

Leptocerus souta Caddisfly

Taxonomy

Leptocerus souta Mosely, 1953

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criterion B2ab(v)

Species Information

Description and Life History

Leptocerus is one of the smallest genera in the Leptoceridae, both in the number of species and the size of larvae and adults. Only one species is recorded in Victoria. The genus generally has three life stages: egg, aquatic larvae and pupae and the terrestrial adult stage. The larvae have a case made solely of spun silk, the only Australian genus to do so. This case is about twice as long as the larva but very light weight and the larvae swim with them readily. *Leptocerus* and two other genera of Leptoceridae are known as the swimming caddis (Wiggins 2004), as they are able to swim by rapidly beating their long and hairy hind legs.

Leptoceridae are one of the largest families of caddisfly in Australia with 15 genera and 144 species; globally there are over 2020 species of long-horned caddis (Morse 2009. Holzenthal *et al.* 2015). All but one species of the Leptoceridae lay their eggs in the water. Emergence occurs in October through to May depending upon the species, with pupation typically the shortest stage of the lifecycle. Most Leptoceridae species are univoltine (1 generation per year), but some are semi-, bi- or multi-voltine. Warmer summer water temperatures and or the quality of food make it feasible for some species to increase their summer generation larval growth rates and for larvae to mature and pupate earlier, leading to additional generations (Holzenthal *et al.* 2015). They are collected over summer and each adult probably lives for several weeks.

Generation Length

The generation length of *Leptocerus souta* is inferred to be 6 to 12 months, based on other Australian Trichoptera taxa, as there is insufficient field observation of the taxon.

Distribution

The taxon's records are mainly in central and western Victoria but it may be more widespread. There is very little current information, with no recent targeted surveys being undertaken.

Habitat

The larvae are found in lakes and lowland streams with macrophytes. They are active swimmers in the water column among the macrophytes. Little is known of the habitat of the adults; they are probably in the riparian vegetation close to the larval habitat but may be able to fly some distance.

Museum records suggest it can opportunistically utilise lowland habitats and was reasonably widespread. There is very little current information, with no recent targeted surveys being undertaken.

Threats

A noticeable decline was found at two historical sites (St Clair 1994). The loss of the species in Lake Purrumbeet, where larvae had been extremely abundant, coincided with the introduction of trout into the lake. The active swimming of the larvae would make them particularly susceptible to predation by a new predator.

The taxon is significantly threatened by natural system modifications, dams and water management and use, as water abstraction would impact the number and water quality of the larval habitat in rivers. Other significant threats include invasive and other problematic species, such as the continued introduction of trout or other predatory species into environments that support the species may lead to future decline. In addition, other threats are posed by pollution, sewerage, run-off, agricultural and forestry effluents, nutrient loads, soil erosion and sedimentation, severe weather and climate change.

The taxon is also threatened to a moderate extent by livestock farming, small-holder and agro-industry grazing, and/or farming.

Some sites are within protected areas, including several sites within the Glenelg Estuary and Discovery Bay Ramsar site (DELWP 2017). Lake Moniboeng and Swan Lake support dense stands of macrophytes and good water quality. Threats to these locations include reduced water quality and declining water tables. Currently these lakes do not have introduced predatory fish (DELWP 2017).

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:

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.

There is no evidence to indicate whether the taxon has suffered significant past decline in the last 10 years. There was a considerable decline previously, coinciding with the introduction of trout many decades ago, but populations appear to have stabilised afterward.

Continued introduction of trout or other predatory species into environments that support the species may lead to future decline; however future decline cannot be estimated since it is unclear when identified threats are likely to result in significant decline in population size or any other demographic parameter.

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 B2 as Vulnerable

The Area of Occupancy (AoO) across the taxon's range is estimated to be 76 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

It is suspected to have 10 locations. It has a continuing decline in (v) above. Due to the operating threats, it is suspected that the population will continue to decline, due mainly to loss and reduced quality of habitat and the impact from introduced predatory fish.

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 current total population size of the species is available.

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:

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

DELWP (2017). Ecological Character Description for Glenelg Estuary and Discovery Bay Ramsar Site. Department of Environment, Land, Water and Planning, East Melbourne, Victoria.

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