



Eucalyptus kitsoniana Bog Gum

Taxonomy

Eucalyptus kitsoniana Maiden

This taxon is not closely related to any other taxa. It is easily recognized by the large, thick, glossy leaves and tight, symmetric bud clusters with prominent bracts (VicFlora 2019).

Current conservation status

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

Proposed conservation status

Critically Endangered in Australia

Criteria A2abce+3bce+4abce

Species Information

Description and Life History

The taxon is a small tree to 8 m tall or mallee; bark smooth, yellow, white or grey, often shedding in ribbons. Crowns of reproductively mature trees often mixed juvenile and adult foliage. Juvenile leaves sessile for many pairs, orbicular to broadly lanceolate, to 10 cm long, 8 cm wide, concolorous, light green, glossy above, becoming petiolate, elliptic to lanceolate, remaining opposite to subopposite; adult leaves petiolate, alternate, lanceolate to broadly lanceolate, to 7.5-18 cm long, 1.5-3.5 cm wide, concolorous, glossy, green; reticulation dense, coarse, with numerous island and intersectional oil glands. Inflorescences axillary, unbranched, with prominent enclosing bracts when young; peduncles flattened, 0.7-2.5 cm long, 7-flowered; buds sessile, ovoid, to 0.9 cm long, 0.4 cm diam., scar present; operculum obtusely conical to hemispherical; stamens irregularly flexed; anthers dorsifixed, cuneate; ovules in 4 vertical rows; flowers creamy. Fruit sessile, cupular to hemispherical, to 0.8 cm long, 0.8 cm diam.; disc level to raised-annular; valves 3 or 4, rim level; seed brown-black, flattened-ellipsoid, shallowly reticulate, lacunose, hilum ventral. The taxon flowers from August to March (VicFlora 2019).

The habit varies from a shrubby mallee as low as 2 metres tall on exposed sites (e.g. on the summit of Mt Oberon) up to a single-stemmed tree up to 16 m tall in more sheltered sites, forming a lignotuber (Nicolle 2006).

Generation Length

The generation length of *Eucalyptus kitsoniana* is estimated to be 100 to 200 years. Field observations of the taxon in South Gippsland suggest a longevity of several hundred years or more. It is considered a weaker resprouter post-fire compared to strongly lignotuberous mallees, but in the absence of continuous stock grazing, it is still considered capable of several cycles of resprouting following crown removal, fire, and storm damage, which is common on Yanakie Isthmus.

Distribution

The taxon is endemic to Victoria. It occurs on coastal lowlands from Yarram west to Cape Otway, and Mt Richmond near Portland. It also occurs on top of Mt Oberon at Wilsons Promontory and on nearby Snake Island. An inland collection from near Woolhpooer west of the Grampians requires verification (VicFlora 2019).

E. kitsoniana is very useful for screening and shelter due to its dense crown, and it is commonly cultivated in southern Victoria and occasionally elsewhere in southern Australia. It is useful for broadscale planting in moderate-high rainfall sites with soils of impeded drainage. It is popular in horticultural plantings in revegetation sites throughout its South Gippsland range, particularly on the Yanakie Isthmus, and occasionally in woodlots for firewood where it resprouts post-harvesting in the absence of grazing.

Many site and specimen records, particularly those in highly degraded, weedy sites on freehold and roadsides, and often associated with other exotic trees, are assumed to be either plantings or locally adventive.

Habitat

The taxon usually occurs on level to slightly undulating terrain in locally swampy sites, or sometimes on elevated sites such as near Cape Otway and on the summit of Mt Oberon in Wilsons Promontory, where rainfall is high and drainage is impeded (Nicolle 2006). It is a habitat specialist and is often the only eucalypt recorded at the quadrat scale as the taxon often forms locally dominant pure stands, occupying sites to which very few eucalypts are adapted.

Threats

With the exception of small and isolated stands on Wilsons Promontory, between Cape Otway and Blanket Bay, and in the Kentbruck Heath on Moleside Creek in the Lower Glenelg National Park, most occurrences are remnant stands on road reserves, or isolated patches of crown land or private land in highly fragmented rural landscapes that were subject to very high levels of historic habitat loss.

The taxon is highly susceptible to browsing and trampling by cattle, with the major impact of stock presumably through the compaction of boggy soils. There has also been some historic decline to fire although the habitat is typically too wet to burn. It has not been intentionally exploited since the timber is considered poor firewood.

Future threats include accidental clearing through stock trampling, habitat loss and modification on road and coastal reserves (with intentional clearing of road reserves for maintenance and fuel reduction, and erosion of coastal reserves), burning of sites under grazing (as resprouting adults are highly susceptible to stock browsing immediately post-fire), and recruitment failure (as recruitment is observed only on ungrazed road reserves and public land).

The taxon is also potentially at increasing risk of adult mortality and recruitment failure in response to climatic warming and drying, increasing frequency, intensity and landscape scale of anthropogenic fire events, and the increasing risk of extreme drought events. Nicolle (2006) notes that the taxon is drought tender, suggesting that young seed recruits are at greater risk of drought-induced mortality than other eucalypts which are habitat generalists.

Pittosporum undulatum as an invader of *E. kitsoniana* habitat in South Gippsland is discounted as a threat, since *P. undulatum* is arguably indigenous across the region, and its apparent invasion is likely to be an artefact of settlement history rather than a genuine invasion as is clearly the case west of the Westernport catchment.

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;"><i>based on any of the following:</i></p> <ul style="list-style-type: none"> (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

The population reduction over the past 300 to 600 years is estimated to be 80 to 95% (midpoint 90%), based on (a), (b), (c) and (e) above.

Past decline is based on historic habitat loss to agriculture across most districts, particularly throughout South Gippsland which was the stronghold of the taxon at the time of settlement. This was exacerbated by stock browsing and trampling, and some density decline through imposed fire regimes. The upper bound estimate is based on field observations in South Gippsland.

The causes of the 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 80 to 90%, based on (b), (c) and (e) above.

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

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 300 to 600 year period, including both past and future (up to 100 years in the future), is estimated to be 90 to 99% (midpoint 95%), based on (a), (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 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 B as Endangered

The Area of Occupancy (AoO) is estimated to be 372 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, has 2 locations, and has a continuing decline in (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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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				

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Evidence:

Ineligible under Criterion C as Data Deficient

No reliable estimate of the total population size for the taxon is available.

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 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. 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

Nicolle, D. (2006). *Eucalypts of Victoria and Tasmania*. Melbourne: Bloomings Books.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Eucalyptus kitsoniana*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/e9aa87a9-41f4-4287-8404-0befbe488a73>