



Eulamprus kosciuskoi Alpine Water Skink

Taxonomy

Eulamprus kosciuskoi (Kinghorn, 1932)

Recent synonym *Sphenomorphus kosciuskoi*

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1992).

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

Proposed conservation status

Endangered in Victoria

Criteria A2ace+3ce+4ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

From Robertson and Coventry (2019): This is the smallest of Victoria's water skinks, with a shorter and more robust body shape. The head, body and tail are coppery brown, often with a greenish tinge. While the head is without or has only a few dark markings, the back often has darker speckling, there is a black vertebral line, and often a fine dark dorso-lateral line above a yellow line, from the neck to the base of the tail. The Alpine water -skink grows to about 80 mm snout-vent length.

The taxon feeds on a variety of invertebrates. Mating occurs in spring, after which the females give birth to between one and six live young in late summer or early autumn.

Generation Length

The generation length of the Alpine Water Skink is inferred to be 4 to 7 years. Longevity in the wild of this taxon is assumed to be around 8 years, and successful recruitment tends to be from older animals.

Distribution

The Alpine Water Skink has a disjunct distribution, being restricted to isolated areas of suitable habitat within the cold temperate zone above 1300 metres elevation. Only occurring in the Alpine ecosystem, it is usually found in association with sphagnum bogs (Robertson and Coventry 2019).

Habitat

The Alpine Water Skink in Victoria occurs predominantly near the margins of small alpine watercourses and sphagnum bogs, where it basks on rocks, grass tussocks and sphagnum moss, not hesitating to plunge into the icy water if pursued. It constructs and shelters within burrows under sphagnum and rocks, overwintering in these refuges.

Threats

The taxon is threatened by habitat destruction, fragmentation and degradation by human activities, exacerbated by climate change and the impacts associated with climate change (e.g., invasive species, worsening fire regimes, deleterious thermal events). Numbers have declined due to ongoing degradation of the sensitive sphagnum bog habitat due to cattle and feral herbivores (horses, deer and pigs).

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>based on any of the following:</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 A2 as Endangered

The population reduction over the past 12 to 21 years is inferred to be 30 to 50%, based on (a), (c) and (e) above.

Numbers have declined due to ongoing impacts from feral species, and habitat destruction, fragmentation and degradation by human activities, exacerbated by climate change and the impacts associated with climate change (e.g., invading species, worsening fire regimes, deleterious thermal events and regime, etc.).

Since the Alpine Water Skink occurs in the high elevation plains in the eastern alps, perhaps 50% of its range was impacted during the 2019/20 bushfires. Although the burnt areas have not been accessed, it is thought that up to 60% of Davies Plain was burnt and a significant area of Forlorn Hope Plain. If animals survived the fires there would almost certainly have been heavy pressure on the habitat from feral horses that had escaped the fires, especially in any unburnt refugia where there was still grass.

Eligible under Criterion A3 as Endangered

The population reduction over the next 12 to 21 years is projected to be 30 to 50%, based on (c) and (e) above.

A significant reduction is predicted, based on habitat destruction, fragmentation and degradation and impacts of feral herbivores. Much of the vegetation the animals depend on does not recover well after fire, and the smaller

population size following the 2019/20 fires increases the animals' vulnerability. Areas of unburnt habitat could be affected by future fires.

Eligible under Criterion A4 as Endangered

The population reduction over any 12 to 21 year period, including both past and future is inferred to be 30 to 50%, based on (a), (c) and (e) above. 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 ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 2,726 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented. The taxon tends to occur in discrete bog systems or narrow riparian zones isolated from the next closest occupied areas. Because of its fragmented distribution, the impacts of a range of threats may severely impact subpopulations, such that if one disappears it may not be able to naturally recolonise.

It is estimated to have 2 locations. There are essentially two clusters of sites for this taxon in Victoria, either side of the Omeo valley. Experience in recent decades has shown that threats such as 'megafires' and feral horses can readily affect all individuals of this taxon.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 192 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is severely fragmented, has 2 locations and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

Eulamprus kosciuskoii Alpine Water Skink

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 500 to 5,000 mature individuals, but this qualifier is too weak to meet this criterion.

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 ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Vulnerable

The taxon is estimated to be very restricted.

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

References

DSE (2003). Action Statement - Alpine Water Skink *Eulamprus kosciuskoii* (No. 114). Department of Sustainability and Environment, East Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0018/32391/Alpine_Water_Skink_Eulamprus_kosciuskoii.pdf

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Eulamprus kosciuskoi Alpine Water Skink

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

SAC (1992). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 222 *Sphenomorphus kosciuskoi*