Threatened Species Assessment

Stylidium soboliferum
Grampians Triggerplant

Taxonomy

Stylidium soboliferum F. Muell.

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criteria A3ce+4ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a perennial, often colonial herb, 5–20 cm high. Leaves densely rosetted at base, narrowly oblanceolate, 1–2 cm long, c. 1 mm wide, incurved and closely packed to form a basin, each often tipped with a long hair. Scape 7–15 cm high, glandular-hairy; flowers in a loose corymb or corymbose panicle. Calyx ovoid, c. 1 mm long, glandular-hairy, lobes equal, c. equal to tube; corolla 8–17 mm across, pale pink or white inside but reddish outside, lobes equal, broadly rounded, labellum small, blunt, with linear appendages, throat appendages absent; column c. 3 mm long; stigma cushion-like. Capsule ovoid, c. 7 mm long; seeds angular-elliptic, 0.6–0.8 mm long, brown, smooth. Flowers September–December (VicFlora 2017).

It is a moderately long-lived perennial herb; its response to fire is unknown but it is doubtless sensitive to intensive fire. Reproduction is by seed only. Recruitment continuous but pulsed after fire from a soil-stored seedbank of unknown longevity. Breeding system undocumented but very likely to be an obligate outcrosser. Pollination by insects, particularly solitary bees, hover flies and butterflies. Seed dispersal short distance only, seeds being passively shed from capsules.

Generation Length

The generation length of *Stylidium soboliferum* is suspected to be 10 to 25 years. This is based on the taxon's longevity and continuous recruitment.

Distribution

The taxon is endemic in the Grampians, Victoria, where it is widespread.

Habitat

The taxon occurs in heathy woodland on sandy soils derived from Siluro-Devonian sandstones; soils are often shallow over rock outcrops; sites are invariably rocky.

Threats

Threats to the taxon include climate change (decreased rainfall, increased evaporation, extreme temperatures); extreme rainfall events (1 in 100 year floods) causing flash floods, soil erosion, and/or severe scouring of riparian environments; soil loss on bare post-fire substrates resulting from severe rainfall events; increased frequency and

intensity of fires; inappropriate timing of prescribed fire (winter and spring); elevated fuel loads of alien plants (*Acacia longifolia* s.l. especially) causing sterilisation of soils and destruction of seedbanks; and weed invasion (especially *A.longifolia* s.l).

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 A3 as Endangered

The population reduction over the next 30 to 75 years is projected to be 50%, based on (c) and (e) above.

Future reduction of the taxon's population is based on the projected impacts of the threats operating, especially climate change, fire regimes and weed invasion and is expected to be at least 50%.

Eligible under Criterion A4 as Endangered

The population reduction over any 30 to 75 year period, including both past and future, is estimated to be 50%, based on (c) and (e) above.

Past reduction of the taxon's population is based on threats operating historically in the last 3-4 decades, i.e. extreme and very widespread fire, severe and prolonged drought, and wee invasion. Future reduction of the taxon's population is based on the projected impacts of the identified threats.

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:

Eligible under Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 2,311 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

Considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them, the individuals can be considered to be severely fragmented.

It is inferred to have 1 location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, due to the identified threats, especially climate change, altered fire regimes and weed invasion.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 236 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VNBA. As above, it is severely fragmented, has 1 location and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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. No reliable estimate of the total population size for the taxon is available.

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:

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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