Threatened Species Assessment

Eucalyptus tricarpa subsp. *decora*
Bealiba Ironbark

Taxonomy

Eucalyptus tricarpa subsp. *decora* Rule

Strongly pruinose plants from the St. Arnaud district are included in *E. tricarpa* subsp. *decora*. There are several other localised forms in Victoria that might warrant taxonomic recognition. According to VicFlora (2018a) strongly pruinose plants from Maffra in eastern Victoria have tentatively been referred to *E. tricarpa* subsp.*decora,* however these plants have much broader juvenile leaves and larger fruits and probably represent a new taxon.

According to Rule (2004), the populations of three-flowered ironbark with waxy features are distinctive from the typical form of *E. tricarpa* which is non-pruinose and has green, lanceolate to ovate juvenile leaves and green or blue-green adult leaves. The precedent of giving pruinose, grey-leaved forms the rank of species has been set by the erection of *E. nortonii.* In the case of this new taxon, although it occurs in pure populations and is distinctive by its heavy pruinosity and relatively narrow juvenile leaves, it is here considered best recognised as a subspecies as it shows no other substantial morphological divergence.

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criterion A2abcde+3bcde+4abcde; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a tree to 35 m tall; bark rough over whole trunk and branches, thick, hard, furrowed, black (ironbark). Juvenile leaves petioles and buds pruinose, opposite for few pairs then alternate, narrowly to broadly lanceolate, to 17 cm long, 1.1 cm wide, more or less discolours, green or greyish-green or glaucous; adult leaves petiolate, alternate, lanceolate, 9.5-22 cm long, 1-2 cm wide, greyish; reticulation dense with numerous intersectional oil glands. Inflorescences axillary, branchlets; peduncles to 1.8 cm long, 3-flowered; buds pedicellate, ovoid, to 1.7 cm long, 0.8 cm diam., no scar (2 opercula intact); operculum conical to beaked; stamens inflexed with outer staminodes anthers adnate, cuboid; ovules in 4 vertical rows; flowers white, rarely pink. Fruit pedicellate, truncate-globose, to 1.4 cm long, 1.4 cm diam.; staminal ring deciduous; disc descending; valves 5 or 6, below rim; seed brown, irregularly ovoid and slightly flattened, surface shallowly reticulate, hilum ventral (VicFlora 2018a; VicFlora 2018b).

Generation Length

The generation length of *Eucalyptus tricarpa* subsp. *decora* is estimated to be 30 to 70 years. For Eucalypts such as this taxon, generation length is typically estimated to lie within the 50-200 year range or more with a best estimate of at least 80 years. This is based on the presence of a well-developed lignotuber which permits an individual to re-sprout following damage to the canopy. This lower range was chosen because of time taken to reach reproduction which can be as little as 10 years under some circumstances.

Distribution

The taxon occurs in open woodlands and is known from two localities in the St. Arnaud district. It grows in close proximity to the type subspecies, however there is no evidence of interbreeding between them.

Habitat

The taxon's preferred habitat is gravely red loam on shallow laterite rises.

Threats

Subpopulations and habitat of the taxon are considered at risk from disturbance from firewood harvesting, which is certainly an ongoing threat especially in the Bealiba State Forest. All locations have been subject to extensive past land clearance, which remains a threat, particularly on freehold and unprotected land. In addition to clearance, sites are subject to habitat degradation and grazing pressure. Such habitat impacts could already be severely depressing natural regeneration. Climate change may lead to further decline due to increased drought severity and frequency, plus overall decline in rainfall.

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 Endangered

The population reduction over the last 90 to 210 years is estimated to be 60%, based on (a), (b), (c), (d) and (e) above.

Past reduction is based on clearing across the three known subpopulations, with highest reductions likely from Redbank and Maffra.

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

Eligible under Criterion A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 75%, based on (b), (c), (d) and (e) above.

Future decline is projected based on likely severe restrictions on regeneration in the two mostly fragmented subpopulations, and the impact of climate change especially on the central Victorian subpopulations.

Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 210-year period, including both past and future (up to 100 years in the future), is estimated to be 70%, based on (a), (b), (c), (d) 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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 4,337 km², and the Area of Occupancy (AoO) is estimated to be 24 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented, 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:

Eligible under Criterion C1 as Vulnerable

It is estimated that there are 3,000 to 7,000 mature individuals, based on records from the three known subpopulations. Although it has only ever recorded from three subpopulations, according to Rule (2004) it is highly likely that other remnant populations may have occurred in the region. However, Paul Foreman (pers. comm.) suggests that such likely occurrences, and possibly subpopulations, have been cleared.

There is estimated to be a continuing decline of 80% within three generations.

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 3,000 to 7,000 individuals, and 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

Rule, K. (2004), New taxa in *Eucalyptus* (Myrtaceae) for Victoria and notes on Victorian populations of *Eucalyptus calycogona. Muelleria* 20: 27-28

VicFlora (2018a). Flora of Victoria, Royal Botanic Gardens Victoria: *Eucalyptus tricarpa*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/46b30d64-1f21-4d71-a770-027910050d6c

VicFlora (2018b). Flora of Victoria, Royal Botanic Gardens Victoria: *Eucalyptus tricarpa* subsp. *decor*a Rule. Bealiba Ironbark. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/822dfec9-98c8-44fb-9c1f-23b0d8b13410