



## *Leptoperla kallistae* Kallista Flightless Stonefly

### Taxonomy

*Leptoperla kallistae* Hynes 1974

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2007).

Categorised as Critically endangered in the 2009 Advisory list of threatened invertebrate fauna in Victoria (DSE 2009).

### Proposed conservation status

Critically Endangered in Victoria

Criteria B1ab(iii)+2ab(iii)

### Species Information

#### Description and Life History

No direct data are available for this taxon. Hynes (1974) considered it a sub-species of *Leptoperla kimminsi*, which showed continuous development at two sites in Victoria (Hynes and Hynes 1975). Adults were present all year at these sites and Hynes and Hynes (1975) were unable to estimate the length of the larval life. *L. kallistae* probably has a life span of at least 6 months. Adults are wingless, so have low dispersal ability.

#### Generation Length

The generation length of *Leptoperla kallistae* is suspected to be 6 months. There is very limited records and knowledge about the taxon, so the generation length is based on the life span.

#### Distribution

The taxon is only known from Sassafras Creek and Monbulk Creek within 1 km of Kallista, Victoria.

#### Habitat

The taxon is known to inhabit permanent rivers, streams and creeks.

#### Threats

There has been no record of the species since 1975 despite widespread sampling in the area. If it still exists, the known population is likely to be very small and isolated and at risk from on-going climate change, fire and grazing, such that there is increased extinction risk and little or no probability of recolonisation should the populations become extinct.

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### 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> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

### Evidence:

#### Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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			

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### Evidence:

#### Eligible under Criterion B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

Individuals of the taxon are suspected to be severely fragmented, considering the limited dispersal ability of the individuals, the barriers to dispersal, or lack of habitat separating them, such that there is increased extinction risk and little or no probability of recolonisation should the populations become extinct

It is inferred to have a continuing decline in (iii) above, as a result of on-going climate change, fire and grazing.

#### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, and has a continuing decline in (iii) above.

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

No reliable estimate of the total population size for the taxon is available. The taxon has not been recorded since 1975.

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



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## 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

DSE (2009). *Advisory list of threatened invertebrate fauna in Victoria - 2009*. Department of Sustainability and Environment, Melbourne.

Hynes, H.B.N. (1974) Comments on the taxonomy of Australian Austroperlidae and Gripopterygidae (Plecoptera). *Australian Journal of Zoology Supplement*, 29, 1-36.

Hynes, H.B.N. and Hynes, M.E. (1975). The life histories of many of the stoneflies (Plecoptera) of south-eastern mainland Australia. *Australian Journal of Marine and Freshwater Research*, 26, 113-53.

SAC (2007). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 7697 *Leptoperla kallistae*.