



## *Swainsona behriana* Southern Swainson-pea

### Taxonomy

*Swainsona behriana* F. Muell. ex J.M. Black

### 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 A2ce+3ce+4ce; B2ab(i,ii,iii,iv,v)

### Species Information

#### Description and Life History

The taxon is a prostrate or ascending perennial herb, to c. 15 cm tall; stems pubescent with spreading to divergent hairs; hairs basifixed or laterally attached at base. Leaves mostly 3-5 cm long; leaflets 9-13, narrow-elliptic to obovate, lateral leaflets 5-15 mm long, usually 1-3 mm wide, terminal leaflet somewhat longer, apices acute, rarely obtuse or retuse, both surfaces appressed-pubescent, or upper surface glabrous; stipules 2-5 mm long. Racemes subumbellate, mostly 2-7-flowered; flowers 7-10 mm long; calyx pubescent, hairs brown to black, teeth usually more or less equal to tube; petals purplish; standard 7-8 mm long, 9-12 mm wide, broad-ovate, clawed; keel c. 7-9 mm long, apex obtuse, twisted; style slightly twisted, tip inflexed or geniculate. Pod obloid, mostly 10-18 mm long, 3-7 mm wide, pubescent, stipe to c. 5 mm long; seeds c. 20, cordate, c. 1.7 mm long, olive-green to brown. The taxon flowers from August to January (VicFlora 2019).

#### Generation Length

The generation length of *Swainsona behriana* is estimated to be 30 to 50 years. This is based on a plausible longevity of 25 years or more and the likelihood that the taxon recruits episodically from a long-persistent soil-stored seedbank following fire at pre-settlement intervals of 5-45 years or more, depending on habitat and landscape context. The taxon also resprouts readily from the rootstock following mild fire events and, with lower confidence, close browsing by herbivores. Recruitment is also cued by localised small-scale disturbance events (continuous or opportunistic trickle recruitment).

#### Distribution

The taxon is rare, widespread, but sporadic in Victoria, mostly in lowlands west of Melbourne, but extending to montane areas in the east in, for example, the Omeo, Cobungra, and Gelantipy districts. A 2011 record of *S. monticola* A.Cunn. ex Benth. from near Suggan Buggan in eastern Victoria was based on a mis determined specimen of *S. behriana* (VicFlora 2019).

#### Habitat

The taxon is usually found in grassland and grassy woodland on relatively fertile soils (VicFlora 2019).

### Threats

The taxon has suffered severe depletion throughout its range through habitat loss and degradation from agricultural and other land management practices, including heavy continuous grazing and cultivation, roadside management, and fuel reduction measures such as ploughed mineral-earth firebreaks.

The taxon is highly palatable and is therefore subject to browsing by rabbits, kangaroos, wallabies, goats, sheep, and cattle. It is also threatened by weed invasion by both perennial and annual exotics and many occurrences are threatened by incremental habitat loss and habitat degradation in response to agricultural intensification.

The taxon is highly susceptible to regular late-spring and early-summer burning which destroys flowers and seeds, and it is thus virtually absent from railway reserves throughout its former range, consistent with another threatened member of the Fabaceae, namely *Glycine latrobeana* (Clover Glycine) (Carter and Sutter 2010). It may also be threatened by competition in the prolonged absence of fire. Climatic drying and warming may also increase the risk of recruitment failure and adult mortality in response to extreme drought stress.

All these threats can result in seedbank depletion and local extinction.

### 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 style="text-align: center;">based on any of the following:</p> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

### Evidence:

#### Eligible under Criterion A2 as Endangered

The population reduction over the past 90 to 150 years is estimated to be 60 to 80% (midpoint 70%), based on (c) and (e) above.

Past reduction is based on habitat loss to agriculture across the Victorian range of the taxon, and habitat degradation in response to a wide range of management practices.

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

### Eligible under Criterion A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 40 to 60%, based on (c) and (e) above.

Future reduction is based on the projected impact of the identified current and future threats.

### Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is estimated to be 50 to 80% (midpoint 65%), based on (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 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 216 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales and anthropogenically at the landscape scale, with all geographically isolated occurrences at separations greatly exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. The only plausible vectors are ants (myrmecochory) which operate at the metre scale (Berg 1975).

It is estimated to have 3 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the current and projected impact of the identified threats, such as browsing by herbivores, weed invasion, and agricultural intensification.

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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 250 to 2,000 (midpoint 1,000) mature individuals, and there is estimated to be a continuing decline of 25 to 60% 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 250 to 2,000 (midpoint 1,000) 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

Berg, R.Y. (1975). Myrmecochorous plants in Australia and their dispersal by ants. *Australian Journal of Botany* 23: 475-508.



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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)

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