

Philotheca myoporoides subsp. *euroensis* Euroa Wax-flower

Taxonomy

Philotheca myoporoides subsp. *euroensis* M.J. Bayly

Current conservation status

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

Proposed conservation status

Critically Endangered in Australia

Criteria B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(i,ii); D

Species Information

Description and Life History

The taxon is a shrub to c. 1 m high. Leaves broad-elliptic, 15–35 mm long, 6–12 mm wide, distinctly concave above to conduplicate, midrib indistinct on lower surface, apex obtuse. Inflorescences 1–4-flowered; peduncles 0–7 mm long. Flowers May–November (VicFlora 2016).

Generation Length

The generation length of *Philotheca myoporoides* subsp. *euroensis* is inferred to be 25 to 80 years. This is based on a plausible longevity of the same interval, and that there is likely post-fire pulse recruitment after a plausible pre-settlement fire frequency in the range 25-50 years. It has been observed to recruit successfully post-fire at Mt Wombat.

Distribution

The taxon is known only from an area near Euroa in Victoria, specifically, Garden Range (Bayly 1998). There are relatively localised pockets of suitable habitat in this area and the taxon is apparently rare.

It is known only from four collections, and these were presumably taken within a few kilometres of each other, with two certainly being from the same plant. A limited field search over two days found only a single plant, with a more extensive study within this area revealing a second plant nearby. However, it appears this latter plant has since died. Further surveys in this and surrounding areas are required to determine the size and the distribution of subpopulations.

Habitat

The taxon grows in shallow soil among granite boulders.

Threats

The taxon is at increasing risk of recruitment failure in response to extreme drought stress and the increasing frequency and intensity of fires, and the potential impact of both indigenous and exotic browsers on young plants. Browsing is generally low in Rutaceae however it is possible that young plants may be targeted by grazers at the recruitment stage. In addition, there are stochastic risks to exceedingly small subpopulations, such as the single plant apparently surviving at the type location.

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Euroa Wax-flower

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 style="text-align: center;"><i>based on any of the following:</i></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:

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.

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Euroa Wax-flower

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 8 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to be severely fragmented both naturally and anthropogenically at the landscape scale. Plants in the Rutaceae family in general tend to have a heavy seed with no known dispersal mechanisms other than potential for myrmecochory, and hence, have a very restricted opportunity for recolonisation following local extinction.

It is estimated to have 1 location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the current and projected impact of the identified threats, such as drought stress and increasing frequency and intensity of fires.

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 VBA.

The AoO is based on 2 recent records, the type in the Garden Range, west summit 2 km south of Waterhouse Reservoir, and Mt Wombat. The taxon is likely to be locally extinct at a third location, on a property at Kelvin View, 7 miles south-east of Euroa, collected by Willis in 1951.

As above, the taxon is estimated to be severely fragmented, is estimated to have 1 location, 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 C2 as Critically Endangered

It is estimated that there are 30 mature individuals. This is based on a small patch of an estimated 30 plants in a 5x5 metre area at Mt Wombat, and a single plant at the type locality 2 km south of Waterhouse Reservoir. A second plant at the type locality has reportedly become extinct (Bayly 1998).

The number of mature individuals is estimated to continue to decline due to the identified threats, the number of mature individuals in each subpopulation is 50 or fewer, and the percentage of mature individuals in one subpopulation is 90-100%.

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 Critically Endangered

The taxon is estimated to have 30 mature individuals.



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

References

Bayly, M.J. (1998). Notes on *Eriostemon myoporoides* (Rutaceae) species complex, including new names and a new generic placement in *Philotheca*. *Muelleria*, 11, 113-126.

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 (2016). Flora of Victoria, Royal Botanic Gardens Victoria: *Philotheca myoporoides* subsp. *euroensis*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/9fece315-6a30-4b97-b814-dad5881ad676>