Threatened Species Assessment

Eucalyptus polybractea
Blue Mallee

Taxonomy

Eucalyptus polybractea R.T. Baker

The blueish leaves contrast with those of co-occurring *E. viridis* (VicFlora 2018).

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 A4c; B2ab(ii,iv)

Species Information

Description and Life History

The taxon is a mallee to 8 m tall; bark rough, grey on lower part of stems. Juvenile leaves petiolate, opposite for few pairs then alternate, linear then narrowly lanceolate, to 10 cm long, 1.5 cm wide, dull, grey to blue-green; adult leaves petiolate, alternate, narrowly lanceolate, 6-10 cm long, 0.5-1.5 cm wide, concolorous, dull, grey to bluish-green; side veins very acute; reticulation sparse or obscured by numerous, large, irregular, island oil glands. Inflorescences axillary, unbranched; peduncles to 1.2 cm long, 7-11-flowered; buds glaucous, pedicellate, clavate or diamond-shaped, to 0.7 cm long, 0.4 cm diam., no scar; operculum conical; stamens irregularly flexed; anthers adnate, globoid; ovules in 4 vertical rows; flowers white. Fruit pedicellate, cupular, to 0.6 cm long, 0.5 cm diam.; disc descending; valves 3 or 4(5), below rim; seed brown, irregularly ovoid and slightly flattened, surface shallowly reticulate, hilum ventral. The taxon flowers from autumn to winter (VicFlora 2018).

There are two subspecies located within Victoria (VicFlora 2018).

Generation Length

The generation length of *Eucalyptus polybractea* is estimated to be 150 to 250 years. This is based on a plausible longevity of 300 years or more. It is also based on the ability of the taxon to resprout from the lignotuber and larger stems, thereby extending the life of the individual beyond the pre-settlement fire interval estimated at 45-90 years or more.

Like most Eucalypts in fire-prone dryland habitats, the taxon recruits episodically from an elevated or soil-stored seedbank following intense bushfire events, with only a proportion of adults killed by fire and a majority resprouting successfully following each successive fire event. In addition, there may be a low level of opportunistic (trickle) recruitment in response to outstanding seasonal conditions or localised site disturbance events.

Distribution

The taxon is restricted in Victoria to the area bounded by Avoca, Wedderburn, Bendigo, and Elmore (VicFlora 2018).

Habitat

The taxon occurs on better soils on flats, and near drainage areas in poor rocky country (VicFlora 2018).

Threats

The taxon is the principal mallee taxa used for *Eucalyptus* oil production in central-northern Victoria and at West Wyalong in New South Wales (VicFlora 2018).

The taxon has suffered significant historic decline through habitat loss to agriculture. Current and future threats include incremental habitat loss, particularly for small isolated stands on roadsides and freehold land within highly fragmented rural landscapes, and an increasing long-term risk of adult mortality and recruitment failure in response to extreme drought stress. Climatic drying is not necessarily a threat compared with Box-Ironbark forests in similar habitats within the same landscape settings, which are projected to decline through water stress and recruitment failure. Oil production is not confidently resulting in a significant change in population density and may possibly even enhance recruitment, since seedling establishment is readily observed in the field.

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 Vulnerable

The population reduction over the last 450 to 750 years is estimated to be 30 to 45%, based on (c) above.

Past decline is based on habitat loss to agriculture.

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

Eligible under Criterion A4 as Endangered

The population reduction over any 450 to 750 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 55%, based on (c) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline is based on habitat loss to agriculture. Future decline in the next 100 years is unlikely to exceed 10%, noting that there is now significant replanting for oil production and for carbon sequestration.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 18,128 km^2, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented anthropogenically at the landscape scale. All geographically isolated occurrences occur at separations exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. The only consistent dispersal mechanism is myrmecochory or seed dispersal by ants which operates at the metre scale only.

It is estimated to have 2 locations, and has a continuing decline in (ii) and (iv) above, based on the high risk of local extinction of at least some small and isolated occurrences in highly fragmented rural landscapes, due to the impact of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 376 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is severely fragmented, has 2 locations, and has a continuing decline in (ii) 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:

Ineligible under Criterion C as Data Deficient

There is no available estimate of population size.

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 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.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria*: Eucalyptus polybractea.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/eb244940-5337-4058-82ad-afe3fb82a3a6