

Eupomatia laurina Bolwarra

Taxonomy

Eupomatia laurina R. Br.

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 A2ce+3ce+4ce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a tall, many-stemmed or small rather bushy tree to c. 6(-9) m high. Branchlets often drooping, brown or black. Leaves bright green, glossy on the upper surface, sometimes with a coppery tinge (particularly on new growth), elliptic to obovate 5-15.5 cm long, 2-5.8 cm wide; petiole c. 6 mm long. Flowers white to cream, 2-2.5 cm diam., strongly perfumed. Fruit mostly urn-shaped, 1.5-2 cm diameter. The taxon flowers from December to February. Pollination is by beetles. Pulp of the ripe fruit is edible (VicFlora, 2017). The taxon can attain a height of about 15 m and a stem diameter of 30 cm.

Generation Length

The generation length of *Eupomatia laurina* is estimated to be 50 to 200 years. This is based on a plausible longevity of 100-200 years or more, and an inference from field observations that the taxon is a fire-sensitive facultative resprouter which recruits more or less continuously in the absence of fire, with a possible additional pulse following fire events in the surrounding forest.

The taxon is observed to resprout after low to moderate intensity fire, allowing established individuals to persist as multi-stemmed crowns.

Distribution

The taxon is restricted in Victoria to East Gippsland eastwards from about Nowa Nowa. A single record from Dandenong in 1901 is likely to be of cultivated origin. The taxon also occurs in New South Wales, Queensland, and New Guinea (VicFlora, 2017).

Habitat

The taxon has moderately high fidelity to Warm Temperate Rainforest, with most documented occurrences in mature, well-developed rainforest stands in the lowlands and foothills, from sea level to an elevation of 360 m. The taxon extends into adjacent stands of Riparian Forest or, occasionally, into ecotonal stands of Damp Forest, Lowland Forest or Wet Forest.

The most commonly associated canopy trees are *Syzygium smithii*, *Acronychia oblongifolia*, *Elaeocarpus reticulatus*, *Myrsine howittiana*, *Pittosporum undulatum* and *Tristaniopsis laurina* with the most commonly associated emergents *Acacia melanoxylon*, *Eucalyptus cypellocarpa* and *E. muelleriana*. The most abundant

associated climber is *Cissus hypoglauca*. In mature rainforest stands, the taxon is frequently recorded with projective foliage cover of 5-25% at the quadrat scale.

Threats

Historic decline through habitat loss to agriculture is unlikely to exceed 30% with the greatest losses on the lower Snowy and Brodribb flats near Orbost, in the Cann Valley and on the lower Genoa and Wallagaraugh Rivers near Genoa. The taxon is also likely to have been significantly depleted as a consequence of the documented contraction and elimination of Warm Temperate Rainforest stands across its range, in response to catastrophic bushfires and, to a much lesser extent, other management practices including regeneration burns and fuel reduction burning. Altered fire regimes under climate change are likely continue to threatened this taxon and its habitat.

The taxon is at increasing risk of targeted browsing by Sambar Deer (*Rusa unicolor*), which are currently undergoing a significant expansion in population density and penetration throughout the East Gippsland region.

In the longer term, the taxon is at increasing risk of adult mortality and recruitment failure in response to repeat fire events, extreme drought stress and targeted browsing of juveniles and resprouts by Sambar.

Spatial analysis of likely habitat on all land tenures for *E. laurina* indicates that 59% occurs within the CAR reserve system, including parks and reserves and special protection zones. Further areas are excluded from harvesting by prescription under the Victorian Code of Practice for Timber Production 2014 (the Code). No species-specific protections for the taxon are included in the Code however other more general prescriptions such as protection and buffering of rainforests and waterways provide protection from forestry operations.

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>
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Evidence:

Eligible under Criterion A2 as Endangered

The population reduction over the past 150 to 600 years is estimated to be 50 to 75%, based on (c) and (e) above.

Past decline is based on historic habitat loss to agriculture in river valleys and floodplains including the lower Snowy, Brodribb, Genoa and Wallagaraugh Rivers and in the Cann Valley and depletion of stands in rainforests as a result of high frequency and intensity fire.

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is projected to be 50 to 70%, based on (c) and (e) above.

Future decline is based on the projected impact of altered fire regimes, drought stress and pest animals.

Eligible under Criterion A4 as Endangered

The population reduction over any 150 to 600 year period, including both past and future (up to 100 years in the future), is estimated to be 50 to 75%, based on (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 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 B1 as Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 5600 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the landscape scale with all known occurrences geographically isolated at spacings likely to exceed the effective dispersal range of the taxon. Although the taxon is likely to be dispersed by biotic vectors including frugivorous birds and flying foxes, successful recruitment to replace local extinction is now likely to be compromised by increasing risk of juvenile mortality through drought stress, repeat fire events and, potentially, targeted browsing by Sambar throughout the Victorian range of the taxon. In addition, flowering and fruit production are highly infrequent events, with the vast majority of mature individuals observed without flowers or fruits for extended periods.

A single location is identified since the entire Victorian range of the taxon is subject to the same key threats of repeat fire, contraction and elimination of Warm Temperate Rainforest habitat, recruitment failure due to extreme drought stress and targeted browsing by Sambar.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified current and future threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 160 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it 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 as Data Deficient

There is no available estimate of current population size for Victoria.

Criterion D. Very small or restricted population ^a		Critically Endangered ^a	Endangered ^a	Vulnerable ^a
Number of mature individuals (observed or estimated) ^a		< 50 ^a	< 250 ^a	< 1,000 ^a
D2. Only applies to the VU category ^f 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. ^a		- ^a	- ^a	D2. Typically: ^f AoO < 20 km ² or number of locations ≤ 5 ^a

Evidence:

Eligible under criterion D2 as Vulnerable

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

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne. Retrieved from:
https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

VicFlora (2017) Flora of Victoria, Royal Botanic Gardens Victoria: *Eupomatia laurina*. Retrieved from:
<https://vicflora.rbg.vic.gov.au/flora/taxon/1d9f0e81-9cbd-4079-8b2b-d14b4e215813>