

## *Pseudemoia pagenstecheri* (VVP form) Tussock Skink

### Taxonomy

*Pseudemoia pagenstecheri* (Lindholm, 1901)

Based on work by Maggie Haines (Haines et al. 2014) the populations on the Victorian Volcanic Plains (VVP) are considered to be distinct from those in the east of the State. This assessment considers only the VVP populations.

### Current conservation status

Categorised as Vulnerable in the 2013 Advisory list of threatened vertebrate fauna in Victoria (DSE 2013).

### Proposed conservation status

Endangered in Victoria

Criteria A3ce+4ce

### Species Information

#### Description and Life History

The Tussock Skink is a prominently striped species, a characteristic often seen as an adaptation to grassy microhabitats. It is greyish-brown to olive brown on the back and head, with a dark brown vertebral line and usually two or more dark paravertebral lines. Lowland populations are usually heavily flecked with white and dark spots on the back and tail. There is a characteristic cream dorso-lateral stripe centred along the fourth or between the third and fourth scale row from the centre of the back - often dark-edged, this stripe starts on the base of the tail, running forward to the neck but not onto the head. There is an immaculate, broad, brown upper lateral zone, with a continuous, smooth, dark-edged mid-lateral pale stripe along the upper lip to the top of the ear then continuing behind the ear along the body onto the tail. This pale mid-lateral stripe becomes orange to red in breeding males, usually from behind the forelimb extending back onto the sides of the tail. The ventral surfaces are whitish, sometimes pale grey or bronze posteriorly.

From Robertson and Coventry (2019): The Tussock Skink is a diurnal heliotherm, basking on fallen timber, rocks or within grass tussocks. Mating occurs in winter, and ovulation and fertilization of the eggs occurs the following spring, with the live young born in early summer to early autumn. Females in lowland populations have three to eleven young.

#### Generation Length

The generation length of the Tussock Skink is suspected to be 2 to 4 years. Longevity and age at first reproduction is unknown for this taxon. Sexual maturity is assumed to be attained at around one year, and individuals are assumed to live for around 5 years.

#### Distribution

The taxon occurs on Victorian Volcanic Plains (VVP), extending from north and west of Melbourne to the Casterton area.

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## Habitat

Predominantly terrestrial, the Tussock Skink is usually found in grassy, treeless areas, and often in association with rocks (Robertson and Coventry 2019). The lowland population occurs in grassy ecosystem habitats of the warm temperate zone in the VVP.

## Threats

The taxon used to be ubiquitous across the VVP, but has undergone severe habitat loss. The taxon's habitat continues to be cleared. Anecdotal reports suggest catastrophic losses across much of the range, even in relatively intact habitats. The VVP have been largely cleared, so the few extant populations are typically persisting in small and usually isolated remnants.

While some of the causes of reduction are understood (destruction, degradation and fragmentation of habitat), there have been enigmatic losses in some of the remaining areas of habitat. The taxon persists in some areas but there has been an apparent recent, widespread population decline. based on incidental surveys by Clemann and Robertson (pers. obs.; part of Grassland Earless Dragon rock-rolling surveys; camera trapping for other reptiles). In many remnant patches on the VVP, introduced unpalatable invertebrates are removing food sources and dominate invertebrate biomass at the expense of previous prey taxa.

Ongoing loss of habitat, and apparent loss of this species from some remnant habitats, suggests that outright loss from the VVP could occur in a relatively short time period.

Small population size also constitutes a threat.

## IUCN Criteria

Criterion A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered	Endangered	Vulnerable
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p style="text-align: center;"><i>based on any of the following:</i></p> <p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>			

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## Evidence:

### Eligible under Criterion A3 as Endangered

The population reduction over the next 10 to 12 years is suspected to be 20 to 50%, based on (c) and (e) above.

The taxon's habitat continues to be cleared, and anecdotal reports suggest catastrophic losses across much of the range, even in relatively intact habitats. Ongoing loss of habitat, and apparent loss of this species from some remnant habitats, suggests that outright loss from the VVP could occur in a relatively short time period.

### Eligible under Criterion A4 as Endangered

The population reduction over any 10 to 12 year period, including both past and future, is suspected to be 20 to 50%, based on (c) and (e) above.

Past habitat declines have been well documented. Habitat continues to be cleared, and it is plausible that severe declines and losses will continue.

The causes of reduction may not have ceased, be understood or be reversible.

Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy)			
	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

## Evidence:

### Eligible under Criterion B as Vulnerable

The Area of Occupancy (AoO) is estimated to be 864 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them, the subpopulations can be considered to be severely fragmented.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the ongoing destruction, degradation and fragmentation of this taxon's VVP habitat, as well as enigmatic declines in remnant habitat.

The taxon has not been found in places where it was formerly common, even in the few areas where there is relatively intact habitat (P. Robertson pers. comm.).

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Criterion C. Small Population size and decline				
		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b)	Extreme fluctuations in the number of mature individuals			

## Evidence:

### Ineligible under Criterion C as Data Deficient

There is insufficient evidence to determine the number of mature individuals. Although have been no particular surveys and monitoring targeting this taxon, anecdotal reports suggest catastrophic losses across much of this taxon's range, even in relatively intact habitats. The VVP have been largely cleared, so the few extant populations are typically persisting in small and usually isolated remnants.

Criterion D. Very small or restricted populations				
		Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)		< 50	< 250	< 1,000
D2. Only applies to the VU category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time.		-	-	D2. Typically: AoO < 20 km <sup>2</sup> or number of locations ≤ 5

## Evidence:

### Ineligible under Criterion D

There is insufficient evidence to determine the number of mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

## References

DSE (2013). *Advisory List of Threatened Vertebrate Fauna in Victoria - 2013*. Department of Sustainability and Environment, Melbourne. Retrieved from:



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[https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0014/50450/Advisory-List-of-Threatened-Vertebrate-Fauna\\_FINAL-2013.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0014/50450/Advisory-List-of-Threatened-Vertebrate-Fauna_FINAL-2013.pdf)

Haines, M. L., Moussalli, A., Stuart-Fox, D., Clemann, N., and Melville, J. (2014). Phylogenetic evidence of historic mitochondrial introgression and cryptic diversity in the genus *Pseudemoia* (Squamata: Scincidae). *Molecular phylogenetics and evolution*, 81, 86-95.

Robertson, P. and Coventry, A. J. (2019). *Reptiles of Victoria: a Guide to Identification and Ecology*. CSIRO Publishing. Clayton South