

# Threatened Species Assessment



## *Swainsona murrayana* Slender Darling-pea

### Taxonomy

*Swainsona murrayana* Wawra

### 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 1993).

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

Erect, ascending or prostrate perennial herb, to 25 cm tall; stems densely pubescent with appressed medifixed hairs. Leaves mostly 5-10 cm long; leaflets 3- 11, linear-lanceolate to elliptic, lateral leaflets 5- 30 mm long, 1- 2 mm wide, terminal leaflet usually conspicuously longer than laterals, apices narrowly acute with a recurved point, both surfaces sparsely pubescent to virtually glabrous; stipules triangular to linear, c. 2-7 mm long, sometimes broadly toothed. Racemes mostly 3-11-flowered; flowers c. 10 mm long; calyx with base spirally twisted, dark pubescent, teeth shorter than tube; petals pink or purple; standard c. 10 mm long, 7-8 mm wide, often asymmetric, clawed; keel 7-9 mm long, obtuse, tip beak-like, strongly twisted; style tip stout, incurved. Pod narrow-ellipsoid, mostly 20-65 mm long, 4-7 mm wide, inflated, sparsely pubescent, stipe c. 0.5 mm long; seeds to c. 20, cordate-reniform, c. 2 mm long, dark brown. Flowers Aug.-Nov (VicFlora 2019).

#### Generation Length

The generation length of *Swainsona murrayana* is estimated to be 14 to 25 years. This is inferred from 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. The longevity is plausibly 5 - 20 years, although persistence in the seed bank may be for greater than 50 years. Recruitment is historically cued by fires at mean 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 - 25 years. Generation length may be far greater and under decolonised regimes may be in the range of 25-75 years.

#### Distribution

The taxon occurs from South Australia through south-west Victoria and central NSW to south-east Queensland (TSSC 2008). In Victoria, records are scattered from the south-west through to the central north of the state, including the Echuca area and most notably in Terrick Terrick National Park (TSSC 2008).

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### Habitat

The taxon is found in grassland, herbland, and open Black-box woodland, often in depressions. It grows in heavy grey or brown clay, loam, or red cracking clays (TSSC 2008). It is often associated with low chenopod shrubs (*Maireana spp.*), wallaby-grass (*Austrodanthonia spp.*), and spear grass (*Austrostipa spp.*) It may require some disturbance and has been known to occur in paddocks that have been moderately grazed or occasionally cultivated (TSSC 2008).

### Threats

The main identified threats include grazing from domestic stock and rabbits (*Oryctolagus cuniculus*); weed invasion; cultivation; and roadside maintenance activities. The main potential threats include habitat destruction by goats (*Capra hircus*) and feral pigs (*Sus scrofa*); salinisation of habitat; urban development in grassland habitat; and inappropriate fire regimes. 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 drive 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>	<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>
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### 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.

The reduction in the taxon's habitat (as an analogue for population) over the past 42-75 years has been in excess of 50-80% of current extent. Over 50% of the habitat has been lost since 1990, so an estimate of 50-80% is seen as conservative.

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

**Evidence:**

**Eligible under Criterion A3 as Endangered**

The population reduction over the next 42 to 75 years is inferred to be 25 to 80% (midpoint 50%), based on (b), (c) and (e) above.

The continued decline will be linked to the taxon's loss of fitness under current management regimes, which are largely driven by the use of grazing by domestic stock. This is likely to reduce 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 the persistence of the species.

These factors combined with a continued decline in the habitat quality of grassy ecosystems is likely to see the continued reduction in populations of this taxon in the short and medium term.

**Eligible under Criterion A4 as Endangered**

The population reduction over any 42 to 75 year period, including both past and future, is inferred to be 50 to 70%, based on (a), (c) and (e) above.

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 Extent of Occurrence (EoO) across the taxon's range, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA), is estimated to be 24,385 km<sup>2</sup>, which exceeds the threshold for criterion B.

The Area of Occupancy (AoO) across the taxon's range, based on 2 x 2 km grids derived from accepted, post-1970 VBA is estimated to be 224 km<sup>2</sup>.

The taxon is severely fragmented naturally at the subregional scale and anthropogenically at the landscape scale. Geographically isolated stands occur at separations that are likely to exceed the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

It has a continuing decline in (i), (ii), (iii) and (v) 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 <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

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