in a wide range of arid to semi-arid habitats including dry sclerophyll forest, eucalypt and *Callitris* woodland, mallee and Acacia scrub, chenopod steppes, and sandplain and sandridge desert (Cogger, 1992). It appears to tolerate considerable habitat alteration and is common in cleared agricultural landscapes.

The species is semi-arboreal, and perches on fallen timber, fence posts, large rocks, raised roadside verges and trees (Cogger, 1992; McAlpin, 1995). This species may use tree hollows (Gibbons and Lindenmayer, 2000), and can shelter under fallen timber, in leaf litter under shrubs, under rock overhangs, or in trees and spinifex (Cogger, 1992; McAlpin, 1995).

The species is typically found at altitudes between 0-300m, although it can be found in areas of 600m altitude in some areas. It is most active at higher temperatures when its body temperature is between 30-39°C (DEH, 1995). The species' basks to increase body temperature, particularly in the morning and late afternoon, and suffers high mortality as roadkill from basking on roads (DEH, 1995; Mitchell, 2007) and also because of its preference for very open terrain where it can scan a wide area for potential food or possible social interactions. In high temperatures, the Central bearded dragon opens its mouth to reduce its body temperature by evaporative cooling (Tattersall and Gerlach, 2005 cited in Greer, 2006). During cold periods (typically below 10°C), the genus will

shelter under a rock or burrow, and will reduce its appetite or stop feeding altogether (Doneley, 2006). This cool-down period (known as ‘brumation’) is beneficial for reproduction, and individuals who have not been allowed to cool have low fertility rates (Johnson, 2006).

### 3.3 NATURAL GEOGRAPHIC RANGE

As shown in Figure 2, the Central bearded dragon is found in the interior of Queensland, New South Wales, Victoria, South Australia and the Northern Territory (DEH, 1995). The natural range is estimated at approximately 1.5 million km<sup>2</sup>.

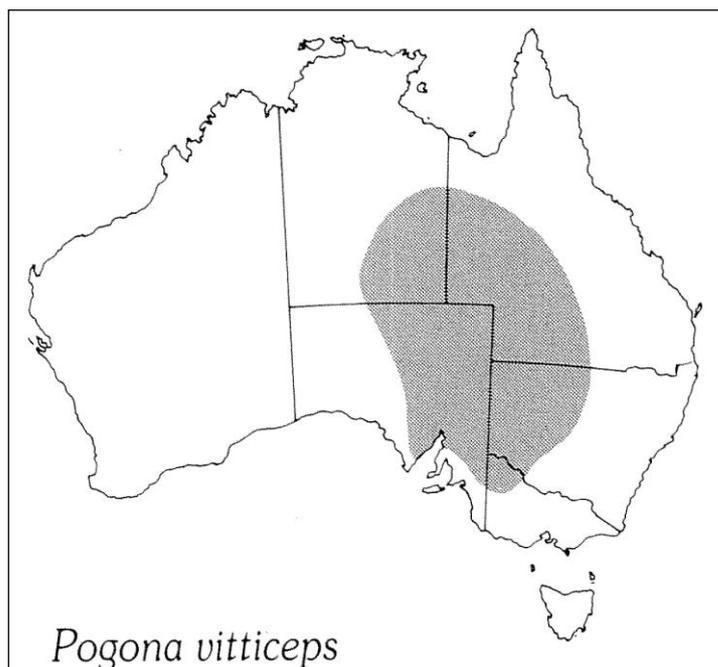


Figure 1. Natural range of the Central bearded dragon (*P. vitticeps*). (Cogger, 1992).

