Threatened Species Assessment

Swainsona plagiotropis
Red Swainson-pea

Taxonomy

Swainsona plagiotropis F. Muell.

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 1991).

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

Species Information

Description and Life History

The taxon is a prostrate or ascending perennial herb, to 15 cm tall; stems glabrous or sparsely covered with appressed or loosely antrorse, basifixed or subbasifixed hairs. Leaves mostly 5-12 cm long; leaflets 13-25, narrow-obovate to narrow-lanceolate, leaflets 10-17 mm long, 1-4 mm wide, apices acute to obtuse, upper surface glabrous, lower surface with scattered hairs; stipules broad-ovate, 5-9 mm long, oblique, margins erose or sometimes minutely toothed. Racemes 2-5-flowered; flowers mostly 10-15 mm long; calyx more or less glabrous, teeth longer than tube; petals reddish-purple; standard 12-15 mm long, 10-20 mm wide, broad-ovate, almost truncate, shortly clawed; keel 9-10 mm long, strongly twisted near centre, apex projecting upward, acute; style tip straight, with a ridge of hairs below. Pod ovoid to obloid, 15-25 mm long, 8-10 mm wide, inflated, curved, pubescent, stipe to c. 0.5 mm long; seeds to c. 20, reniform, to c. 3.5 mm long, brown. Flowers August-November (VicFlora 2019).

Generation Length

The generation length of *Swainsona plagiotropis* is estimated to be 14 to 25 years. This is based on likely post-fire episodic recruitment at frequencies of 3 -7 years prior to colonisation, with some continuous recruitment in response to small-scale localised disturbances. Longevity is plausibly 5 - 20 years, although persistence in the seed bank may be for greater than 50 years, and recruitment is historically cued by fires at pre-colonisation frequencies ranging from 2 - 7 years depending on rainfall and landscape context. Integrating these estimates, generation time is estimated conservatively to be in the range 14 to 25 years. Generation length under decolonised regimes may be in the range of 25 to 75 years, however a conservative estimate of 14 to 25 years has been used.

Distribution

It is a rare taxon, apparently restricted to a few sites in north-central Victoria mostly between Bendigo and the Murray River, and is now almost confined to roadside remnants (VicFlora 2019).

Habitat

The taxon occurs within the 350-450mm average annual rainfall band, in relatively open native grassland vegetation on seasonally waterlogged red-brown clay and clay loam soils. The vegetation is dominated by perennial native grasses including Wallaby-grasses (*Austrodanthonia*) taxa, Spear-grass (*Austrostipa*) taxa and Spider-grass (*Enteropogon acicularis*), often with scattered small shrubby bluebushes (*Maireana pentagona, M. excavata* and *M. humillima*) (Tonkinson and Robertson 2010).

Threats

The main threats to the taxon are the cultivation of habitat, and grazing of plants by domestic stock. Given that the taxon is able to regenerate following above average rainfall events, it is likely to persist under climate change, although the period between events is likely to drive local persistence.

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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Eligible under Criterion A2 as Endangered

The population reduction over the past 42 to 75 years is inferred to be 50 to 75%, based on (b), (c) and (e) above.

Past reduction is based on over 50% of the habitat of the taxon being lost since 1990.

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 42 to 75 years is projected to be 25 to 80% (midpoint 50%), based on (c) and (e) above.

Future decline is based on the loss of fitness of the taxon under current management regimes which are largely driven by grazing by domestic stock. This is likely to reduce the generation length as well as the density of the population through the gradual loss of individuals from populations and reduced recruitment rates. Likewise, the absence of fire as a driver of species recruitment and persistence is also likely to influence its persistence, and these factors, combined with a continued decline in the habitat quality of grassy ecosystems, are likely to see the continued reduction in the short and medium term.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 42 to 75 year period, including both past and future, is inferred to be 45 to 75%, 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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8,510 km² and the Area of Occupancy (AoO) is estimated to be 312 km², but other thresholds under this criterion have not been met.

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 population			
	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 km2 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

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