

## *Acacia phasmoides* Phantom Wattle

### Taxonomy

*Acacia phasmoides* J.H. Willis

### Current conservation status

Listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2002).

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

### Proposed conservation status

Critically Endangered in Victoria

Criterion B1ab(iii,v)

### Species Information

#### Description and Life History

The taxon is an open shrub 1-4m high, stems silvery-grey, branches slender, hairs scattered, appressed, short, straight and silvery. Phyllodes distant, narrowly linear, 5-11 cm long, 1-2 mm wide, flat or (especially near base) quadrangular, incurved to twisted, glabrous to subglabrous, midrib prominent, roughened with minute papillae on margins and midrib. Heads 2 per axil, obloid to globular, c. 0.5-1 cm long, sessile; rachis densely hairy. Flowers 4-merous, light golden; sepals united, glabrous. Pods submoniliform, to 9 cm long, 2.5-4.5 mm wide, thinly coriaceous, curved to sigmoid, longitudinally veined, with scattered, appressed white hairs when young, subglabrous at maturity; seeds irregularly developed, subshiny, aril terminal. The taxon flowers from Nov-Dec. (VicFlora 2019).

#### Generation Length

The generation length of *Acacia phasmoides* is estimated to be 35 to 50 years. The generation time is difficult to estimate since recruitment may result from localised patchy fire events, for example, lightning strike and natural scarification through baking high temperatures in rocky habitat. The longevity is up to 40 years, with a generation length is nominally suggested at 50 years.

#### Distribution

This taxon is extremely localised in north-eastern Victoria and south-eastern NSW (Entwisle et al. 1996; Orchard and Wilson 2001).

In Victoria, it is confined to Pine Mt (Burrowa-Pine Mount National Park) in the state's north east, where it is known from two stands east of the summit area. The first stand consists of about 9 individuals; and the second is estimated to contain between 150 and 250 individuals of mixed age (NRE 2000).

#### Habitat

All populations occur on sandy or gravelly soils derived from granite.

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In Victoria, the taxon grows in woodland above 600 m altitude on granitic slopes in sheltered areas, where it grows in rocky country where soil cover is sparse and the annual rainfall is between 700 and 1000 mm. Overstorey species include stunted Red Stringybark (*Eucalyptus macrorhyncha*), Broadleaved Peppermint (*E. dives*) and Black Cypress-pine (*Callitris endlicheri*), with an understorey of Burgan (*Kunzea ericoides*), Green Grevillea (*Grevillea jephcottii*) and Broad-leaf Hop-bush (*Dodonaea rhombifolia*).

## Threats

Major threats requiring management include competition from pest plants, destruction from feral animals, inappropriate fire regimes and potential grazing by domestic stock, feral goats, pigs, rabbits and deer. The taxon tends to grow in damp and sheltered situations, therefore extended drought conditions is a severe threat. Climate change also poses a substantial threat to the taxon, through increased drying of sites. The effect of fire on germination from seed and the longevity of the soil seed bank are not known.

The taxon is potentially threatened by climate change-induced increase in fire frequency and intensity and drought impact on fire-induced recruitment. The taxon is also threatened by the expansion of goat populations in the district, for example, Mount Mittamatite.

## 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 40 to 70% (midpoint 50%), based on (c) and (e) above.

Future decline is based on the identified threats, including goat browsing.

### Eligible under Criterion A4 as Endangered

The population reduction over any 105 to 150 year period, including both past and future (up to 100 years in the future), is estimated to be 40 to 75%, based on (c) and (e) above.

There appears to have been a substantial past decline in abundance of Victorian populations. Future decline is based on the identified threats, including goat browsing.

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 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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 20 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The EoO has been made equal to the Area of Occupancy (AoO) to ensure consistency with the definition of AoO as an area within EoO.

The taxon is inferred to be severely fragmented naturally at the landscape scale with all known occurrences at separations greatly exciding the dispersal range of the taxon which has no specialised mechanism for long distance dispersal. The only plausible dispersal agents are ants (myrmecochory) which operate at the meter scale only.

It is estimated to have 1 location. It has a continuing decline in (iii) and (v) above, based on the identified threats, including goat browsing.

Continuing decline is based on the identified threats, including goat browsing.

### Eligible under Criterion B2 as Endangered

The AoO across the taxon's range is estimated to be 20 km<sup>2</sup>, based on accepted, post-1970 records from the (VBA). As above, the taxon is inferred to be severely fragmented, is estimated to have 1 location, and has a continuing decline in (iii) and (v) 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:

### Eligible under Criterion C1 as Endangered

It is estimated that there are 350 to 500 mature individuals. This is based on regular monitoring of the known populations.

There is suspected to be a continuing decline of 40 to 75% within two generations.

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 D as Vulnerable

It is estimated that there are 350 to 500 individuals, and 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.



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SAC (2002). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 515 *Acacia phasmoides*.

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