

Swainsona stipularis Orange Darling-pea

Taxonomy

Swainsona stipularis F. Muell.

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A2ce+4ce; B1ab(i,ii,iii,iv,v)c(iv)+2ab(i,ii,iii,iv,v)c(iv)

Species Information

Description and Life History

The taxon is a spreading to ascending perennial herb, to c. 50 cm high; stems densely pubescent with \pm appressed medifixed hairs. Leaves 3-9 cm long; leaflets 5-11, broad linear-elliptic to broad obcuneate or obcordate, lateral leaflets 9-12(-20) mm long, mostly 2-4 mm wide, apices acute to emarginate and mucronate, both surfaces densely pubescent; stipules 3-lobed, to 15 mm long, often broader than long. Racemes mostly 5-20-flowered; flowers (7-10-15 mm long; calyx pubescent, teeth shorter than tube; petals orange-red, sometimes brown, less commonly yellow or purple; standard 9-14 mm long, 10-15 mm wide, broadly ovate to orbicular, clawed; keel 8-14 mm long, semicircular, apex obtuse, often curved upwards, usually twisted laterally; style tip stiff, incurved. Pod narrow-obovate or somewhat fusiform. 10-30 mm long, 3-5 mm wide, inflated, pubescent, stipe to c. 1 mm long; seeds to c. 20, cordate, c. 2 mm long, mottled brown. The taxon flowers mainly from September to November (VicFlora 2016).

Generation Length

The generation length of *Swainsona stipularis* is estimated to be 5 to 25 years. This is based on the taxon's perennial forb habit and the likelihood that, with favourable summer rain, the taxon persists through summer. It is also based on the likelihood that the taxon recruits from a long-persistent, soil-stored seedbank in good seasons at intervals determined by La Niña and El Niño cycles.

Distribution

The taxon is currently rare in Victoria and known only from two sites on freehold land on the eastern and south-eastern sides of Lake Tyrell (VicFlora 2016).

A 1979 specimen purporting to have been collected at Barmah Forest near Echuca is now considered to have been collected in inland South Australia, along with the only previously recognised Victorian specimen of *Menkea crassa*.

Habitat

The taxon is known in Victoria only from the crest of lunettes near Lake Tyrell. Its habitat is on freehold land, currently used for grazing. Soils are gypsiferous, light-clay flats and sandy rises (VicFlora 2016). Associated taxa include *Sida intricata* (Twiggy Sida), *Minuria cunninghamii* (Bush Minuria), *Sida fibulifera* (Pin Sida), and *Austrostipa nodosa* (Knotty Spear-grass).

Threats

The taxon is highly threatened by historic, current and projected agricultural activity including cropping, grazing and competition from agricultural crops and exotic weeds. The taxon may also be threatened by recruitment failure and seedbank depletion and exhaustion in response to extreme drought stress.

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"> (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 Critically Endangered

The population reduction over the past 15 to 75 years is estimated to be 80 to 95%, based on (c) and (e) above.

This estimate of past decline is based on the taxon's distribution being restricted to freehold land which has been heavily grazed or cropped for many decades. It is also based on the likelihood that seedbank depletion and exhaustion has resulted in local extinction across a very significant proportion of its pre-European settlement range.

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 15 to 75 years is projected to be 30 to 80% (midpoint 50%), based in (c) and (e) above.

Future decline is in response to intensive agricultural activity which likely to result in a high risk of local extinction. However, the magnitude of this decline within the next three generations cannot be estimated with any significant confidence given that future land management practices cannot be predicted, and the taxon may persist as a seedbank despite some intensive practices.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 15 to 75 year period, including both past and future (up to 100 years in the future), is estimated to be 85 to 99%, 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 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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to be severely fragmented anthropogenically at the landscape scale. It has no specialised mechanism for long-distance dispersal. The only known stands occur at distances greatly exceeding the dispersal range.

It is estimated to have one location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the continuing impact of agricultural activity including cropping and grazing, competition from agricultural crops and exotic weeds, and extreme drought stress.

It is inferred to have extreme fluctuations in (iv) above in response to seasonal conditions. Like all *Swainsona* taxa, it is likely to recruit successfully from a long-persistent soil-stored seedbank which is likely to greatly outlive each cohort of adult plants. The fact that the taxon remained unrecorded in Victoria prior to 2004 supports the inference that population size fluctuates significantly between successive recruitment events.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As noted above, the taxon is severely fragmented, has one location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) and extreme fluctuations in (iv) 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 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 ² or number of locations ≤ 5

Evidence:

Eligible under criterion D2 as Vulnerable

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. 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



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VicFlora (2016). Flora of Victoria, Royal Botanic Gardens Victoria: *Swainsona stipularis*. Retrieved from:
<https://vicflora.rbg.vic.gov.au/flora/taxon/e958f2e4-a9b4-4bc7-8922-2f04bee59472>