

## *Swainsona swainsonioides* Downy Swainson-pea

### Taxonomy

*Swainsona swainsonioides* (Benth.) A.T. Lee ex J.M. Black

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1997).

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

### Proposed conservation status

Endangered in Victoria

Criteria A2bce+3ce+4bce; B2ab(i,ii,iii,v)

### Species Information

#### Description and Life History

Spreading, ascending perennial herb or sub-shrub to 1 m tall; stems with a sparse to dense cover of spreading or antrorsely curved, basifixed, tuberculate hairs c. 0.5 mm long. Leaves 3-12 cm long; leaflets 11-21, broadly or narrowly obovate or elliptic, sometimes lanceolate, leaflets 5-20 mm long, mostly 4-6 mm wide, apices acute or obtuse, rarely retuse, with a small recurved point, upper surface usually glabrous, lower surface pubescent; stipules to 15 mm long, oblique. Racemes mostly 6-15-flowered; flowers usually 8-15 mm long; calyx virtually glabrous, teeth longer than tube; petals purple; standard 6-16 mm long, 9-22 mm wide, elliptic, shortly clawed; keel 8-12 mm long, apex long, slender, acute, upcurved then recurved, strongly twisted, tip blue; style tip incurved or inflexed, with few or no hairs below. Pod ellipsoid to obloid, 15-35 mm long, 5-8 mm wide, inflated, curved, shortly pubescent, stipe minute; seeds to c. 20, obliquely cordiform, c. 2.5 mm long, brown. The taxon flowers mainly between August and November (VicFlora 2019).

#### Generation Length

The generation length of *Swainsona swainsonioides* is estimated to be 15 to 40 years. This is estimated from likely post-fire episodic recruitment at pre-European settlement frequencies of 3 -7 years with additional continuous recruitment in response to small-scale localised disturbances. This is dependent on rainfall and landscape context. The taxon's longevity is plausibly 5 - 20 years, although persistence in the seed bank may be for greater than 50 years. Integrating these estimates, generation time is estimated conservatively to be 14 - 25 years under current conditions, and under pre-European settlement conditions, in the range of 25-75 years.

#### Distribution

In Victoria, the taxon is mainly confined to the north-west but there is an isolated record from near Benalla in the north-east.

#### Habitat

The taxon occurs in native grasslands, grassy woodlands or herblands on fertile clay soils on the Riverina and Wimmera plains. These communities are either dominated by Wallaby-grasses such as *Danthonia setacea* (Bristly Wallaby-grass) or *Danthonia caespitosa* (Common Wallaby-grass) or daisies and other broad-leaved herbs such as *Leptorhynchos squamatus* (Scaly Buttons) or *Chrysocephalum apiculatum* (Button Everlasting). The sites on which

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the taxon grows are either treeless or open woodlands of *Eucalyptus leucoxylon* (Yellow Gum) or *Eucalyptus largiflorens* (Black Box) with scattered shrubs of *Allocasuarina luehmannii* (Buloke), *Hakea tephrosperma* (Hooked Needlewood) and *Acacia oswaldii* (Umbrella Wattle). The endangered *Vittadinia pterochaeta* (Winged New Holland Daisy) is often associated with this species.

### Threats

There is likely to have been a historic decline due to loss of habitat in developing agricultural landscapes, compounded by subsequent management regimes, including intensive stock grazing, cropping, irrigation, pugging in wet weather, pasture improvement, road improvement and weed management (DSE 2001).

Ongoing threats are conversion of its habitat to agriculture and habitat degradation due to grazing by domestic stock. Other threats include cultivation of previously uncultivated paddocks, loss of genetic vigour because of inbreeding due to isolation, ploughing of firebreaks, roadworks, weed invasion and unsuitable management of native grasslands causing grasses to become over-dominant.

Given that the taxon is able to regenerate following above average rainfall events, it is likely that it will persist under climate change, although the period between events is likely to influence local persistence of the taxon.

### 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> <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 45 to 120 years is estimated to be 50 to 85% (midpoint 70%), based on (b), (c) and (e) above.

This is based on past loss of habitat due to cropping and stock grazing.

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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 45 to 100 years is estimated to be 30 to 80% (midpoint 55%), based on (c) and (e) above.

Future decline is linked to loss of fitness under current management regimes and ongoing reduction of habitat quality of grassy ecosystems

### Eligible under Criterion A4 as Endangered

The population reduction over any 45 to 120 year period, including both past and future (up to 100 years in the future), is estimated to be 50 to 85% (midpoint 70%), 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 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, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA, is estimated to be 188 km<sup>2</sup>.

The taxon is inferred to be severely fragmented. Many subpopulations are separated by areas of unsuitable habitat (i.e. agricultural land) at distances that do not allow for exchange of reproductive material. Many are very small and their survival is precarious. The taxon also has no means for long distance dispersal, and little opportunity to recolonise if a subpopulation becomes extinct.

It has a continuing decline in (i), (ii), (iii) and (v) above, due to the current and projected impacts of the identified threats.

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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 as Data Deficient

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

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:

#### Ineligible under Criterion D

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

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.

DSE (2001) Flora and Fauna Guarantee Action Statement no. 126. Twelve threatened Swainson-peas and Darling-peas (*Swainsona* species). Department of Sustainability and Environment, Melbourne.



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SAC (1997). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 452 *Swainsona swainsonioides*.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Swainsona swainsonioides* Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/fce2916b-6543-4b82-802e-cd3dc27b4afb>