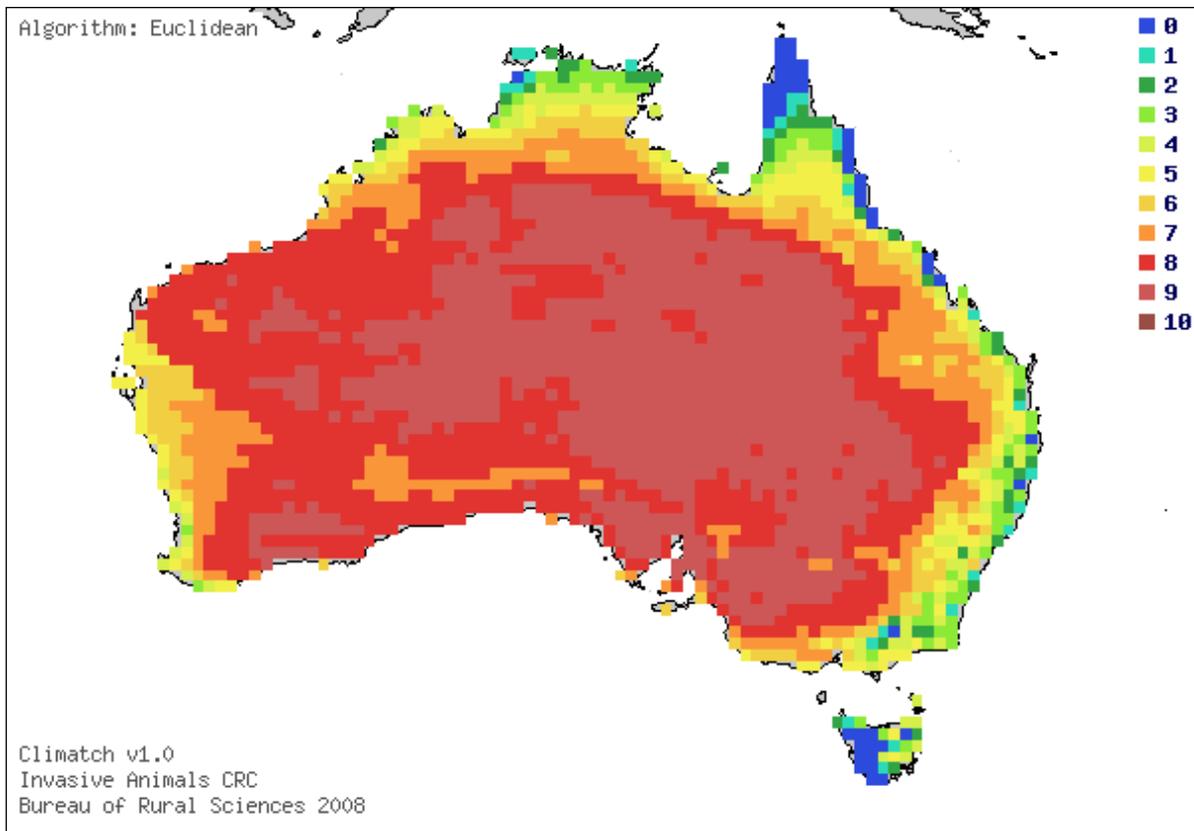
### 3.4 INTRODUCED GEOGRAPHIC RANGE

There is no evidence of Central-bearded dragons establishing feral (non-naturally occurring) populations outside their native range and no introduction attempts have been noted. The species is not recorded on the Global Invasive Species Database (GISP, 2011).

### 3.5 POTENTIAL DISTRIBUTION IN TASMANIA

Using modelling applications by the Bureau of Rural Science (DAFF), climate is compared between the species' historical distribution and potential distribution throughout Australia (shown in Figure 2). Modelling indicates that central Australia has highly similar climate which may support the

establishment of introduced populations. Tasmania's climate is not very similar (highest climate match score: 5).



**Figure 2.** Climate comparison between the historical range of *P. vitticeps* and the whole of Australia, where 10 is a 'perfect' match and 0 is having a very dissimilar climate. Tasmania shows a match between 0 and 5. (Distribution source: Cogger, 1992).

### 3.6 DIET AND FEEDING BEHAVIOUR

The Central bearded dragon is omnivorous. In the wild, the diet is mainly composed of insects, and includes ants, beetles and other arthropods, although it does consume leaves, newly-sprouted plants and flowers (Cogger, 1992; McAlpin, 1995; Henle, 1989 cited in Greer, 2006). In captivity, the species will eat plant matter such as bananas, dandelion flowers and vegetables, as well as ants, beetles, crickets, flies, mealworms, slaters, slugs, spiders, worms and minced meat (Kennerson and Cochrane, 1981, Mantell, 2001; cited in Greer, 2006).

