



Cyathea cunninghamii Slender Tree-fern

Taxonomy

Cyathea cunninghamii Hook. f.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1992).

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

Proposed conservation status

Critically Endangered in Victoria

Criterion A2ac

Species Information

Description and Life History

The Slender Tree-fern is a tall treefern in the Cyatheaceae family. It has a slender trunk and small crown. Recruitment is from spore, with plants reaching maturity at an age of about 25 to 30 years. Spores readily spread, but the adult plants only grow in long-undisturbed, deep sheltered gullies with high mean annual rainfall and significant summer rainfall. They are very sensitive to bushfires, both directly and indirectly, by exposing the surviving plants to an altered (and less favourable) microclimate. It may be recognised in the field from other *Cyathea* species by frond butt (stipe) and scale characters, maturation heights and habitat.

Generation Length

The generation length of *Cyathea cunninghamii* is inferred to be 25 to 100 (midpoint 30) years. The upper limit is conjectural and is probably determined by architecture, as this is a very thin-stemmed taxon that extends well above the protective lower strata.

Distribution

The taxon is scattered in the highest rainfall parts of the state, throughout the Ranges, from the Otways to the NSW border.

Habitat

The taxon occurs in deep, undisturbed (including long unburnt) gullies in high-rainfall cool temperate rainforest and fern gullies, and only in deep, friable, gradational and relatively organic (somewhat peaty) soils .

Threats

The main threats are bushfires and planned burns (these two by far the most significant threats), including mechanical damage as a result of fire suppression and management works. Fires open the habitat thus permitting drying winds to enter and overgrowth by ephemerals and short-lived shrubs and herbs impedes subsequent occupation by *C. cunninghamii*. The taxon is also threatened by deer disturbance (direct browsing, antler rubbing and use of wallows) and by climate change. Plants are not collected for horticulture but are sparingly present in horticulture from nursery-propagated specimens.

Cyathea cunninghamii

Slender Tree-fern

The 2019-20 bushfires are believed to have potentially impacted up to 20% of the taxon's habitat. The taxon is sensitive to fire and is likely to have been significantly impacted, although the degree of damage is yet to be determined.

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>
--	---------------------------------------	---

Evidence:

Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 75 to 300 years is inferred to be 50 to 85%, based on (a), (c) and (e) above.

This is based on the loss of known populations as a result of historic timber harvesting within the habitat and unsuitable fire regimes.

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 75 to 100 years is projected to be 60 to 75%, based on (c) above.

This is the expected trajectory under climate change (derived from modelling), and the ongoing impacts of the identified threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 75 to 300 year period, up to 100 years into the future, is projected to be 50 to 75%, based on (a), (c) and (e) above.

Cyathea cunninghamii

Slender Tree-fern

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 Vulnerable

The Area of Occupancy (AoO) is estimated to be 532 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Any two of (a), (b) or (c) above are also satisfied.

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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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				

Cyathea cunninghamii

Slender Tree-fern

Evidence:

Eligible under Criterion C as Endangered

It is estimated that there are 300 to 3,000 (midpoint 2,000) mature individuals. Populations are never large. It is always the least common of local tree ferns, even in prime habitat.

There is projected to be a continuing decline of 20 to 75% within one generation.

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 km ² or number of locations ≤ 5 [Ⓜ]

Evidence:

Ineligible under Criterion D

It is estimated that there are 300 to 3,000 (midpoint 2,000) 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.

SAC (1992). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 191 *Cyathea cunninghamii*