

## *Glossocardia bidens* Cobbler's Tack

### Taxonomy

*Glossocardia bidens* (Retz.) Veldkamp

### 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

Criterion B1ab(iii)c(iv)

### Species Information

#### Description and Life History

The taxon is few-branched, often almost leafless, c. glabrous perennial to c. 50 cm high. Basal leaves lanceolate to triangular in outline, 1-8 cm long, 0.5-3 cm wide, pinnatisect with narrow acute entire to pinnatifid lobes, green above, glaucous below; petiole 1-5 cm long; cauline leaves few, smaller, simple to pinnatifid, subsessile. Capitula 5-8 mm diam.; involucre bracts 2-seriate, c. equal, narrow-lanceolate, 3-4 mm long; receptacle scales slightly longer and narrower than inner involucre bracts. Ray florets 5-12; ligules 2-4 mm long, yellow; disc florets 7-12, bisexual, 4-lobed, yellow; anthers black. Cypselas linear-lanceolate, 5-8 mm long, compressed, ribbed, glabrous, dark brown; pappus of 2 straight diverging retrorsely barbed awns 1-3(-5) mm long. The taxon flowers mostly summer and autumn (VicFlora 2018).

#### Generation Length

The generation length of *Glossocardia bidens* is estimated to be 2 to 10 years. This is based on the taxon's habit of a tufted perennial herb to 50 cm high.

Cunningham et al. (1981) noted that the taxon is a "perennial forb with strong taproot, common only in years of high summer rainfall, when it can be abundant across reasonably large areas, but disappears again with onset of drought or after several years high winter rainfall. The plants die back when moisture is limited, to reshoot from the base after warm season rainfall." Recruitment is presumably from long-persistent soil-stored seed banks.

#### Distribution

In Victoria, the taxon is known from 2 sites, and is apparently confined to the Ingeegoodbee and Suggan Buggan Rivers in East Gippsland. It also occurs in Western Australia, Northern Territory, South Australia, Queensland, New South Wales, the Pacific islands, and east Asia (VicFlora 2018).

The taxon is known from three collections held at MEL (1939, 1969, 1980). The collections from 1969 and 1980 are likely from the same site (Neville Walsh pers. comm. May 2019).

#### Habitat

In Victoria the taxon is uncommon to rare, apparently confined to the valleys of the Ingeegoodbee and Suggan Buggan Rivers in East Gippsland, where it occurs in open sites in dryish woodland. Only one of the three Victorian collections (1980 collection) provides any habitat information. In NSW, the taxon occurs in a wide range of habitats.

## Threats

The Victorian sites grow in the rainshadow region of East Gippsland. Increased drying as a result of climate change is likely to result in a decrease in favourable rainfall events, which is needed for recruitment. Prolonged drought is likely to eventually kill plants that die down to rootstock during drought.

Potential future weed invasion might also pose a threat, particularly invasion by taxa in the *Rubus fruticosus* aggregate. It is unknown what effect, if any, native and introduced herbivores have or might have in the future.

## 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

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.

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).

It is inferred to have 1 location, as all key identified threats apply across its range and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (iii) above based on the impacts of the identified threats, notably climatic drying and warming, decreased rainfall, and weed invasion.

It is inferred to have extreme fluctuations in (iv) above, as it is presumed to have been subject to extreme fluctuation in population size under pre-settlement conditions.

#### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AOO) across the taxon's range is estimated to be 12 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has 1 location, has a continuing decline in (iii) and extreme fluctuations in (iv) above.

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 estimated that there are 50 to 300 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 50 to 300 mature individuals.

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*. New South Wales Government Printing Office: Sydney



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

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Glossocardia bidens*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/61bc728c-3be0-40fc-aa59-fbf920de3d52>