Threatened Species Assessment

Acacia irrorata subsp. *irrorata*
Green Wattle

Taxonomy

Acacia irrorata subsp. *irrorata* Sieber ex Spreng.

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria B1ab(ii,iii,v); C1+2a(ii)

Species Information

Description and Life History

The taxon is a tree 5-12 m tall; smooth or sometimes finely fissured, dark grey or black; branchlets ribbed, hairy; ribs usually scabrous and with tufted hairs; young growth yellow. Leaves bipinnate, dark green; rachis c. 6-11 cm long, surface as for branchlets, with a gland at the junction of the uppermost 1-3 pinna pairs; pinnae in c. 10 pairs; pinnules in c. 35-55 pairs, crowded, linear, 2-4.5 mm long, c. 0.5-0.8 mm wide, within a single pinna more or less equal in length, margins hairy, apex obtuse and with pointed tuft of hair. Inflorescence a raceme or panicle; heads globular, c. 30-40-flowered, pale yellow, peduncles 5-8 mm long, hairy. Pod flatfish, straight or slightly curved, 7-10 cm long, 6-10 mm wide, irregularly constricted, dark brown, scabrous above seeds, with scattered, short, appressed hairs. Green Wattle (Figure 131g). The taxon flowers from Dec.-Jan (VicFlora 2016).

Generation Length

The generation length of *Acacia irrorata* subsp. *irrorata* is estimated to be 60 years. This is inferred from likely post-fire episodic recruitment at pre-settlement frequencies of 10 - 80 years with some continuous recruitment in response to small-scale localised disturbances. Acacias are perennial and have varying generation lengths, from long-lived to short-lived. In this taxon, the longevity is plausibly 10 - 80 years and recruitment is typically cued by fires at mean pre-settlement frequencies ranging from 30 - 100 years depending on rainfall and landscape context.

Distribution

The taxon is known only from a single river catchment in the Cann River area of East Gippsland.

Habitat

In Victoria, this taxon is found on the margins of warm temperate rainforest gullies.

Threats

Due to the restricted distribution in Victoria, this taxon is potentially threatened by inappropriate fire regimes. A lack of recruitment is possible if fires are too infrequent, as this would not allow fire to promote dormant soil-stored seeds to germinate. Alternatively, if fires are too frequent, this may potentially prevent plants building up a seedbank and thus recruitment after disturbance. The latter threat is potentially more likely due to climate change and climatic warming and drying, thereby increasing the frequency and severity of fires. Changing climate may also

induce drought stress in this mesic-adapted taxon. Extreme weather events may become more severe in the future due to climate change, and this may threaten this taxon in the habitat in which it occurs.

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 past 180 years is estimated to be 30 to 60%, based on (c) above.

It is thought that 96% of the taxon's modelled habitat was impacted by the 2019/20 fires, with perhaps 70% affected by high severity fire. Although the degree of damage has not yet been determined, it is likely that a number of plants were killed.

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is suspected to be 30 to 60%, based on (c) and (e) above.

The taxon may recover from damage of the 2019/20 fires, but it may be highly susceptible to post-fire impacts. There is also the risk of further future fires.

Eligible under Criterion A4 as Endangered

The population reduction over any 180 year period, including both past and future (up to 100 years in the future), is inferred to be 30 to 60%, based on (c) and (e) above.

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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 12 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

There are seven records of this taxon in the past thirty years, including three specimens (in total) in the National Herbarium of Victoria and observations from the VBA. All records are from within a single catchment (Mueller River) in the Cann River area of East Gippsland. A cultivated record (from Narre Warren) and a collection made in 1999 (Ariati) that was mapped to an incorrect GPS point were excluded, based on notes on the herbarium records. The Ariati collection is approximately 14km NW of the main massing of other collections, but it is mapped to an incorrect site based on the notes on the herbarium specimen (it should actually be with the main mass of collections). These collections thereby artificially increased the EoO substantially.

The taxon can be considered to occur in one location because it occurs in one geographically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present.

It has a continuing decline in (ii), (iii) and (v) above, based on the current and projected impact of the identified threats, in particular to its rainforest habitat.

Eligible under Criterion B2 as Endangered

The Area of Occupancy across the taxon's range is estimated to be 12 km², based on 2 x 2 km grids derived from accepted, post-1970 records from the VBA. As above, the taxon has I location and continuing decline in (ii), (iii) 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 Critically Endangered

It is estimated that there are 150 mature individuals. It is difficult to estimate the current population size as herbarium records do not provide any evidence for this. Communication with a collector (N. Walsh) provided an estimate of 50 individuals at one site. There are broadly three contiguous sites, therefore the total of estimated individuals was made as 50 plants per site.

A continuing decline of 20 to 50% is estimated to occur within one generation.

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 150 mature individuals. The number of mature individuals is estimated to continue to decline, and all plants occur in a single subpopulation.

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 Endangered

It is estimated that there are 150 mature individuals.

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.

DELWP (2020) *Victoria's bushfire emergency: biodiversity response and recovery. Preliminary report - Version 2.* Department of Environment, Land, Water and Planning. East Melbourne

VicFlora (2016). Flora of Victoria, Royal Botanic Gardens Victoria: *Acacia irrorata* subsp. *irrorata*. Retrieved from https://vicflora.rbg.vic.gov.au/flora/taxon/7156af41-8303-409e-bd41-0e7c51842009

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