Threatened Species Assessment

Spyridium daltonii
Grampians Spyridium

Taxonomy

Spyridium daltonii (F. Muell.) Kellermann

Prior to 2006, the taxon was regarded as the only Victorian species of *Trymalium,* a genus of 14 species, mostly in south-west Western Australia. It hybridises with *Spyridium parvifolium* in areas where the two putative parents are sympatric, to produce the sterile hybrid *Spyridium* X *ramosissimum*.

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 A4ce; B1ab(iii,v)+2ab(iii,v)

Species Information

Description and Life History

The taxon is a shrub, 0.8-3 m high; branchlets stellate-pubescent. Leaves linear to narrow-elliptic, 6-10(-15) mm long, c. 1 mm wide, sharply pointed, margin revolute, sometimes obscuring lower lamina, upper surface glabrous, granular, lower surface stellate-pubescent, with appressed, sometimes rusty simple hairs over midvein; stipules 1-3 mm long, persistent. Inflorescences few-flowered, terminal and upper-axillary, to c. 1 cm diam.; bracts persistent. Flowers sessile or subsessile, externally grey-pubescent with dense, mixed stellate and simple hairs, yellowish on inner surfaces; hypanthium c. 0.5 mm long; sepals 1-1.4 mm long; petals c. 0.7 mm long; disc 5-lobed; ovary summit stellate-pubescent, style very shortly lobed. Fruit c. 3 mm long; mericarps finely corrugated on inner face. The taxon flowers from August to October (VicFlora 2017).

Generation Length

The generation length of *Spyridium daltonii* is estimated to be 35 to 60 years. This is based on a longevity plausibly of 30-45 years, and an inferred reliance on episodic post-fire recruitment from a long-persistent soil-stored seedbank at plausible pre-settlement intervals of 45-75 years. The taxon is inferred, from related taxa, to be a fire-sensitive obligate seed regenerator. It recruits predominantly post-fire, but with some contribution from opportunist recruitment in response to localised site disturbance events.

Distribution

The taxon is endemic to the central areas of the Grampians (e.g. Fyans Creek, Wallaby Rocks, Mt William, Victoria Range), within the Grampians National Park in western Victoria (VicFlora 2017).

Habitat

The taxon is locally common in heathy woodlands and moist forests (VicFlora 2017). Limited quadrat data suggests that the it is commonly associated with *Eucalyptus baxteri* (Brown Stringybark), *E. obliqua* (Messmate Stringybark), *E. alaticaulis* (Grampians Grey-gum), *E. cypellocarpa* (Mountain Grey-gum) and *E. goniocalyx* (Bundy). The taxon is typically of low population density at the quadrat scale.

Threats

The taxon is threatened by the increasing risk of repeat fire events at intervals below the tolerable fire interval for the taxon. This is in response to planned burning and the increasing frequency, intensity and scale of uncontrolled bushfire. Such events threaten all stands with adult mortality, recruitment failure and seedbank depletion and exhaustion.

The taxon is further threatened by climatic drying and warming. This threat exacerbates the impact of fires, increases the incidence of lightning strike and uncontrolled bushfire, and increases the frequency and intensity of extreme drought events. Such events threaten all stands with adult mortality and recruitment failure.

it is also threatened by the impact of native and exotic herbivores, particularly deer and goats. These herbivores threaten all stands with adult mortality, reduced seed production and recruitment failure, during the vulnerable early stages of post-fire seed recruitment.

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 Vulnerable

The population reduction over the next 100 years is projected to be 25 to 45%, based on (c) and (e) above.

Future decline is based on the projected impacts of imposed fire regimes, climatic warming and drying, the projected increase in frequency of extreme drought events, and the potential impact of native and exotic herbivores.

Eligible under Criterion A4 as Endangered

The population reduction over any 105 to 180 year period, including both past and future (up to 100 years in the future), is estimated to be 25 to 55% (midpoint 45%), based on (c) and (e) above.

Past decline is based on the early impacts of imposed fire regime and climatic warming and drying. Future decline is based on 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 505 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the landscape scale. Geographically isolated stands occur at separations typically exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. This precludes the possibility of recolonisation in the event of local extinction

It is estimated to have 1 location. It has a continuing decline in (iii) and (v) above, based on the projected impacts of the identified threats, at least on stand density, and therefore population size of individual occurrences.

The taxon is severely fragmented.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 92 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 1 location and has a continuing decline in (iii) 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.

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

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Spyridium daltonii*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/7ad45011-9d8d-4678-bbb0-3ac44b6e9170