Threatened Species Assessment

Cassinia tegulata
Avenue Cassinia

Taxonomy

Cassinia tegulata Orchard

The taxonomy of *C. tegulata* is stable and is a recently described taxon. It was previously included under *C. uncata.*

Current conservation status

Listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2016).

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A2ce; B1ab(i,iii,iv,v)+2ab(i,iii,iv,v); C2a(ii)

Species Information

Description and Life History

The taxon is an erect shrub 0.5-1.6 m high; branchlets lanate when young becoming glabrous with age, no resinous exudate. Leaves erect to semierect, sessile, narrowly linear to terete, (10-)15-35(-40) mm long, 1-1.5 mm wide, sparsely pilose with loose cottony hairs above, glabrous or with cottony hairs beneath, apex rounded and recurved with a short reflexed mucro, margins revolute to the midrib. Inflorescences corymbose or hemispherical, 2-7 cm diam. Capitula 100-150(-300), white, obconical, 4.5-5.3(-6.0) mm long, 2-2.5 mm wide. Involucral bracts c. 25, 5-ranked, innermost with lamina deltoid, 1.2-2 mm long, white; lamina margin entire, flat or slightly incurved. Receptacle bracts 1-3. Florets 4 or 5. Cypsela columnar or narrowly obconical, (1.0-)1.3 mm long, glabrous; pappus 2.0-2.5 mm long. Flowers February-April (VicFlora 2018).

Generation Length

The generation length of *Cassinia tegulata* is estimated to be 10 to 30 years (midpoint 20 years). This is plausibly based on the frequency of local flood events, or on past drought, rainfall events, or fire notionally in the 20-30 year range.

Distribution

In Victoria the taxon is known only from a single population in remnant roadside vegetation and adjacent private land near Edenhope. It is also found in South Australia (VicFlora 2018).

Habitat

In Victoria, the taxon is found growing in disturbed remnant roadside in *Eucalyptus camaldulensis* woodland. Associated taxa include *Melaleuca brevifolia* (dominant), *Haloragis myriocarpa, Pimelea glauca,* and *Phalaris aquatica.* In South Australia it is found in open to dense shrubland, in slightly wetter interdune areas in grey or yellowish sand over clay (Orchard 2004).

Threats

Human intrusions and disturbance are likely to have a high impact on the taxon, along with invasive and other problematic taxa/genes. Droughts as result of climate change are also expected to impact the taxon.

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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(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 30 to 90 years is inferred to be 80%, based on (c) and (e) above.

Past reduction is inferred from past land clearing, habitat degradation and fragmentation. The taxon may have never been common in the area, and it is possibly at the edge of its range.

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

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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 4 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is estimated to have one 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 (i), (iii), (iv) and (v) above as a result of inappropriate roadside management and weed invasion.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has 1 location, and has a continuing decline in (i), (iii), (iv) and (v) 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:

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 10 to 150 (midpoint 100) mature individuals. It is known from a single site in Victoria, and when it was first collected from the site in 2009 there were estimated to be more than 20 plants. It was re-collected in 2010 by V. Stajsic and while the area was not surveyed, there was an opportunistic count of seven plants. A recent inspection of the site by Iestyn Hosking found at least 100 or more mature plants.

The number of mature individuals is inferred to continue to decline due to the potential impacts of future road works, altering of hydrology, and weed invasion, and the percentage of mature individuals in one subpopulation is 90-100 %.

Criterion D. Very small or restricted population			
	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 km2 or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Endangered

It is estimated that there are 10 to 150 (midpoint 100) mature individuals.

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

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

Orchard, A.E. (2004). A revision of *Cassinia*. 2. Sections Complanatae and Venustae. *Australian Systematic Botany* 17(6)505-533.

SAC (2016). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 866 *Cassinia tegulata*.

TSSC (2008). Threatened Species Scientific Committee Conservation Advice *Cassinia tegulata* (Avenue Cassinia). Canberra: Department of the Environment and Energy. Retrieved from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/81640-conservation-advice.pdf

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