

## *Platylobium reflexum* Victorian Flat-pea

### Taxonomy

*Platylobium reflexum* I. Thomsps.

Previously included in a broadly defined *P. formosum* (VicFlora 2016).

### Current conservation status

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

### Proposed conservation status

Endangered in Australia

Criteria A3ce+4bce; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

### Species Information

#### Description and Life History

Weakly erect shrubs to 2 m high; stems glabrous to densely pubescent. Leaves opposite (occasionally some alternate), unifoliolate or simple; petiole 1-3(-8) mm long; lamina ovate, (1.5-)2-6 cm long, (1-)1.5-4 cm wide, base cordate to truncate, apex acute, apiculate. Flowers 1-4 per axil; pedicels distinct, exerted from bracts and scales; bracteoles flat, recurving in distal half, 3-7 mm long, overlapping with most of the calyx (prior to recurving), orange-brown, striate, glabrous, sometimes with scattered midline hairs; calyx with scattered spreading or appressed hair, upper lobes (5-)6-8 mm long (including tube), lower lobes 3.5-4 mm long; ovary pubescent. Pod with thin wing 0.6-2 mm wide beyond the upper sutural nerve, pubescent or at least the sutures hairy. Flowers September-December (Spring) (VicFlora 2016).

#### Generation Length

The generation length of *Platylobium reflexum* is estimated to be 60 to 150 (midpoint 100) years. This is based on an estimated longevity of 60-80 years; an inference that the taxon is an obligate seed regenerator with no record of root suckering, resprouting or rooting at the nodes; and that seed recruitment is predominantly episodic in response to fire at pre-settlement intervals of 60-100 years or more, from a long-persistent soil-stored seedbank which may survive beyond the longevity of each successive cohort of adult individuals.

#### Distribution

*Platylobium reflexum* is endemic to Victoria. It occurs in the Otway Ranges in south-western Victoria and between the Dandenong Ranges and Fumina in south-central Victoria, where it is locally very common (Thompson 2011). The taxon may plausibly have been introduced by aboriginal people to the Grampians prior to European settlement, since there are biogeographic affinities between the Grampians and Otway Ranges and since the pods and seeds of the taxon may have been of cultural significance.

#### Habitat

The taxon occurs in tall, wet and open forest (Thompson 2011; VicFlora 2016). Specimen records and quadrat data suggest the habitat range includes Cool Temperate Rainforest and Wet Forest and also extends to drier forests including Damp Forest or even Herb-rich Foothill Forest.

### Threats

The taxon has suffered historic decline through habitat loss to agriculture and peri-urban development. It may also have declined in response to habitat modification through forest utilisation, fire management and the application of planned burning at intervals below the tolerable fire interval for the taxon. The greatest current threat to the taxon is the imposition of anthropogenic fire regimes resulting in an increasing fire frequency and changing vegetation structure favouring other species including other *Platylobium* taxa. Repeat fire events may also increase the risk of seedbank depletion and ultimate exhaustion. Increasing fire frequency results from both climatic drying and warming and, particularly, from planned burning across the range of the taxon at increasing frequency. Many sites at the drier end of the habitat range near settlement are likely to be under pressure as asset management zones with imposed fire frequencies resulting in fire intervals consistently approaching 5 years, which is likely to be below the tolerable fire interval (TFI) for this particular species of *Platylobium*. These threats are compounded by the increasing risk of extreme drought events which increase the risk of recruitment failure.

The taxon may also be threatened by targeted browsing by Sambar, which are currently undergoing a population explosion across the narrow range of the taxon, increasing the risk of recruitment failure and seedbank depletion.

### 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>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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### Evidence:

#### Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is projected to be 30 to 80% (midpoint 50%), based on (c) and (e) above.

This is based primarily on the projected impact of increasing frequency, intensity and landscape scale and penetration of fire events coupled with the increasing risk of recruitment failure in response to extreme drought

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events. The magnitude of future decline is difficult to estimate with confidence given the potential for local density increase compensating for density decline and local extinction elsewhere.

### Eligible under Criterion A4 as Endangered

The population reduction over any 180 to 450 year period, including both past and future (up to 100 years in the future), is estimated to be 50 to 90 (midpoint 65)%, based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline is based on habitat loss to agriculture and peri-urban development. The impact on population density, and hence population size, of habitat modification is difficult to estimate noting that increasing fire risk in some sites may favour recruitment success over a range of frequencies and lead to a greater proportion of the seedbank recruiting and becoming mature individuals.

Future decline is based primarily on the projected impact of increasing frequency, intensity and landscape scale of fire events.

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 (EEO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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 3,015 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at both regional and landscape scales with individual occurrences at separations exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

It is estimated to have two locations. It has a continuing decline in (i), (ii), (iii) and (iv) above, based on the current and projected impact of the identified threats.

#### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 104 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VVBA. As above, it is severely fragmented, has 2 location and has a continuing decline in (i), (ii), (iii) and (iv) above.

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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 1,000-2,000 to 5,000-10,000 mature individuals, based on field observations and quadrat data suggesting the taxon can be locally common across a limited range of sites and habitats, but other thresholds under this criterion have not been met.

Criterion-D. Very small or restricted populations		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 <sup>2</sup> 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](https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)

Thompson, I.R. (2011), A revision of *Platylobium* (Fabaceae: Bossiaeeae). *Muelleria* 29(2): 171-172.



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VicFlora (2016). Flora of Victoria, Royal Botanic Gardens Victoria: *Platylobium reflexum*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/20e60839-99ac-4f82-9f69-134d21491009>.