



Senna aciphylla Sprawling Cassia

Taxonomy

Senna aciphylla (Benth.) Randell

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A3ce+4ce; B2ab(iii,v)

Species Information

Description and Life History

The taxon is an erect or sprawling shrub to 2 m high. Leaves 3-5 cm long; glands between all leaflet pairs, stipitate, to 3 mm long; leaflets in 8-12 pairs, linear to narrowly elliptic, mostly 20-25 mm long, 14 mm wide, increasing in size from base of leaf, glabrous to pubescent, margins usually revolute, apex acuminate, mucronate; stipules 4-6 mm long, acicular, semi-persistent. Inflorescences 2-3-flowered; peduncles 2-5 cm long; pedicels 10-15 mm long; bracts usually caducous at anthesis. Sepals obovate, c. 5 mm long; petals 10-15 mm long; fertile stamens 10; anthers subequal, c. 4 mm long, or 1 slightly longer; filaments sub-equal, c. 1 mm long. Pod linear, 6-8 cm long, 5-6 mm wide, oval in section. Seeds several, ovate, c. 4 mm long, brown, glossy. The taxon flowers from spring to summer (Vicflora 2017).

Generation Length

The generation length of *Senna aciphylla* is estimated to be 30 to 80 (midpoint 50) years. The taxon is likely to be a fire-sensitive, obligate, seed regenerator that recruits episodically post-fire from a long-persistent, soil-stored seedbank. This is probably supplemented by some opportunistic recruitment in response to localised site disturbance events or optimal seasonal conditions. Pre-settlement fire intervals are likely to have been 30-50 years or more with patchy effects since fuel accumulation is slow and patchy in dry rocky habitats. The plant is likely to resprout following only the mildest of fires.

Distribution

The taxon is confined in Victoria to the east where it occurs discontinuously from the Licola to Genoa districts and inland to the Suggan Buggan district with local concentrations near Culloden, Tambo Crossing, Bindi, the Upper Snowy Rainshadow and the Genoa River Gorge. It also occurs in Queensland, New South Wales and the Australian Capital Territory (VicFlora 2017).

Habitat

In Victoria, the taxon usually occurs on rocky slopes in woodland and scrubs, sometimes along watercourses (VicFlora 2017).

Threats

Since the taxon's dry rocky habitat is of low productivity, it is likely to have suffered only a minor historic decline through conversion to agriculture. In some districts, these habitats have been used for rough grazing and browsing by livestock. This is likely to have negatively affected recruitment success, flowering and seedset by adult plants.

The greatest current and future threat is browsing pressure by native and exotic herbivores including kangaroos, rabbits, domestic stock and, increasingly, Sambar Deer (*Rusa unicolor*). Sambar have recently become so abundant in the Upper Snowy Rainshadow district that their browsing pressure has become an existential threat to the recruitment and persistence of *Brachychiton populneus* (Kurrajong), suggesting that similar pressure may pose an existential threat also to *Senna aciphylla*.

The taxon is well adapted to pre-European settlement fire regimes. Fuel accumulation rates in the habitat range of the taxon preclude the likelihood of repeat fire at intervals approaching its tolerable fire interval. Increasing fire frequency may threaten seed-based recruitment.

The combination of increasing herbivore pressure, increasing frequency of extreme and prolonged drought and the demonstrable increase in the frequency of extreme fire events, poses an existential threat to the persistence of the taxon. Likely effects on the taxon are recruitment failure leading to seedbank depletion, exhaustion and local extinction. Extreme and prolonged drought stress may also result in adult mortality.

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> <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 A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 30 to 80% (midpoint 50%), based on (c) and (e) above.

Future decline cannot be estimated with confidence since the identified threats operate stochastically and with unpredictable intensity.

Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 240 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 90% (midpoint 60%), based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

As stated above, historic decline to agriculture is probably minor. Future decline cannot be estimated with confidence since the identified threats operate stochastically and with unpredictable intensity.

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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 136 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales, with geographically discrete occurrences at distances exceeding the dispersal range of the taxon. It has no specialised mechanism for long-distance dispersal. The only plausible vectors are ants (myrmecochory), which disperse seeds at the scale of metres, or birds, which may consume ripe pods or seeds and disperse these at a scale of kilometres.

It is estimated to have one location. It has a continuing decline in (iii) and (v) above, based on the current and projected impact of the identified threats.

Senna aciphylla

Sprawling Cassia

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

Berg, R.Y. (1975). Myrmecochorous plants in Australia and their dispersal by ants. *Australian Journal of Botany* 23: 475-508.

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



Senna aciphylla Sprawling Cassia

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Senna aciphylla*. Retrieved from:
<https://vicflora.rbg.vic.gov.au/flora/taxon/182acdd5-3bc6-4e0f-a40c-bacfb757564c>