

## *Synaptantha tillaeacea* var. *tillaeacea* Native Madder

### Taxonomy

*Synaptantha tillaeacea* var. *tillaeacea* (F. Muell.) Hook. f.

### Current conservation status

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

### Proposed conservation status

Critically Endangered in Victoria

Criteria B1ac(iv)+2ac(iv)

### Species Information

#### Description and Life History

The taxon is a spreading, prostrate, somewhat succulent annual to c. 20 cm diam. Leaves narrow-elliptic, 2-5 mm long (including pseudopetiole c. 1 mm), 0.7-1.5 mm wide, apex subacute; stipular sheath 0.5-1 mm long, pale, 2-6-toothed or narrowly lobed on each side. Flowers 1 or 2 per axil; pedicels 1-2 mm long at anthesis, elongating to c. 4 mm in fruit; hypanthium c. 0.5 mm long at anthesis, cupular, slightly compressed, wider than long; sepals erect, narrow-triangular, about as long as hypanthium; petals triangular, slightly exceeding sepals, pale, membranous; stamens subequal to sepals; style c. 0.2 mm long. Capsule cupular, c. 1 mm long, 2 mm wide, slightly flattened; seeds elliptic, irregularly trigonous, c. 0.5 mm long, blackish, shining, alveolate, 20-40 per capsule (VicFlora 2018).

#### Generation Length

The generation length of *Synaptantha tillaeacea* var. *tillaeacea* is inferred to be 1 to 10 years. Recruitment of the taxon is from a long-persistent, soil-stored seedbank. Although it is an annual herb, recruitment is not necessarily at regular annual intervals. Recruitment is triggered by rainfall events and floods, or other episodic events, of highly variable intensity or frequency. Good rainfall events occur on average every 8-10 years in the mallee.

#### Distribution

The taxon is known in Victoria from only two recent collections (1999, 2011) from the Murray River floodplain downstream of Robinvale at Gadsen Bend, and Ned's Corner Station.

#### Habitat

At Robinvale the taxon occurs in chenopod shrubland and *Eucalyptus largiflorens* (Black Box) grassy woodland, and at Ned's Corner Station it occurs in shallow depressions in chenopod shrubland.

At Ned's Corner it is associated with *Alternanthera* sp. 1, *Atriplex nummularia* subsp. *omissa* (Dwarf Old-man Saltbush), *Atriplex vesicaria* (Bladder Saltbush), *Bergia trimeria* (Small Water-Fire), *Centipeda crateriformis* (Lagoon Sneezeweed), *Eragrostis dielsii* (Mallee Love-Grass) (prostrate), *Euphorbia drummondii* (Flat Spurge), *Herniaria cinerea* (Hairy Rupture-Wort), *Lysimachia arvensis* (Pimpernel), *Maireana pyramidata* (Sago Bush), *Phyllanthus lacunellus* (Sandhill Spurge), *Schenkia australis* (Spiked Centaury), and *Stemodia florulenta* (Blue Rod) (Stajcs pers. observ. 2011).

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## Native Madder

At Gadsen Bend the plants grow in riparian *Eucalyptus camaldulensis* (River Red-gum) and *E. largiflorens* (Black Box) woodland/grassland, on shallow light grey sand overlying grey sandy clay. The taxon is associated with *Rhagodia spinescens* (Hedge Saltbush), *Enchylaena tomentosa* (Ruby Saltbush), *Austrostipa nitida* (Balcarra Spear-Grass), *Eragrostis lacunaria* (Purple Love-Grass), *E. dielsii* (Mallee Love-Grass), and *Pseudoraphis spinescens* (Spiny Mud-Grass). This site is on shifting alluvium, an ephemeral habitat and population (IUCN assessment by DELWP 2006).

In western New South Wales, the taxon has a scattered distribution and is seldom abundant. "It grows in a variety of communities including those dominated by buck spinifex, red box, gidgee, mulga and belah, on soils varying from sandy red earths to heavy clays" (Cunningham *et al.* 1981).

### Threats

The main threats to the taxon are climatic drying and decreased rainfall as a result of climate change, and possibly weed invasion. The taxon is an annual herb, and recruitment is presumably dependent on favourable moisture, rainfall, or flooding. Climatic drying and a decrease in rainfall will likely result in fewer favourable seasons and more frequent recruitment failure.

Both subpopulations are very small, making them highly susceptible to stochastic events which can lead to a major decline or local extinction within a very short time frame.

### 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;">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>			

### 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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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 B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km<sup>2</sup>, 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 naturally at the landscape scale. It has no specialised mechanism for long-distance dispersal and has a patchy distribution with most occurrences isolated from other occurrences at separations exceeding its potential dispersal range.

The taxon is estimated to have extreme fluctuations in (iv) above under pre-settlement conditions.

### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As noted above, the taxon is severely fragmented, and has extreme fluctuations in (iv) 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

It is estimated that there are 100 to 500 mature individuals, but other thresholds under this criterion have not been met.

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 D as Endangered

It is estimated that there are 100 to 500 mature individuals. At the Ned's Corner Station only 10 plants were found in 2011 over an eleven day general botanical survey of the property (V. Stajsic pers. observ. 2011). The only population information for the Gadsen Bend population are the notes on the National Herbarium of Victoria (MEL) specimen label stating it is 'uncommon.'



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

## References

Cunningham, G.M., Mulham, W.E., Milthorpe, P.L. and Leigh, J.H. (1981). *Plants of western New South Wales*. Soil Conservation Service of N.S.W.

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

PlantNet (1992). New South Wales Flora online, Royal Botanic Garden Sydney: *Synaptantha tillaeacea* (F.Muell.) Hook.f. Retrieved from: <http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Synaptantha~tillaeacea>.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Synaptantha tillaeacea* var. *tillaeacea*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/331d412c-91f1-4866-b666-117462d6ecd7>.