

## *Australina pusilla* subsp. *pusilla* Small Shade-nettle

### Taxonomy

*Australina pusilla* subsp. *pusilla* (Poir.) Gaudich.

*Australina pusilla* subsp. *pusilla* and *A. pusilla* subsp. *muelleri* were regarded as separate species until 1988. However, they are specifically distinct on a number of criteria and should be reinstated as separate species.

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criterion B2ab(i,ii,iii,iv,v)

### Species Information

#### Description and Life History

The taxon has stems to 4 cm high and 0.5(–1.0) mm diam.; young stems and petioles with stiff, appressed hairs or occasionally also with finer, more erect hairs. Leaf-lamina more or less circular, to 11 (rarely to 15) mm long and 12 (rarely 16) mm wide, length to width ratio 0.8–1.2; margin with 2–3 (rarely 1–4) blunt or rounded teeth on each side; apical tooth almost always wider than long; both surfaces usually glabrous (but may be lines of appressed hairs between veins and scattered appressed hairs on veins). Male inflorescences with peduncle to 6 mm long. Male flowers 2 (rarely 1 or 3). Female flowers 1–4 (rarely 9). The taxon flowers from October to January (VicFlora 2018).

The taxon is a small, fleshy, facultative annual (where it is seasonally droughted) or short-lived perennial (2–5 years); prostrate or weakly erect. The taxon reproduces only by seed, or rarely, vegetatively. Recruitment is continuous from a soil-stored seedbank of unknown longevity, but it is likely to be considerable based on the behaviour of the congeneric *A. pusilla* subsp. *muelleri* (McMahon 1987). The flower is male and female on the same plant and it is pollinated by wind after explosive release of pollen from male flowers to female flowers. Seeds ripen in about eight weeks. Seed dispersal is passive, and most are assumed to be deposited around or near the parent plant. The taxon is highly fire sensitive and recovering from the soil-stored seedbank.

#### Generation Length

The generation length of *A. pusilla* subsp. *pusilla* is suspected to be 2 to 5 years. This is based on its longevity, notably it is a short-lived perennial or facultative annual and has continuous recruitment.

#### Distribution

The taxon is very localised in the southern and western Otway Ranges, further west toward Warrnambool, and at the catchment of Sealers Cove in Wilsons Promontory (VicFlora 2018).

#### Habitat

The taxon occurs as a highly shade-tolerant annual or short-lived perennial in the understorey of wet forests and riparian environments. Substrates include soils derived from Cretaceous sandstone/mudstone (Otway Ranges), alluvium in *Leptospermum lanigerum* Swamp Scrub derived from Recent Volcanics, and coarse textured loam

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derived from granite (Wilson's Promontory). Where the taxon is a facultative annual, it grows (with *A. pusilla* subsp. *muelleri*) on shallow soil over large rocks.

### Threats

Threats to the taxon include climate change, including decreased rainfall, increased evaporation, extreme temperatures, and extreme rainfall events, for example, 1 in 100 year flooding causing flash floods, soil erosion and/or severe scouring of riparian environments. The taxon is also threatened by increased frequency and intensity of fires, weed invasion, pugging of Swamp Scrub by cattle, and deer grazing (especially Hog Deer).

### 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:

#### Eligible under Criterion A3 as Vulnerable

The population reduction over the next 6 to 15 years is suspected to be 30%, based on (c) above.

Future decline is based on the projected impacts of the identified threats.

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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 B2 as Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 9124 km<sup>2</sup>, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented. Widely scattered populations occur over a distance of c. 315 km east to west in southern Victoria. At the western end of its distribution, very extensive clearing for agriculture has occurred to Swamp Scrub habitat.

It is inferred 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.

#### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 52 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 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:

#### Ineligible under Criterion C as Data Deficient

No reliable estimate of the total population size for the taxon 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 <sup>2</sup> 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

Carr, G. W. (2012). Inventory of indigenous and exotic plant species occurring in Woolly Tea-tree (*Leptospermum lanigerum*) Swamp Scrub (Ecological Vegetation Class 53) west of Melbourne, Victoria: 2012. Fairfield: Ecology Australia.

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[https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)

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McMahon, A.R.G. (1987). The effects of the 1982-83 bushfires on sites of significance: Environmental Studies Publication Series No. 411. Conservation Forest and Lands.

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