Central bearded dragons eat insects directly from plants and flowers, but also leap and catch insects from the air (McAlpin, 1995). Plants, leaves and flowers are often eaten while en route to a different location, although individuals may exploit sprouting plants and spend short periods grazing an area (McAlpin, 1995).

The feeding range of this species has not been noted, although it is expected to be relatively small and localised. Individuals may stay in the same area for long periods, particularly in extreme heat. One individual was recorded occupying the same tree for three weeks (McAlpine, 1995).

This species is unlikely to have an impact on agriculture.

### 3.7 SOCIAL BEHAVIOUR AND GROUPINGS

Members of the *Pogona* genus are territorial, and are not noted for forming groups in the wild. Males stake out territories and male-male dominance is determined by body size (Doneley, 2006). Aggressive behaviour among males includes posturing, beard displays, and combat involving circling and tail biting (Doneley, 2006).

Females and juveniles maintain smaller territories within a male's territory, and are submissive to males (Doneley, 2006). Bearded dragons exclude other species of bearded dragons from their territory and also exclude other reptile species (Doneley, 2006).

Prior to mating, males begin display behaviour, which includes bobbing of the head and waving of the arms. Males are intensely coloured during displays, and the head and body becomes bright orange while the beard and chest becomes black (McAlpin, 1995).

The Agamid family generally relies on its ability to blend into the environment to avoid predators, and may rapidly change colour to shades of grey to avoid being seen (Witten, 1993; McAlpin, 1995). When detected, they may flee or perform aggressive displays. When under direct attack, the Central bearded dragon opens the mouth to display its yellow membranes and extend the 'beard' (Witten, 1993). They darken the colour of their skin and flatten their bodies, and will hiss and make small jumps towards their attacker (Doneley, 2006).

### 3.8 NATURAL PREDATORS AND DISEASE

The Central bearded dragon is vulnerable to predation from a number of birds, snakes and large carnivores such as foxes and feral cats (Read and Bowen, 2001). 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*).

External parasites such as mites and ticks are occasionally reported in this genus (Doneley, 2006). The species is vulnerable to multiple internal parasites and common gastrointestinal parasites found in captive animals include pinworms, microsporidians, flagellated protozoa and coccidia (Doneley, 2006; Mitchell, 2007). Coccidiosis is a major cause of mortality among bearded dragons and coccidia can persist in bearded dragon colonies and are difficult to remove (Mitchell, 2007).

The majority of health problems found in captive individuals are due to inappropriate hygiene and animal husbandry techniques (Doneley, 2006). Respiratory conditions and skin infections from bacteria and fungi may occur if individuals are unhygienic or wet (Doneley, 2006). Yellow Fungus Disease has been noted in bearded dragons (Doneley, 2006). This disease is infectious and may

cause skin and underlying tissues to die, and may extend to individual organs or kill the animal (Doneley, 2006).

Metabolic Bone Disease is common in captive bearded dragons, particularly juveniles. This disease is primarily due to inappropriate animal husbandry (e.g. calcium-deficient diet, lack of UV light) and can cause lameness, soft jaws and spinal deformities (Doneley, 2006; Mitchell, 2007).

The Central bearded dragon is vulnerable to adenovirus infection (Jacobson *et al.* 1996). Adenovirus infections have been reported in multiple reptile species, and can lead to mortality in groups of captive animals (Jacobson *et al.* 1996). The disease appears to target juveniles and causes weakness and lethargy (Kim *et al.* 2002). In one case, 30 of 200 (15%) hatchlings died from the disease (Kim *et al.* 2002). There is no effective treatment for infection and infected are usually culled from breeding populations (Mitchell, 2007).

Constipation is frequently encountered in captive animals (Johnson, 2006).

### 3.9 THREAT TO HUMAN SAFETY

Bearded dragons are one of the most popular pet lizard species. They are easy to maintain and present little risk to human safety. They are a calm species and rarely bite, scratch or whip people with their tails (Johnson, 2006). They can be handled easily and are described as 'docile and social', making them favourable pets for children (Johnson, 2006). No attacks or injuries to humans have been noted and injuries requiring hospitalisation are highly unlikely.

