



Swainsona brachycarpa Slender Swainson-pea

Taxonomy

Swainsona brachycarpa Benth.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1991)

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

Proposed conservation status

Endangered in Victoria

Criteria B1ab(iii)+2ab(iii)

Species Information

Description and Life History

Prostrate or ascending perennial herb, to c. 10 cm tall; stems glabrous or tuberculate; tubercles bearing minute appressed or divergent basifixed hairs. Leaves mostly 2-10 cm long; leaflets 9-23, narrow-elliptic to ovate, lateral leaflets 2-12 mm long, usually 1-4 mm wide, apices emarginate, both surfaces virtually glabrous; stipules c. 1 mm long. Racemes, mostly 2-6-flowered; flowers 6-10 mm long; calyx more or less glabrous, teeth shorter than tube; petals white to purplish or dark red; standard c. 10 mm long, 6-12 mm wide, suborbicular, clawed; keel 6-9 mm long, obtuse, retracted or with a short beak; style tip straight, incurved or strongly inflexed, tufted. Pod ellipsoid to crescent-shaped, mostly 15-30 mm long, 4-9 mm wide, inflated, glabrous, stipe 2-3 mm long; seeds to c. 15, reniform to cordate, c. 1.8 mm long, brown. The taxon flowers from November to January (VicFlora 2019).

Generation Length

The generation length of *Swainsona brachycarpa* is estimated to be 20 to 40 years. The taxon is a perennial herb. It presumably recruits in response to favourable rainfall events and possibly in response to fire to some degree. The interval of fire events prior to European settlement in the habitat of the taxon may have been every 25-40 years. It has long-persistent, soil-stored seed.

Distribution

The taxon is extremely rare in Victoria and apparently confined to the Grampians. It also occurs in Queensland and New South Wales (NSW).

Habitat

In Victoria, the taxon grows in tall open-forest, dominated by *Eucalyptus viminalis* (Manna Gum) and *E. obliqua* (Messmate Stringybark) with a grassy understorey of *Poa ensiformis* (Sword Tussock-grass) and mixed herbs.

Outside Victoria, the taxon appears to have a broader habitat preference. In northern NSW, the taxon occurs in grassland and woodland, often on rocky sites and in loamy soil, including *E. pauciflora* (Snow Gum) woodland at 1500 metres above sea level. In Queensland it has been collected from grassland on heavy black clay soil, with *Themeda avenacea* (Oat Kangaroo-grass) and *Dichanthium sericeum* (Silky Blue-grass).

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Threats

The taxon is potentially threatened by inappropriate fire regimes and climatic warming and drying which, acting together, increase the risk of recruitment failure. Browsing and trampling by Red Deer (*Cervus elaphus*) and other herbivores might be a threat at some of the sites. The taxon's damp, lush-foliaged habitat is preferentially browsed and may be trampled. It is unknown if any parts of the plant are toxic to herbivores as is the case with some *Swainsona* species.

One of the occurrences is less than 100 metres from the Halls Gap-Dunkeld Road and is potentially threatened by weed invasion, and inappropriate track or roadside management. This site is described as ca. 13 km S of Halls Gap near Stawell Water Supply Weir just east of the Halls Gap - Dunkeld Road. The notes on the specimen held by the National Herbarium of Victoria, Royal Botanic Gardens Victoria (MEL) indicate that the plants at this site were collected on raised ground pushed up by a bulldozer.

The Grampians occurrence is remarkably disjunct from its nearest neighbour in northern NSW. The separation vastly exceeds the dispersal range of the taxon. The variability of the Grampians gene pool is unknown.

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> <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>			

Evidence:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been, or will be, a reduction in population sufficient to meet any threshold for Criterion A.

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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 ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 58 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

The taxon is considered to occur in one to five locations as all key identified threats (climatic drying and drought, deer, possible weed invasion of some sites, and possibly inappropriate track management) apply across all five subpopulations and can rapidly affect all individuals of the taxon present. One or more of these threats might impact all subpopulations, or apply differently to each.

It has a continuing decline in (iii) above.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) is estimated to be 24 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has one location and has a continuing decline in (iii) 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 800 mature individuals, 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 ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D1 as Vulnerable

It is estimated that there are 800 individuals. The estimate of the number of mature individuals given here is taken from the Flora and Fauna Guarantee Action Statement (DSE 2003). Collectors' field observations make no mention of population size.

Eligible under Criterion D2 as Vulnerable

The taxon is inferred to be very restricted.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.



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References

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.

DSE (2003). *Twelve threatened Swainson-peas and Darling-peas (Swainsona species). Action Statement No. 126. Flora and Fauna Guarantee Act 1988*. Department of Sustainability and Environment, Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0024/32658/Red-Swainson-pea_Twelve_threatened_Swainson-peas_and_Darling-peas_Swainsona_species.pdf

SAC (1991). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 172 *Swainsona brachycarpa*.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Swainsona brachycarpa*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/afa36744-4560-4243-80df-7c9a2163305b>