

## *Allocharopa erskinensis* Land Snail

### Taxonomy

*Allocharopa erskinensis* (Gabriel, 1930)

*Allocharopa erskinensis* is also accepted as *Bonhamaropa erskinensis*.

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2002).

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

### Proposed conservation status

Vulnerable in Australia

Criteria B1ab(iii,v)+2ab(iii,v)

### Species Information

#### Description and Life History

The invertebrates of the Otway Ranges are not very well known. The researches that have been done are not comprehensive to understand the range or diversity of species dependant on, or endemic to, the Otway Ranges. Only a few conspicuous species are readily identified and of these several are known to be endemics.

There are at least three other endemic snails, tiny leaf-litter inhabitants rarely seen even by people deliberately searching for them. None has a common name. They are *Pernagera gatliffi*, *Geminoropa scindocataracta* and *Allocharopa erskinensis*.

#### Generation Length

The generation length of *Allocharopa erskinensis* is estimated to be 2 to 4 years. The age of mature snails can be estimated from growth interruption markings on the shell. The estimation across a broad selection of charopids is that they do not live longer than 3 years.

#### Distribution

The taxon has a very restricted distribution across the Wet Forest within the Otway Ranges.

#### Habitat

The taxon occurs in Cool Temperate Rainforest and Wet Forest.

#### Threats

Historic declines have been caused by land clearing and forestry operations. It should be noted that native forest timber harvesting on public land has been phased out in the Otway Ranges since 2008 although small scale community forestry continues. Harvesting on private land and in plantations continues in parts of its range. It should be noted that the Code of Practice for Timber Production 2014 applies to the management of plantations on public and private land, including the requirement to protect and buffer rainforest and waterways.

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Current threats such as climate change are not well understood but are considered to be important factors underpinning long term trends in declines or recovery. Increased fire frequency and intensity are significant threats to the taxon's rainforest habitat.

### 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

Population reductions over the past or future 10 to 12 years are suspected to be less than 30%.

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 B1 as Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is 1195 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). However the Otways area is greatly under surveyed, especially for chaopids, as surveying can be difficult if workers are not experienced in surveying for micro-snails. The best estimate is based on a proxy of the combined area of the two broad vegetation classes "Rainforest" and "Wet or Damp Forests" for this region, giving a figure of approximately 842 km<sup>2</sup>.

The taxon is suspected to have up to seven locations. It is unlikely that a single fire could significantly affect all individuals, although fires are a threat across the taxon's range, and the future effects of climate change are likely to operate at varying intensities, depending on the local habitat of the taxon.

and has a continuing decline in (iii) and (v) above, based on the threat of climate change, with preliminary predictions being for a notable reduction of such habitat types by 2080 (Miles 2010).

While two distinct phylogroups are delineated based on mt DNA, it is not suspected that populations are fragmented and dispersal of between regions limited. The recognition of two clades is more reflective of past fragmentation during the earlier periods in the quaternary, that is, it is reflective of ancestral polymorphism rather than limited dispersal and gene flow.

#### Eligible under Criterion B2 as Vulnerable

The Area of Occupancy (AoO) across the taxon's range is estimated to be 40 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. This is likely to be an under-estimate.

As above, the taxon has up to seven locations and a continuing decline in (iii) and (v) 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

It is estimated that there are 20,000 to 30,000 mature individuals, which exceeds the thresholds for criterion C.

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

It is estimated that there are 20,000 to 30,000 mature individuals.

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.



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Miles, V. F. (2010). Quantifying and Assessing Uncertainty in Climate Change Projections for Cool Temperate Rainforests of South-eastern Australia. MSc. University of Melbourne.

SAC (2002). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 580 *Allocharopa erskinensis*.

Stanisic, J; Shea, M; Potter, D; Griffiths, O. (2017). *Australian Land Snails Volume 2 - A field guide to southern, central and western species*. Biocultural Press Mauritius.