The main health risk associated with this species is salmonellosis, caused by the spread of *Salmonella* bacteria (Johnson, 2006; Mitchell 2007). This disease is spread in the animal's faeces and is common among reptiles, but can be prevented by simple hygiene measures such as washing hands (Johnson, 2006). Salmonellosis is a notifiable disease under the Tasmanian *Animal Health Act 1995*.

### 3.10 HISTORY AS A PEST

The Central bearded dragon is not considered a pest species. It has not established feral populations outside its native range and is not recorded on the Global Invasive Species Database (GISP, 2011). No introduction attempts have been noted.

There is no evidence of the species causing impacts on the environment or agriculture.

### 3.11 POTENTIAL IMPACT IN TASMANIA

The Central bearded dragon is not noted for causing impacts to environmental assets, although there is potential for the species to impact on native and threatened fauna.

Should a population of Central bearded dragons establish in Tasmania, the species may possibly compete for resources with Tasmanian lizard species such as the Mountain dragon (*Rankinia*

*diemensis*), and the Tussock skink (*Pseudemoia pagenstecheri*). The Tussock skink is a threatened species and is listed as 'vulnerable' under the *Threatened Species Protection Act 1995*. Approximately 40% of the Tussock skink population occurs within areas identified as suitable for the Central bearded dragon.

Based on climate modelling, the Central bearded dragon may possibly compete with the threatened Glossy grass skink (*Pseudemoia rawlinsoni*), which has a small localised range in northern Tasmania. Direct competition is unlikely however, as the Glossy grass skink inhabits wetter habitats such as swamps, watercourses and areas subject to frequent flooding.

As a predator, the Central bearded dragon may impact on the threatened Ptunarra brown butterfly (*Oreixenica ptunarra*). This species is endemic to Tasmania and is listed as 'vulnerable' under the *Threatened Species Protection Act 1995*. Approximately 20% of the Tasmanian Ptunarra brown butterfly population is found in areas identified as suitable for the Central bearded dragon.

There is also slight potential for the Central bearded dragon to prey upon the threatened Tasmanian snails *Pasmaditta jungermanniae* and *Charopidae* species ("Skemps" snail), although any impacts to these species are unlikely as they inhabit wetter areas.

## 4. Risk Assessment

### 4.1 PREVIOUS RISK ASSESSMENTS

No formal risk assessments have been noted for this species.

### 4.2 RISK ASSESSMENT

The following risk assessment determines the risk of the Central bearded dragon (*Pogona vitticeps*) to Tasmania using the Bomford model (2008) and proposes assigned threat categories and import classifications for the species.

<b>Species:</b>	<b>Central bearded dragon (<i>Pogona vitticeps</i>)</b>	
Date of Assessment:	May 2011	
Literature search type and date:	See references	
<b>Factor</b>	<b>Score</b>	
A1. Risk posed from individual escapees (0-2)	0	<i>Animal posing a low risk of harm to people (animal that will not make unprovoked attacks causing injury requiring medical attention, and which, even when cornered or handled, is unlikely to cause injury requiring hospitalisation).</i>
A2. Risk to public safety from individual captive animals (0-2)	0	<i>Nil or low risk (highly unlikely or not possible). Risk arising from irresponsible use of product is low.</i>
<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> = A1 + A2 = 0	<b>Public Safety Risk Ranking</b> A ≥ 2, Highly Dangerous A = 1, Moderately Dangerous A = 0, Not Dangerous = Not Dangerous
B1. Family random effect value	-0.11	<i>Agamidae.</i>
B2. Proportion of introduction events that led to species establishment (Prop.species value)	0.625	<i>20 out of 32 attempts were successful at the Family level.</i>
B3. S(Climate 6 value)	-1.88	<i>Low Climate 6 Score (0).</i>
<b>Stage B. Likelihood of establishment (risk that a particular species will establish a wild population in Tasmania)</b>	<b>Establishment Risk Score</b> = $1 / (1 + \exp(0.80 - 2.90 (\text{Prop.species} - \text{S(Climate6)} - \text{Family Random Effect})))$	<b>Establishment Risk Ranking</b> B = ≥0.86, Extreme B = 0.40-0.85, High B = 0.17-0.39, Moderate B = ≤ 0.16, Low

