Threatened Species Assessment

Marianthus bignoniaceus
Orange Bell-climber

Taxonomy

Marianthus bignoniaceus F. Muell.

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 B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a twiner with reddish-brown, finally glabrous stems. Leaves shortly petiolate, ovate or narrowly ovate, 12–50 mm long, 6–25 mm wide, variably pubescent, bases truncate or shallowly cordate. Flowers solitary or paired (rarely in 3s) in upper axils, pendent; sepals lanceolate, 4–5 mm long, hispid to villous; corolla pubescent, narrowly campanulate, 15–22 mm long, with obtuse, slightly spreading lobes 3–5 mm long, yellow near base, orange or salmon-pink above, splitting from base with age; stamens and style reaching to c. throat of tube. Capsule pubescent, narrowly obovoid 13–18 mm long, the 2 valves prominently veined on the inner face; style persistent; seeds cuboid, c. 1 mm long, densely papillate. The taxon flowers mainly between September and January (VicFlora 2020).

M. bigoniaceus is a long-lived twining vine to c. 3 m high. It is fire sensitive and recovers post-fire from a presumably long-lived, soil-stored seedbank. Recruitment is continuous but strongly pulsed after fire, and reproduction is only by seed. Its flowers are bisexual and pollinated by honeyeaters. The breeding system is unknown, that is, whether the plant is self-fertile or an obligate outcrosser. Gene-flow via pollen is not more than several hundreds of metres. Seeds are passively dispersed from the capsules with no apparent secondary dispersal mechanism.

Generation Length

The generation length of *Marianthus bignoniaceus* is suspected to be 30 to 50 years. This is based on the recurrent natural fire frequency in the habitat of this fire-sensitive taxon. It also recruits continuously between fires.

Distribution

M. bigoniaceus is endemic in the Grampians and Black Range in Victoria, and the Mt Lofty Ranges and Kangaroo Island in South Australia.

Habitat

The taxon occurs in dense, shrubby, open riparian forest and forest on lower slopes, as well as more elevated rocky sites, on well drained sandy and stony soils derived from Siluro-Devonian sandstone. Understories are typically moderately to heavily shaded.

Threats

Threats to the taxon include the effects of climate change such as decreased rainfall, increased evaporation, and extreme temperatures, and extreme rainfall events (1 in 100 year flooding) causing flash floods, soil erosion, and/or severe scouring of riparian environments, as affected the Grampians in January 2011. Other threats include increased frequency and intensity of fire, inappropriate timing (winter-spring) of planned burning, elevated fuel loads due to invasive woody weeds, especially *Acacia longifolia* (Sallow Wattle), which may elevate fire intensity and cause soil sterilisation and destruction of soil-stored seedbank, and soil loss from bare substrates that may occur as a result of severe post-fire rainfall events.

Other potential threats to the taxon include weed invasion, particularly *Acacia longifolia*, *Billardiera fusiformis* (Bluebell Creeper), and *Pittosporum undulatum* (Sweet Pittosporum), browsing by deer, particularly Sambar Deer (*Rusa unicolor*), Cinnamon Root-rot Fungus (*Phytophthora cinnamomi*), and decreased bird pollination success as the honeyeater guild declines because of reduced flowering and fragmentation of co-occurring floral resources.

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 90 to 100 years is suspected to be 30%, based on (c) 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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 2,193 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is inferred to have five locations as the main threats to the taxon have a non-reversible impact on the individuals of the taxon, occur in a stochastic manner, and have the potential over time to threaten the majority of individuals in the geographic area. These threats may operate at different time scales in geographically separated areas.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the impacts of the identified threats, particularly climate change and Sambar Deer browsing.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 248 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has five locations, 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:

Ineligible under Criterion C as Data Deficient

There is insufficient evidence to determine the number of mature individuals.

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 D2 as Vulnerable

The taxon is projected 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

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VicFlora (2020). Flora of Victoria, Royal Botanic Gardens Victoria: *Marianthus bignoniaceus.* Retrieved from https://vicflora.rbg.vic.gov.au/flora/taxon/902a94ea-a53d-48b1-a12b-2a1078f79867

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