Threatened Species Assessment

Eucryphia moorei
Eastern Leatherwood

Taxonomy

Eucryphia moorei F. Muell.

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

A2bce+3ce+4bce; B1ab(i,ii,iii,iv); C1

Species Information

Description and Life History

The taxon is a tree or shrub to 12 m high, often with several stems arising from epicormic shoots at base of main bole. Branchlets brown- to white-tomentose. Leaves pinnate; leaflets usually 5–13 but reduced to c. 3 on flowering branches, oblong to oblanceolate, 1–6 cm long, 0.5–2 cm wide, apex acute to retuse with a short mucro, lamina leathery, occasionally resinous, dark green, nearly glabrous above, white-tomentose below; petiole 0.5–1.5 cm long; stipules resinous, 5–10 mm long. Flowers 1–5 in upper axils; bracts brown, ovate, c. 5–7 mm long, persistent till flower senescence; sepals 5–8 mm long; petals white, 8–15 mm long; stamens numerous, in series, 5–10 mm long; ovary white, silky tomentose. Fruit an ovoid capsule, locules boat-shaped, 6–15 mm long. The taxon flowers January–April (VicFlora 2018).

Generation Length

The generation length of *Eucryphia moorei* is estimated to be 100 to 250 years. Large emergent *E. cordifolia* from Chile with a diameter at breast height (DBH) of greater than 1 metre have been estimated to be able to live for at least 400 years (Tejo et al. 2009). *E. moorei,* which can attain similar size and occurs in a similar climate, is expected to live to a similar age. Many Victorian trees are not emergent with a DBH greater than 1m, and so it is estimated that the most trees are around 100 to 250 years old in Victoria.

Distribution

In Victoria the taxon is confined to gullies and creek flats east of Mallacoota Inlet.

Habitat

The taxon is restricted to Warm Temperate Rainforest (WTRF).

Threats

E. moorei is a rainforest taxa, and as such is reliant on constant moisture and a complete absence of fire. As a result the major threats are reduction in moisture availability as a result of a decrease in annual rainfall, and increased fire severity and frequency in adjacent sclerophyll vegetation, as a result of increased dryness and extremes of temperature that may be expected to become more common as a result of climate change. Introduced Sambar Deer (*Rusa unicolor*) are also a threat, causing damage through rubbing on trees and herbivory which is problematic for coppice growth and saplings.

The taxon is believed to have about 60% of its 18 Victorian sites occurring within the footprints of the 2019/20 bushfires, and part of its habitat may have been burnt at high severity. It is believed to be fire sensitive in the context of these fires and is considered to be at some risk of post-fire impacts

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

Population reduction over the last 300 to 750 years is estimated to be 50 to 80%, based on (b), (c) and (e) above.

The number of mature individuals is likely to have decreased since European settlement due to fire, drought, and loss of habitat. WTRF is demonstrably declining in Victoria (DSE 2009).

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

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 100 years is projected to be 60 to 95%, based on (c) and (e) above.

Threats such as severe drought and increased fire severity and intensity may be expected in the future, and may cause a decline in the number of mature individuals.

Eligible under Criterion A4 as Critically Endangered

Population reduction over any 200 to 750 year period, including both past and future (up to 100 years in the future), is estimated to be 60 to 95%, based on (b), (c) and (e) above. The causes of 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 42 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

It is estimated to have 1 location, as all subpopulations are in neighbouring creek lines in the same habitat east of Mallacoota Inlet. It has a continuing decline in (i), (ii), (iii) and (iv) above, based on the impact of the identified threats, including browsing by Sambar Deer, drought, and potential fire.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 42 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), (ii), (iii) and (iv) 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 C1 as Critically Endangered

It is estimated that there are 85 to 250 mature individuals. This is based on reports from collectors of some subpopulations having between 1 and 20 trees present at a site. Subpopulations are usually composed of sparsely distributed individuals rather than being densely populated, the exception to this is on the east side of Howe Hill where the taxon is the dominant canopy taxa for a large tract of rainforest. Based on the taxon being represented by a tree every 50 metres in this rainforest, this subpopulation consists of 40 to 50 trees. All other subpopulations are estimated to consist of 5 to 20 trees. Given there is 9 to 10 subpopulations, the number of mature individuals is likely to be in the range given.

There is estimated to be a continuing decline of 60 to 95% 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 km2 or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Endangered

It is estimated that there are 85 to 250 mature individuals.

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

References

DELWP (2020). *Victoria's bushfire emergency: biodiversity response and recovery.* Preliminary report - Version 2. Department of Environment, Land, Water and Planning. East Melbourne

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne.

DSE (2009). Action Statement – Rainforests and Myrtle Wilt (No. 238). Department of Sustainability and Environment. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0016/32452/Human-activity.pdf

Tejo, C.F. et al. (2009). *Epiphytic soils of the canopy emergent Eucryphia cordifolia (Cunoniaceae) in a coastal rainforest of Chiloé Island, Chile*. 94th ESA Annual Meeting, Albuquerque Convention Centre.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Eucryphia cordifolia*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/5d5d53e2-74f8-4bb2-8534-024b39f02b15