

Microcybe pauciflora subsp. *pauciflora* Yellow Microcybe

Taxonomy

Microcybe pauciflora subsp. *pauciflora* Turcz.

Current conservation status

Categorised as Endangered in the 2014 Advisory list of rare or threatened flora (DEPI 2014).

Proposed conservation status

Critically Endangered in Victoria

Criteria A2bc+4bce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C1+2a(i)

Species Information

Description and Life History

Shrub to 60 cm high; branchlets smooth, densely silvery stellate-hairy. Leaves spreading, petiolate, 4-8 mm long, c. 1 mm wide, apex rounded, adaxial surface glandular-punctate, sparsely scabrous from persistent hair-bases, margin revolute. Inflorescence c. 5-12-flowered. Sepals free, narrow-oblong, c. 1 mm long, densely stellate-hairy abaxially; petals narrow-ovate, 2.5-3 mm long, bright yellow, glabrous or sparsely ciliate towards base; stamen filaments stellate-ciliate toward base. Follicles c. 4 mm long, glabrous or with scattered hairs, pitted; seed c. 2-3 mm long, black. The taxon flowers in spring and summer (VicFlora 2019).

Members of the Rutaceae have long lived hard seeds, and many need fire to crack the seeds. The soil seedbank is long-lived, and aren't easily transported except by ants. There may be some low level opportunist recruitment from occasional seed germination, but new growth tends to be picked off by browsers such as kangaroos and wallabies.

Generation Length

The generation length of *Microcybe pauciflora* subsp. *pauciflora* is estimated to be 15 to 50 years. The taxon recruits episodically in response to fire, at a pre-settlement fire interval of 15 to 20 years in the western Wimmera. In the Lowan Mallee, fire intervals are likely to have been longer, at 35 to 50 year intervals. The taxon occupies much the same habitat as Malleefowl, which require long intervals between fire to allow litter to accumulate to build their mounds.

Distribution

The taxon is very rare in Victoria and currently known from only two sites near Ouyen; Bronzewing Flora and Fauna Reserve near the intersection of Torney Rd and Shean Rd about 6.7 km west of Gypsum; and Gypsum Road, c.12 km west from Gypsum siding at the Henty Hwy, c. 20km south-east from Ouyen. The taxon was previously known from a 1916 collection at Murrayville and Ngallo, and an earlier collection from near Lake Albacutya. The taxon is also present in Western Australia and South Australia.

Habitat

At the site west of Gypsum, the plants grow on beige sandy loam with abundant limestone. Associated species include *Eucalyptus socialis* (Grey Mallee), *E. calycogona* (Red Mallee), *Triodia scariosa* (Porcupine Grass), *Westringia rigida* (Stiff Westringia), *Beyeria lechenaultii* (Pale Turpentine-bush), *Myoporum platycarpum* (Sugarwood), *Eutaxia microphylla* (Common Eutaxia), *Melaleuca uncinata* (Broombush) and *Halganina cyanea*

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(Rough Halgania). Plants are growing beside the road and some extend into the reserve away from the road. At the second site, 12.5 km west of Gypsum, the *Microcybe* also occurs in *Eucalyptus socialis* vegetation and is strictly limited to the roadside.

Outside of Victoria, the taxon is usually found on calcareous soils.

Threats

Both populations are at significant risk from future road widening or other roadside management activity. The subpopulation 12 km west of Gypsum, because it is confined to the roadside, is at risk of eradication. In 2000, road widening was observed at the site 12km west of Ouyen. In 2009, road widening and destruction of some plants was also observed at the site 6.5 km west of Gypsum (V. Stajsic pers. observ.).

Too-frequent fires risk exhaustion of the seedbank, and recruitment failure. Weed invasion particularly in the population at the site 12 km west of Gypsum is another potential threat.

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"> (a) direct observation [except A3] (b) an index of abundance appropriate to the taxon (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat (d) actual or potential levels of exploitation (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites 			

Evidence:

Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 45 to 150 years is suspected to be 50 to 85%, based on (b) and (c) above.

It is likely that the population size would have declined by at least 80% over the last century, based on the historically large areas of native vegetation cleared in the region. Most of the Bronzewing Flora Reserve is unsuitable for the taxon because limestone is much rarer around the area.

The causes of the reduction may not have ceased, be understood or be reversible.

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Eligible under Criterion A3 as Endangered

The population reduction over the next 45 to 100 years is suspected to be 50 to 75%, based on (b), (c) and (e) above.

It is likely the two populations will continue to decline in the future due to ongoing inappropriate road widening work. The population 12 km west of Gypsum is surrounded by agricultural land on both sides of the road and is at greater threat.

Eligible under Criterion A4 as Critically Endangered

The population reduction over the any 45 to 150 year period, including both past and future (up to 100 years in the future) is suspected to be 60 to 85%, based on (b), (c) and (e) above.

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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 21 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

The taxon is inferred to be severely fragmented. Both subpopulations are separated by a distance beyond the dispersal distance of the taxon, as it relies mostly on movement of ants to spread the seed, and both are highly precarious

It is estimated to have two locations. All known individuals are in two small subpopulations and a single catastrophic event such as extensive road widening or vegetation clearing could destroy an entire subpopulation.

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

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VVA. As above, it is severely fragmented, has 2 locations and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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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:

Eligible under Criterion C1 as Critically Endangered

It is estimated that there are 60 to 80 mature individuals, based on field observations that observed that at the site 6.5 km west of Gypsum road, the number of plants was estimated at ca. 30 in 2009, and the site 12 km west of Gypsum, the number of plants was estimated at about 30 in 2000.

A continuing decline of 20 to 30% is estimated to occur within one generation.

Eligible under Criterion C2 as Endangered

It is estimated that there are 60 to 80 mature individuals, the number of mature individuals is estimated to continue to decline, and the number of mature individuals in each subpopulation is fewer than 250.

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 Endangered

It is estimated that there are 60 to 80 mature individuals.

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



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References

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne. Retrieved from:

https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Microcybe pauciflora subsp. pauciflora*.

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