



Synemon discalis Small Orange-spotted Sun Moth

Taxonomy

Synemon discalis Strand, 1911

Current conservation status

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

Proposed conservation status

Endangered in Victoria

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

Species Information

Description and Life History

There is strong circumstantial evidence to suggest that the larval food plant is *Gahnia lanigera* (Desert Saw-sedge, Cyperaceae). This is based on repeated observations (by F. Douglas) of females ovipositing into the soil against tillers at the base of this plant at two of the three Victorian localities where the taxon occurs/ed. Adults are diurnal and fly rapidly during periods of warm sunny weather. They usually fly within 1 metre of the ground and tend to stay close to occurrences of the larval food plant. The taxon is univoltine with adults on the wing during early to late October at the Hattah and Nowingi sites and a little later, late October to early November at the Big Desert site. At this site this taxon occurs sympatrically with *Synemon parthenoides* (Orange-spotted Sun-moth), a larger but similar looking species with which it can be easily confused.

Based on knowledge of congeneric species and the whereabouts of the few pupal exuviae that have been found, it is almost certain that larval development takes place within silk lined tunnels leading to the roots of the food plant on which the larvae feed. Subsequent pupation takes place in a more or less vertical silk lined tunnel which leads to the soil surface where its opening is covered with silk and surrounding soil particles and debris.

Generation Length

The generation length of the Small Orange-spotted Sun-moth is inferred to be 24 months. Little is known regarding the longevity or generation length of the taxon, but it is assumed to be similar to that of other congeners.

Distribution

Within Victoria this taxon is only known to occur at two localities: in the south-eastern corner of the Big Desert, occupying an area of about 2 ha and 6 km north of Hattah on the Calder Highway. This record is based on a single female collected in October 1995. There is a possibility that it may still occur at a site on the Calder Highway at 6km north of Hattah but it hasn't been seen during surveys since 2005.

Outside Victoria the Small Orange-spotted Sun-moth occurs in limited areas on the Yorke and Eyre Peninsulas in South Australia and at Mount Ragged and Norseman in Western Australia (E. D. Edwards pers. comm.). Common (1990) stated that the taxon is widely distributed in western Victoria and South Australia. However, this is an error as this species has a restricted distribution in South Australia and was not known to occur in western Victoria until 1995.

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Habitat

At the Big Desert site, the taxon occurs in low lying, open heathland on greyish-white sands. The dominant plant taxa at the one Victorian site are *Gahnia lanigera* (Desert Saw-sedge), *Lepidosperma carphoides* (Black Rapiersedge), *L. viscidum* (Sticky Sword-sedge), *Triodia scariosa* (Porcupine Grass), *Dampiera rosmarinifolia* (Rosemary Dampiera) and *Kunzea pomifera* (Muntries). Although trees and shrubs are scarce at the site there are a few specimens of *Eucalyptus leptophylla* (Narrow-leaf Mallee) and *Leptospermum coriaceum* (Green Tea-tree) near its margin.

At the Hattah site, the habitat is an undulating mallee community on a reddish, sandy soil. The most abundant mallee taxa at the site are *E. socialis* (Grey Mallee) and *E. costata* (Yellow Mallee). Although the ground flora is dominated by *T. scariosa*, the area also contains scattered occurrences of *G. lanigera*. Other plants that occur at the site include: *L. viscidum*, *Westringia rigida* (Stiff Westringia), *L. coriaceum* and *Baeckea behrii* (Broom Baeckea).

Threats

Inappropriate management, soil disturbance due to fire mitigation works would have a very serious impact on populations. Such management actions may even cause local extinction of the taxon. However, simultaneous fires at both of the extant sites during flight period would dramatically but only temporarily impact the populations.

Historically, it appears that the Small Orange-spotted Sun-moth would have had a more extensive distribution along the southern edge of the Big Desert. The wholesale clearing of natural vegetation that took place after Europeans settled the area seems to have brought this taxon to the brink of extinction in Victoria, as a result of habitat loss. Despite surveys carried out during the past three years at other (more northerly) sites where Desert Saw-sedge occurs in the Big Desert, no more populations have been found. The unusually large area of (particularly) healthy Desert Saw-sedge inhabited around Chinaman's Well Track seems to distinguish this site from other potential sites.

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

The past population reduction does not meet the threshold for eligibility under criterion A2. There is insufficient evidence to determine whether will be a future reduction in population size (criterion A3).

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 and B2 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 127 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) across the taxon's range is estimated to be 16 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

Considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them, the individuals can be considered to be severely fragmented.

It is estimated to have 2 locations, as each subpopulation may be variably affected by bushfire or stochastic events.

It has a continuing decline in (iii) and (v) above, as inappropriate management and soil disturbance due to fire mitigation works would have a very serious impact on populations and result in a continuing decline in the quality of habitat.

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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 800 to 1,000 mature individuals, but this qualifier is too weak to meet the threshold.

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 D2 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

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