	$= 1/(1+\exp(0.8-2.9*(0.625)-(-1.8)-(-0.11)))$ = 0.27	= Moderate
C1. Taxonomic group (0-4)	NA	
C2. Overseas range size (0-2)	0	Range is estimated at 1.5 million km <sup>2</sup> .
C3. Diet and feeding (0-3)	0	<i>Other herbivorous mammal or not a mammal.</i>
C4. Competition for native fauna for tree hollows (0-2)	2	<i>Can nest or shelter in tree hollows.</i>
C5. Overseas environmental pest status (0-3)	0	<i>Never reported as an environmental pest in any country or region.</i>
C6. Climate match to areas with susceptible native species or communities (0-5)	3	<i>More than 25% of the geographic range overlaps with susceptible native species. Approximately 40% of the Tussock skink population occurs within areas identified as suitable for the Central bearded dragon.</i>
C7. Overseas primary production (0-3)	0	<i>No reports of damage to crops or other primary production in any country or region.</i>
C8. Climate match to susceptible primary production (0-5)	0	No damage to primary production is expected.
C9. Spread disease (1-2)	1	<i>Reptile.</i>
C10. Harm to property (0-3)	0	<i>&lt;\$100,000 per year.</i>
C11. Harm to people (0-5)	1	<i>Low risk of harm to people.</i>
<b>Stage C. Quantitative Consequence Assessment</b>	<b>Consequence Risk Score</b> = sum of C1 to C11 = 7	<b>Consequence Risk Ranking</b> C > 19, Extreme C = 15-19, High C = 9-14, Moderate C < 9, Low = Low
Adverse impacts	There is no evidence of the species causing adverse impacts to the environment or agriculture.	
Closes relatives with similar behavioural and ecological strategies that have had adverse impacts elsewhere	Many members of the <i>Pogona</i> genus have similar behavioural or ecological strategies, but none are noted for having adverse impacts elsewhere.	
Dietary generalists	The species has traits of a generalist and consumes a variety of insects and plant matter. In captivity, the species eat a wide variety of fruit and vegetables, as well as insects, mealworms, slaters, slugs, spiders, worms and minced meat.	
Stir up sediments to increase turbidity in aquatic	This species is does not inhabit aquatic environments.	

habitats	
Occur in high densities in their native or introduced range	Central bearded dragons are not noted for occurring in high densities throughout their range, but are common in areas where they are found.
Have the potential to cause poisoning and/or physical injury	This species has limited potential to cause poisoning or physical injury. They are able to be handled easily and are favourable pets for children. No attacks or injuries to humans have been noted and injuries requiring hospitalisation are highly unlikely.
Harbour of transmit diseases or parasites that are present in Australia	This species is an Australian endemic and harbours diseases and parasites which are present in the country. Parasites include external parasites such as mites and ticks, and internal parasites such as pinworms, microsporidians, flagellated protozoa and coccidia. The majority of health problems found in captive individuals are due to inappropriate hygiene and animal husbandry techniques (Doneley, 2006). Yellow Fungus Disease, Metabolic Bone Disease and Adenovirus infections have been reported in this species.
Have close relatives among Australia's endemic reptiles and amphibians	The Central bearded dragon is endemic to Australia and has several close relatives living within Australia. No species of the <i>Pogona</i> genus are endemic to Tasmania.
Are known to have spread rapidly following their release into new environments	There is no evidence of the Central-bearded dragon establishing feral (non-naturally occurring) populations outside their native range and no introduction attempts have been noted.
<b>Stage C. Qualitative Consequence Assessment</b>	Based on the outcomes of the qualitative consequence assessment, it is estimated that the potential consequence of Central bearded dragon establishing in Tasmania is moderate.
<b>Stage C. Consequence of Establishment (risk that an established population would cause harm)</b>	Quantitative Consequence : Moderate Qualitative Consequence : Moderate <b>Highest Consequence Assessment: Moderate</b>
<b>ASSIGNED THREAT CATEGORY:</b>	<b>MODERATE</b>
<b>PROPOSED IMPORT CLASSIFICATION:</b>	<b>IMPORT RESTRICTED TO THOSE LICENSE HOLDERS APPROVED FOR KEEPING MODERATE THREAT SPECIES</b>

## 5. Risk Management

This risk assessment concludes that Central bearded dragons (*Pogona vitticeps*) 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 Central bearded dragons 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 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 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.

