Threatened Species Assessment

Lissolepis coventryi
Swamp Skink

Taxonomy

Lissolepis coventryi (Storr, 1978)

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* as *Egernia coventryi* (SAC 2000).

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

Proposed conservation status

Endangered in Victoria

Criteria A2ace+3bce+4abce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

From Robertson and Coventry (2019): The Swamp Skink is a deep-bodied but elongate lizard, with well-developed pentadactyl limbs that overlap when adpressed, and a long thick tail. The head is noticeably larger in males and is often scarred from conflicts with other individuals. This species is pale yellowish or greenish brown to dark olive-brown on the back, head and tail, with the front of each scale variably edged in black, and often many black patches on the head. Usually, there are two broad, jagged-edged black stripes along the back, not extending onto the tail. The upper sides are black, with many small cream to yellowish spots, and the lower sides are finely variegated greenish yellow-brown with pale flecks. The sides of the head and throat may have an olive greenish tinge, and there is usually a prominent cream stripe on the upper lip.

A largely terrestrial species, the Swamp Skink is a capable swimmer, and sometimes climbs up to two metres high in dense sedges to reach suitable basking sites. It is diurnal, sheltering in burrows when inactive, either dug by the skinks themselves or in those constructed by crustaceans. The Swamp Skink feeds on a wide variety of invertebrates, such as spiders, beetles, moths, ants, bugs and crustaceans, with plant material (including fungus) also being important in the diet. It is viviparous, mating in early spring, with a single litter of two to four live young born in January or February (Clemann et al. 2004).

Generation Length

The generation length of the Swamp Skink is suspected to be 5 to 10 years. Mark-recapture studies (P. Robertson unpublished data) suggest that this taxon is relatively long-lived. Sexual maturity is probably attained at around 3 years of age.

Distribution

The Swamp Skink is widely but disjointly distributed throughout southern Victoria, from East Gippsland through to Nelson in the south-west, and as far inland as the Grampians.

Habitat

A species of the Cool and Warm Temperate Bassian sub-zones, the Swamp Skink is restricted to swampy habitats within the Damp Sclerophyll Forest, Riparian Forest, Heathland and Saltmarsh ecosystems. Specialized for life in dense, damp vegetation often dominated by sedges, reeds or *Melaleuca* species, it often lives in areas that may

become inundated at times. It can even survive in the intertidal zone within saltmarshes (Robertson and Coventry 2019).

Threats

The taxon is threatened by habitat fragmentation as a result of removal of habitat, leading to severe fragmentation of subpopulations that are consequently vulnerable to detrimental impacts from both deterministic and stochastic processes (Clemann 2015). The habitat for this taxon is under threat through the removal and draining of swamps, wet heath, riparian vegetation and salt-marsh (Clemann 2015). Drainage of swamps in particular is a problem. Threats are most severe over the southwestern two thirds of the range (Robertson 1998). In this area this taxon is associated mainly with coastal and lowland areas that have generally been subject to the greatest levels of habitat modification for agricultural development, and most of the 76 localities known from 1998 are subject to ongoing threats (Robertson 1998).

In areas west of the Snowy River, impacts are likely to be lesser and G. Gillespie (pers. comm. 2017) reported that there had been "hardly any" habitat loss in the East Gippsland area over the past 20 years. Nevertheless, there is some level of disturbance due to past forestry activities, while other threats in this area are intensifying (N. Clemann and P. Robertson pers. comm. 2017). Invasive species, principally feral herbivores, may represent a major threat in this area; recent surveys of feral animals found "significant increase ... since the last similar survey in 2009" in most feral animals in East Gippsland (S. Henry pers. comm. 2017) and extensive damage to natural habitats in this area has been observed. Sambar Deer (*Rusa unicolor)*, an invasive species which has been considered a major pest in Victoria for ten years, are particularly associated with the degradation of wetland areas, reducing mossy or swampy areas to "mud pools" (Ingamells 2017) and it is not clear whether the resulting habitats can support this skink (N. Clemann and P. Robertson pers. comm. 2017).

Spatial analysis of likely habitat on all land tenures for the taxon indicates that 32% occurs within the CAR reserve system, including parks and reserves, special protection zones and areas excluded from harvesting by prescription under the Victorian Code of Practice for Timber Production 2014 (the Code). Species-specific protections for the taxon are included in the Code for Portland Horsham FMA. General forestry prescriptions such as protection and buffering of waterways also provide protection from forestry operations.

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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Eligible under Criterion A2 as Endangered

The population reduction over the past 15 to 30 years is inferred to be 45 to 60%, based on (a), (c) and (e) above.

The habitat of this taxon has been subject to loss and degradation in many areas. Causes of loss include residential, industrial and agricultural development and roading. Development and roads create barriers between populations.

The East Gippsland range of the taxon was the most intact and connected area of habitat. Parts of this were burnt in the bushfires of 2019/20, and its swampy, riparian and heathy habitats were probably burnt intensely. Most swamp habitat was burnt and animals were killed. Some survivors were found after the fires, but some swamps were surveyed without success. Following the fires, with loss of shelter survivors would have been vulnerable to feral predators.

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

Eligible under Criterion A3 as Endangered

The population reduction over the next 15 to 30 years is inferred to be 30 to 50%, based on (b), (c) and (e) above.

The habitat of this taxon continues to be subject to loss and degradation, from drying of its preferred swampy habitat, urban growth pressures and frequent fires, leading to an expected loss of numbers. Survivors of the 2019/20 bushfires might be subject to inbreeding, and further inroads by introduced predators.

Eligible under Criterion A4 as Endangered

The population reduction over any 15 to 30 year period, including both past and future, is inferred to be 35 to 55%, based on (a), (b), (c) and (e) above.

Past and future declines are a result of ongoing habitat loss and degradation.

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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 496 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented, as it is a habitat specialist and therefore likely had a naturally disjunct distribution. However, loss and fragmentation of habitat has extremely exacerbated this disjunction.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above. Habitat extent and quality continue to be lost and degraded, and some remaining small populations may not be viable.

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

It is inferred that there are 1,000 to 2,400 mature individuals, but this qualifier is too weak to meet this criterion.

Criterion D. Very small or restricted population			
	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 km2 or number of locations ≤ 5

Evidence:

Eligible under criterion D2 as Vulnerable

The taxon is inferred to be very restricted.

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

References

Clemann, N., Chapple, D. G. and Wainer, J. (2004). Sexual dimorphism, diet and reproduction in the Swamp Skink, *Egernia coventryi*. *Journal of Herpetology* 38(3): 461-467.

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

Robertson, P. (1998). *Egernia coventryi* Swamp Skink - Nomination for Listing on Schedule 2 of the Flora and Fauna Guarantee Act, 1988. Unpublished report to the Department of Natural Resources and Environment, Victoria, by Wildlife Profiles, Melbourne.

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

SAC (2000). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 468 *Egernia coventryi.*