Threatened Species Assessment

Pittosporum revolutum
Rough-fruit Pittosporum

Taxonomy

Pittosporum revolutum Dryand. ex W.T. Aiton

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,v)+2ab(i,ii,iii,v); C1

Species Information

Description and Life History

The taxon is a spreading, usually diffuse shrub to 1-4 m high, young branchlets and leaves conspicuously rusty-tomentose, older leaves glabrous, or retaining some hairs on undersurface. Leaves alternate or in pseudowhorls, ovate, elliptic, or obovate, 4-12 cm long, 3-6 cm wide, margins plane or undulate. Flowers sweet-scented, bisexual, in short terminal racemes, or stalked, umbel-like cymes; pedicels 4-15 mm long; sepals free, lanceolate, c. 5 mm long, minutely ciliate or pubescent; petals oblong, 10-20 mm long, yellow, recurved in upper third. Capsule broadly ellipsoid or globose, 12-20 mm long, dark brown, deeply wrinkled and warty, rusty-pubescent, thick-walled; inner face shallowly grooved, yellowish; seeds numerous, 3-5 mm long, red-brown. The taxon flowers from October to November (VicFlora 2016).

Generation Length

The generation length of *Pittosporum revolutum* is estimated to be 40 to 60 years. This taxon is known to continuously produce seedlings, with some juvenile plants and many seedlings observed within mature stands. The taxon presumably needs a canopy opening for juvenile plants to reach maturity.

Distribution

The taxon is rather uncommon from about Cann River eastwards to the New South Wales border, with a westerly disjunction at Mt Nowa Nowa, where it is locally common. The taxon also occurs in Queensland and New South Wales (VicFlora 2016).

Habitat

The taxon occurs in lowland dry forest and warm-temperate rainforest margins (VicFlora 2016).

Threats

The taxon is potentially threatened by imposed anthropogenic fire regimes and climatic warming and drying which, synergistically, increase the risk of recruitment failure in response to repeat fire events and extreme drought stress. Browsing by native and introduced animals (mainly deer) has also been recorded for this taxon. This may also reduce reproductive output and the establishment of seedlings.

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The bushfires of 2019/2020 are believed to have impacted around 63% of the taxon's modelled habitat, with a further 96% of modelled habitat projected to be damaged as of early January 2020. The overall impacts of the fire are yet to be determined. The taxon is likely to be threatened by feral herbivores, notably Sambar Deer (*Rusa unicolor*) and soil and vegetation disturbance as a result of fire recovery activities. Drought, hot weather and repeat fires have the potential to damage or destroy recovering plants and/or seedlings. The taxon's recovery depends on the effective control of the impacts of herbivores and by preventing soil disturbance following fire recovery.

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 Vulnerable

The population reduction over the past 120 to 180 years is inferred to be 20 to 40%, based on (b) and (c) above.

The past extent of this taxon is not known. It is likely that habitat loss and reduction in plants has occurred in the lower Genoa and Nowa Nowa regions.

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

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 100 years is projected to be 20 to 50%, based on (b), (c) and (e) above.

Future decline is based on more frequent fire and browsing pressure on germinants, leading to recruitment failure. This may impact a moderate to large proportion of this taxon's current distribution.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 120 to 180 year period, including both past and future (up to 100 years in the future), is projected to be 20 to 50%, based on (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 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 2,264 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is estimated to have 1 location as all key identified threats apply across its range and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (i), (ii), (iii) and (v) above based on the current and projected impact of the identified threats, such as inappropriate fire regimes, increasing frequency and intensity of bushfires, and climatic warming and drying.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 136 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is estimated to have 1 location and has a continuing decline in (i), (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 Endangered

It is estimated that there are 1,000 to 3,400 mature individuals. This is based on herbarium notes and notes from general observations. The largest population is likely to be near Nowa Nowa, where there are hundreds of plants. Plants tend to be more scattered in the east. It is estimated there are a few hundred plants at Now Nowa and possibly as few as 20-100 plants per 2 x 2 km² grid in the east.

There is estimated to be a continuing decline of 20 to 50% within two generations.

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

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

VicFlora (2016). Flora of Victoria, Royal Botanic Gardens Victoria: *Pittosporum revolutum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/69ec26b4-a57a-4631-b429-878aad7557ff