## 6. References

- Badham, J.A. (1976). The *Amphibolurus barbatus* Species-group (Lacertilia : Agamidae). *Australian Journal of Zoology* (24): 423-443.
- Cogger, H.G. (1992). *Reptiles and amphibians of Australia* (5<sup>th</sup> Ed.). Reed Books, Australia.
- Doneley, B. (2006). Caring for the bearded dragon. *Proceedings of the North American Veterinary Conference* (20): 1607-1611.
- Gibbons, P. and Lindenmayer, D. (2002). *Tree hollows and wildlife in Australia*. CSIRO Publishing, Australia.
- Ezaz, T., Quinn, A.E., Ikuo, M., Sarre, S.D. and Georges, A. (2005). The dragon lizard *Pogona vitticeps* has ZZ/ZW micro-sex chromosomes. *Chromosome Research* (13): 763-776.
- Greer, A.E. (2006). Encyclopedia of Australian Reptiles. Australian Museum Online.
- Global Invasive Species Programme (GISP) Global Invasive Species Database. (2011). <<http://www.issg.org/database>> (Accessed 18 April 2011).
- IUCN 2010. *IUCN Red List of Threatened Species*. Version 2010.4. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Accessed 18 April 2011.
- Jacobson, E.R., Kopit, W., Kennedy, F.A. and Funk, R.S. (1996). Coinfection of a Bearded Dragon, *Pogona vitticeps*, with Adenovirus- and Dendrovirus-like viruses. *Veterinary Pathology* (33): 343-346.
- Kim, D.Y., Mitchell, M.A., Bauer, R.W., Poston, R. and Cho, D.Y. (2002). An outbreak of adenoviral infection in inland bearded dragons (*Pogona vitticeps*) coinfecting with dependovirus and coccidial protozoa (*Isospora* sp.). *Journal of Veterinary Diagnostic Investigation* (14): 332-334.
- McAlpin, S. (1995). Notes on the Central bearded dragon *Pogona vitticeps* in Central Australia. *Victorian Herpetological Society Incorporated "Monitor"* (6)(3): 111-115.
- Mitchell, M.A. (2007). Biology and medicine of bearded dragons. *Proceedings of the North American Veterinary Conference* (21): 1592-1594.
- Read, J. and Bowen, Z. (2001). Population dynamics, diet and aspects of biology of feral cats and foxes in arid South Australia. *Wildlife Research* (28): 195-203.
- Seebacher, F. and Franklin, C.E. (2011). Prostaglandins are important in thermoregulation of a reptile (*Pogona vitticeps*). *Proceedings of the Royal Society* (270): 50-53.
- Wilson, S. and Swan, G. (2003). *A complete guide to reptiles of Australia*. Reed New Holland Publishers, Australia.
- Witten, G.J. (1993). No. 29 Family Agamidae. *Fauna of Australia*. Volume 2A. AGPS Canberra.
- Witten, G.J. and Coventry, A.J. (1990). Small *Pogona vitticeps* (Reptilia: Agamidae) from the Big Desert, Victoria, with notes on other *Pogona* populations. *Proceedings of the Royal Society of Victoria* (102)(2): 117-120.

## 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>
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		
<b>Total Commodity Damage Score (TCDS)</b>				<b>0</b>

## APPENDIX B: ASSIGNING SPECIES TO THREAT CATEGORIES

<b>A: Danger posed by individual animals</b> (risk a captive or escaped individual would harm people)	<b>B: Likelihood of establishment</b> (risk that a particular species will establish a wild population in Tasmania)	<b>C: Consequence of establishment</b> (risk that an established population would cause harm)	<b>Threat category</b>	<b>Implications for any proposed import into Tasmania</b>
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 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	Moderate	Import restricted to those license 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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