Threatened Species Assessment

Callistemon wimmerensis
Wimmera Bottlebrush

Taxonomy

Callistemon wimmerensis Marriott & G.W. Carr

This taxon was placed in the genus *Melaleuca* by Craven (2006). DNA (Miller *et al* 2011) has shown that in at least one population hybridisation is apparent.

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 2010).

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

Proposed conservation status

Endangered in Australia

Criteria A2ce+3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

C. wimmerensis is an erect shrub or small tree to c. 10 m high; bark hard, slightly fissured; branches ± stiff, ascending. Leaves moderately to densely arranged, narrowly oblanceolate to narrowly elliptic, (1.2-)3-5(-6) cm long, (2-)4-7(-8) mm wide, mucronate, midrib and marginal veins prominent, lateral veins obscure, oil glands visible on lower surface. Flower spikes mostly 3.5-5 cm long, 3.2-3.5 cm wide with a hairy axis; hypanthium 2-3.3 mm long, glabrous except for a ring of hairs on the rim; stamens 11.5-13.5 mm long, filaments pink, anthers yellow. Capsules 3.5-5 mm long, 4-8 mm wide. Flowers October-December (VicFlora 2016).

The taxon is a long-lived riparian or rheophytic shrub that only reproduces by seed. It is assumed to be a post-fire resprouter as with other *Callistemon,* and because it suckers from rootstock when damaged. It is monoecious, its flowers are bisexual, and it is probably predominantly outcrossing but expected to be self-fertile. Pollination is by honeyeaters and possibly exotic honeybees, and gene-flow is via honeyeaters to several hundreds of metres. Recruitment is continuous with low-level trickle of seed from woody capsules, but with massive post-fire seed release from capsules on the death of the canopy. The capsules generally retain seeds for a decade or more and are wind and water dispersed. It is probably not, or very little, browsed by native mammals and livestock such as cattle.

Generation Length

The generation length of *Callistemon wimmerensis* is suspected to be 80 to 100 years. This is based on the size of the taxon and its response to fire. The largest plants are very old, consistent with the genus in general including cultivated plants.

Distribution

C. wimmerensis occurs in the northern and western Grampians, and mostly along the Mackenzie and Glenelg Rivers.

Habitat

The taxon occurs in riparian eucalypt-dominated woodland on alluvial terraces and banks within the flood zone of permanent and intermittent streams, as well as in shallow freshwater swamps.

Threats

Threats relating to this taxon include soil erosion and siltation of streams, weed invasion, environmental damage by pigs, nectar-robbing by honeybees (Paton 1993), drought resulting in death of mature plants, climate change related threats such as decreased rainfall and increased evaporation, water impoundments such as the Wartook and Rockland Reservoirs, river regulation causing decreased frequency and amplitude of flooding, and altered timing of flooding. Other threats include stock grazing on freehold land, increased frequency and intensity of fire, unnatural timing of fire, hybridisation with wild and cultivated *Callistemon* taxa, and infestations of lethal or sub-lethal populations of the parasitic *Cassytha pubescens*.

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 Endangered

The population reduction over the past 240 to 300 years is suspected to be 50 to 70%, based on (c) and (e) above.

Past decline is based on the severe and very extensive modification of the taxon's habitat for agriculture, and hydrological management including dams, streams, re-alignments, and water extraction that have occurred since settlement. Almost all habitats are moderately to highly degraded.

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

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is suspected to be 30 to 50%, based on (c) and (e) above.

Future significant decline is probable, given the large suite of threats currently operating, particularly climate change and weed invasion.

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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 1,444.5 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to be severely fragmented as there are multiple small isolated subpopulations that are all at risk, such that there is increased extinction risk and little or no probability of recolonisation should subpopulations become extinct.

It is inferred to have 1 location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the impacts of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 24 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is severely fragmented, has 1 location, and has a continuing decline in (i), (ii), (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:

Ineligible under Criterion C

It is suspected that there are 200,000 to 400,000 mature individuals, which exceeds the thresholds for criterion C.

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:

Ineligible under Criterion D

It is suspected that there are 200,000 to 400,000 mature individuals, which exceeds the thresholds for criterion D.

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

References

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