

Threatened Species Assessment

Callistemon brachyandrus Prickly Bottlebrush

Taxonomy

Callistemon brachyandrus Lindl.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A2bce+3bce+4bce; B1ab(i,ii,iii,v)+2ab(i,ii,iii,v); C2a(ii)

Species Information

Description and Life History

Callistemon brachyandrus is a stiff shrub or small tree usually 2-3 m high; bark grey, becoming rough and fissured; branches stiff to flexuous. Leaves terete to narrowly oblanceolate, mostly 2-3 cm long, 0.5-1 mm wide with a pungent mucro, margins inrolled to form a narrow groove or depression on the upper surface, veins and oil glands obscure. Flower spikes open, mostly 3-5 cm long, 2-3 cm wide, generally with leafy bracts towards the tip; axis densely hairy; hypanthium densely hairy; stamens mostly 9-10 mm long, filaments rich crimson, anthers yellow. Capsule 4-5 mm long and wide. Flowers mainly late summer (VicFlora, 1996).

This is a long-lived shrub (> 50 years and likely around 100 years). It germinates and establishes largely following floods in its riparian environment. It blooms by 5-10 years after germination and maintains a long-term elevated seed store, with no soil seed store indicated. It blooms and sets seed most years, excluding notable droughts. It does not vegetatively reproduce (i.e. there is no suckering), although this is derived from field observations and is conjectured, short of excavations (D. Cheal (unpubl. data)).

Generation Length

The generation length of *Callistemon brachyandrus* is estimated to be 50 to 150 (midpoint 100) years. This is based on its germination opportunities occurring immediately after peak floods, and the current management of river floods precluding many floods from reaching the upper limits of former flooding.

Distribution

In Victoria the taxon is restricted to, and immediately adjacent to, riparian areas in Hattah-Kulkyne National Park.

Habitat

C. brachyandrus is restricted to the Murray-Darling river system, and the lower reaches only in semi-arid to arid climates. In Victoria, it is dependent on flooding for germination and establishment, and does not occur throughout the riparian environment. However, it is largely restricted to the upper reaches of the riparian environment which were only flooded by systems-wide floods at the peak of the most intense flooding events. There is often a lens of aeolian sand deposited on the soil surface in these sites. It is not known whether this surface sandy horizon is a critical habitat requirement or largely a result of post-European settlement habitat changes, though it is likely due to the latter. Mature individuals are drought resistant and are well able to survive for many decades between floods.

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Prickly Bottlebrush

Threats

The major threat to the taxon is river management restricting the extent and intensity of flooding events, particularly as stands of *C. brachyandrus* only occur at the highest flood levels that have not been flooded for decades. River regulation is now so effective that floods within Hattah-Kulkyne that floods are now largely contrived i.e. are partial only, and are driven by environmental water allocations. There is no evidence of *C. brachyandrus* expanding its range to the sites that are now at the peak flood levels.

Minor threats include pigs rooting around and uprooting small plants, goats browsing the large shrubs, and rabbits and kangaroos browsing any regenerant seedlings.

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> <ul style="list-style-type: none"> (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 150 to 450 years is estimated to be 60 to 75%, based on (b), (c) and (e) above.

The taxon has suffered major declines as a result of the removal of flooding that is critical for recruitment.

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 estimated to be 65 to 75%, based on (b), (c) and (e) above.

As the taxon occurs at the top of the flooding catena and river regulation prevents floods to the necessary intensity and extent, it is possible (even likely) that all extant stands will be extinguished. There is no evidence (yet) of new stands being established at the top of the current flooding extents.

Callistemon brachyandrus

Prickly Bottlebrush

Eligible under Criterion A4 as Endangered

The population reduction over any 150 to 450 year period, including both past and future (up to 100 years in the future) is estimated to be 65 to 75%, based on (b), (c), and (e) above.

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 ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 178 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to have 3 locations, and has continuing decline in (i), (ii), (iii) and (v) above, based on the prevention of intense flooding which will result in extant stands being extinguished.

The Area of Occupancy (AoO) is estimated to be 38 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, it has 3 locations and has continuing decline in (i), (ii), (iii) and (v) above.

Callistemon brachyandrus

Prickly Bottlebrush

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 Endangered

It is estimated that there are 500 to 1,500 (midpoint 1,000) mature individuals. *C. brachyandrus* is a distinctive taxon and is unlikely to have been overlooked. The National Park is relatively well surveyed, and a small number of reliable field workers have reported on this taxon within Hattah-Kulkyne.

The percentage of mature individuals in each subpopulation is 100%.

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 ² or number of locations ≤ 5

Evidence:

Eligible under criterion D as Vulnerable

It is estimated that there are 500 to 1,500 (midpoint 1,000) individuals, and 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

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Callistemon brachyandrus Prickly Bottlebrush

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