Threatened Species Assessment

Darwinia camptostylis
Clustered Darwinia

Taxonomy

Darwinia camptostylis B.G. Briggs

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criteria D1+2

The taxon is believed to have 100% of its 9 Victorian sites occurring within the footprint of the 2019/20 bushfires. The taxon is considered fire-sensitive and the success of post-fire recruitment is not assured under prevailing threats which may result in recruitment failure.

Species Information

Description and Life History

The taxon is a shrub 10-30 cm high, dense, spreading or erect. Leaves triquetrous, crowded, 6-12 mm long, c. 0.75 mm wide, glabrous, apex acute, mucronate. Flowers in pairs, 2-4 pairs clustered in upper leaf axils; bracteoles yellowish-green, oblong or lanceolate, 3.5-6 mm long, caducous after flowering; hypanthium 3-6 mm long, 1-1.5 mm diam., with rounded ribs, white above the ovary, sometimes red-tipped; sepals triangular, c. 1 mm long, usually entire; petals ovate, c. 2 mm long; style white, 2.5-5 mm long, strongly curved. Flowers mainly August-November (VicFlora 2019).

Generation Length

The generation length of *Darwinia camptostylis* is estimated to be 15 to 50 years. This is based on the life expectancy of various *Darwinia* taxa from eastern Australia being determined to be between 15 and 50 years (DBCA 2018; NSW DEC 2004).

Distribution

In Victoria the taxon is confined to Croajingolong National Park, from near Tamboon Inlet. It is also found in New South Wales.

Habitat

The taxon occurs in windswept coastal heathlands and heathy woodland (VicFlora 2019).

Threats

Increased severity and frequency of fire could kill plants before they mature and deplete soil-stored seedbank, which may be expected in the future with climate change.

The taxon may be susceptible to infection by the pathogen *Phytophthora cinnamomi* which is documented to have spread south-west from the Mallacoota Aerodrome (David Cameron pers. obs. 1973), where some of the largest stands of the taxon occur.

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:

Ineligible under Criterion A

The population reduction for this taxon is below the threshold for eligibility under 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 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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 451 km², and the Area of Occupancy (AoO) across the taxon's range is estimated to be 40 km², but other thresholds under the criterion have not been met.

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 800 to 1,700 mature individuals, but other thresholds under this criterion have not been met.

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 Vulnerable

It is estimated that there are 800 to 1,700 mature individuals.

D. camptostylis tends to be locally common at sites where it occurs. The assessor visited a site northeast of Lake Wau Wauka where around 100-200 plants occurred. It is expected that this number represents an average size of a subpopulation of the taxon as other subpopulations are also described as locally abundant, common or frequent that could match this number. The Seal Creek subpopulation was estimated to have several hundred plants. This is here assumed to be between 300 and 500 plants. Adding this to the remaining subpopulations (5-6) which are assumed to have between 100 and 200 plants gives an estimate of 800 to 1700 plants.

The taxon is estimated to be very restricted. The taxon has a restricted distribution, occurring in 2 locations, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations. This is in response to the impact of the identified long-term threats, notably increased severity and frequency of fire.

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

References

Benson, D. and McDougall, L. (1998). Ecology of Sydney plant species: Part 6 Dicotyledon family Myrtaceae. *Cunninghamia* 5: 809-987.

DBCA (2018). *Mason's Darwinia (Darwinia masonii) Recovery Plan.* Wildlife Management Program No. 66. Department of Biodiversity, Conservation and Attractions, Western Australia.

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NSW DEC (2004). Recovery Plan – *Darwinia biflora*. NSW Department of Environment and Conservation, Hurtsville. Retrieved from: https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Recovery-plans/darwinia-biflora-cheel-briggs-recovery-plan.pdf

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Darwinia camptostylis* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/aa41df32-44ba-458f-9a9f-dd6a057b0509