Threatened Species Assessment

Corymbia maculata
Spotted Gum

Taxonomy

Corymbia maculata (Hook.) K.D. Hill & L.A.S. Johnson

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criteria A3ce+4ce; D1+2

Species Information

Description and Life History

The taxon is a tree to 60 m tall; bark smooth, shedding in small, irregular flakes giving a spotted appearance. Juvenile leaves petiolate, opposite for few pairs, then alternate, elliptic to ovate, some peltate, to 23 cm long, 10.5 cm wide, early leaves hairy; adult leaves petiolate, alternate, lanceolate, to 21 cm long, 3 cm wide, concolorous, green; with regular, wide-angled pinnate side veins; reticulation very dense, with small island oil glands. Inflorescences compound in axils of upper leaves; peduncles to 2 cm long, 3(-7)-flowered; buds pedicellate, ovoid, to 1 cm long, 0.6 cm diam., scar absent; operculum conical or beaked; stamens inflexed; anthers cuneate; ovules in 4 or 5 vertical rows; flowers white or creamy-white. Fruit pedicellate, ovoid to slightly urceolate, 1.4 cm long, 1.1 cm diam.; disc vertically descending, lining tube; valves deeply enclosed; seed red-brown, flattened-elliptic, often keeled on dorsal side, hilum ventral. The taxon flowers July to September (VicFlora 2014).

This forest tree is very long-lived and resilient to drought and is somewhat resilient to bushfires, although it is not quite as resistant as many other species from the same forests. It is moderately fast growing from seed, but may take 25 years or so to reproduce a seedbank adequate to replace the stand in the event of a stand-destroying fire. It resprouts post-fire, but its bark thickness is not adequate to protect against the most intense fires. Contrary to other tree species in the same forests, it is able to occasionally regenerate from seed without fires, given a suitable gap is created, for example by tree disease or windthrow.

Generation Length

The generation length of *Corymbia maculata* is suspected to be 120 to 250 years, based on a plausible longevity of 150-350 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.

Like most eucalypts in fire-prone dryland habitats, the taxon recruits episodically, from an elevated or soil-stored seedbank, following intense wildfire events, with only a proportion of adults killed by fire, 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.

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other tree species in the same forests, it is able to occasionally regenerate from seed without fires, given a suitable gap is created, for example by tree disease or windthrow.

Distribution

In Victoria, the taxon is restricted (in the wild) to the Mottle Range, an extension of the Tara Range, between Buchan, Nowa Nowa and Orbost in East Gippsland (VicFlora 2014). The stand at this site occupies approximately 30 ha and is almost entirely protected within the Mottle Range Flora Reserve, an extension of the much larger Tara Range Park to its north. This is some hundreds of kilometres south of the nearest occurrence near Bega in NSW. There are numerous records elsewhere in Victoria, but these represent plantings and naturalisations from cultivation and are not included in this assessment, consistent with guidelines for the application of IUCN criteria to translocated populations. Most of these are in gardens or street trees, and almost all are derived from NSW stock.

Several historic collections from the Cann Valley suggest the taxon may once have occurred between Cann River and Noorinbee although these may also represent planted specimens.

Habitat

In Victoria, the habitat is open forests co-dominated by other eucalypts, including *Eucalyptus globoidea*. and *E. cypellocarpa*. Rainfall is moderately high and more or less evenly distributed throughout the year, with appreciable summer rainfall. Soils are moderately heavy clay loams, and the taxon is most common on broad ridges or other gentle slopes, not in moist gullies.

Threats

The major threats to the taxon are increased frequency and intensity of fire and climate change. Since the only known indigenous Victorian stand is largely protected within the Mottle Range Flora Reserve, the taxon is no longer threatened by timber harvesting which favours regrowth by faster growing eucalypts such as *E. globoidea* and *E. sieberi.* The forests in this area have been subject to major bushfires in 2019-2020 and are also subject to planned burning. Although the taxon can resprout post-fire, it is less tolerant of fire than most of the surrounding eucalypts, and unless there are occasional extended periods without fire, it may be out-competed by these other associated eucalypts. The taxon is also at increasing risk of recruitment failure in response to extreme and prolonged drought stress and, potentially, by targeted browsing of juveniles and epicormic resprouts by wallabies and Sambar Deer (*Rusa unicolor*).

The Mottle Range stand was severely burnt in early 2020 and recent field inspection has confirmed that adult individuals have resprouted successfully. The longer-term impact of this fire event require long-term monitoring of immediate or delayed adult mortality, recruitment success or failure and the potential impact of targeted browsing by native or exotic herbivores, as well as the ongoing impact of extreme drought stress during El Niño weather cycles.

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 A3 as Vulnerable

The population reduction over the next 100 years is projected to be 15 to 50% (midpoint 30%), based on (c) and (e) above.

Future decline cannot be estimated with any confidence since the identified threats are likely to operate stochastically and with unpredictable intensity.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 360 to 750 year period, including both past and future (up to 100 years into the future), is estimated to be 15 to 55% (midpoint 35%), based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

There is no evidence to suggest the taxon has been subjected to significant historic decline, since the only known indigenous stand has been intentionally protected from forestry operations for many decades and is now almost fully protected within the Mottle Range Flora Reserve, which is contiguous with the much larger Tara Range Reserve to its north.

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4 km², and the Area of Occupancy (AoO) across the taxon's range is also estimated to be 4 km², bur other thresholds under this criterion have not been met.

There are numerous records in Victoria outside of the Mottle Range, but these represent plantings and naturalisations from cultivation and are not included in the assessment of EoO or AoO,

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

It is estimated that there are 250 to 500 mature individuals, but other thresholds under this criterion have not been met.

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 250 to 500 mature individuals, based on field observations (David Cameron pers. obs.) between 1976 and 2019. The stand largely comprises widely spaced mature individuals at a low stocking rate, presumably resulting from many decades of natural self-thinning, spread across an estimated area of 30 ha.

The taxon is also estimated to be very restricted.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

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