

Eucalyptus polyanthemos subsp. *longior* Forest Red-box

Taxonomy

Eucalyptus polyanthemos subsp. *longior* Brooker & Slee

This subspecies has narrower and longer leaves than the typical form. It often drops intact its whole androecium, which may be seen as yellowish rings of stamens and staminodes on the forest floor (VicFlora, 2017).

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 A2bce+4bce; B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a tree to 40 m tall; bark rough, grey or yellowish-grey. Juvenile leaves petiolate, opposite for few pairs then alternate, orbicular, often emarginate, to 6.5 cm long, 8 cm wide, dull, grey-green or green, not or slightly glaucous on stems and leaves; reticulation very dense, with sparse or obscure oil glands. Adult leaves broadly lanceolate to lanceolate, 9-14 cm long, 2.5-5 cm wide, green to blue-green. Inflorescences terminal panicles; peduncles to 1 cm long, 7-flowered; buds pedicellate, diamond-shaped, pruinose, to 0.6 cm long, 0.3 cm diam., scar present; operculum hemispherical to conical; stamens inflexed with outer staminodes; anthers adnate, cuboid; whole androecium may be shed intact as a ring; ovules in 4 vertical rows; flowers white. Fruit pedicellate, obconical, to 0.7 cm long, 0.4 cm diam.; disc descending; valves 3 or 4, below thin, often split, rim; seed brown, irregularly ovoid and slightly flattened, surface shallowly reticulate, hilum ventral. The taxon flowers in November, but imperfectly known (VicFlora, 2017).

Generation Length

The generation length of *Eucalyptus polyanthemos* subsp. *longior* is estimated to be 120 to 250 years. This is based on a plausible longevity of 150-250 years. 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 45-75 years.

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, a majority resprout 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 a Victorian near-endemic, apparently extending into New South Wales, although only in the Nungatta district. It occurs in the foothills of far eastern Victoria from near Bairnsdale at Mt Taylor, east to the NSW border at Wangarabell.

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Habitat

The taxon occasionally grows intermixed with *E. polyanthemus* subsp. *vestita* which is found on poor stony ground, usually on ridges and dry slopes of foothills, but more often a component of taller forests (VicFlora, 2017). Commonly associated Eucalypts include *E. baueriana*, *E. bosistoana*, *E. consideriana*, *E. croajingolensis*, *E. cypellocarpa*, *E. globoidea*, *E. globulus* subsp. *pseudoglobulus* and *E. ovata* subsp. *ovata*, *E. tereticornis* subsp. *mediana*, and *E. tricarpa* subsp. *tricarpa*. Quadrat data indicates that in some districts the taxon is consistently associated with the highly depleted *E. bosistoana* (Coast Grey-box) which occurs on deeper alluvial or colluvial soils in broad river valleys which have been targeted for agricultural clearance.

Threats

The taxon is likely to have suffered significant historic decline through habitat loss for agriculture, since a majority of records are for sites marginal to settlement. Current and future threats include climatic drying and warming, imposed anthropogenic fire regimes which act synergistically to increase fire risk, repeat fire events, and extreme drought stress. Recruiting stands may also be threatened by targeted browsing by native and exotic herbivores including wallabies, rabbits, Sambar Deer (*Rusa unicolor*) and stock.

The bushfires of 2019/2020 are believed to have impacted around 44% of the taxon's habitat, with a further 85% of the habitat projected to burn. The overall impacts of the fire are yet to be determined. The taxon is likely to be threatened by soil and vegetation disturbance as a result of fire recovery activities, such as machinery impacts or the removal of hazardous trees. Drought, hot weather, and repeat fires have the potential to damage or destroy recovering plants and/or seedlings.

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 style="text-align: center;">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 360 to 750 years is estimated to be 30 to 55%, based on (b), (c) and (e) above.

Past decline is based on historic habitat loss to agriculture which targeted the habitat of the taxon and its associated Eucalypts, such as *E. bosistoana* (Coast Grey-box).

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

Eligible under Criterion A4 as Endangered

The population reduction over any 360 to 750 year period, including both past and future (up to 100 years in the future), is estimated to be 45 to 55%, based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Future decline is based on the projected impact of the identified threats.

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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 3,952 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally and anthropogenically at the landscape scale, with most occurrences at spacings exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal, and is likely to be dispersed by ants (myrmecochory) at the metre scale only.

It is estimated to have 1 location, and has a continuing decline in (ii), (iii), (iv) and (v) above, based on the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 72 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 1 location, and has a continuing decline in (ii), (iii), (iv) and (v) above.

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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 total population size.

Criterion D. Very small or restricted populations		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:

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 (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Eucalyptus polyanthemos* subsp. *longior*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/582618e4-3906-40ff-a485-a86043c56678>