



Asplenium aethiopicum Shredded Spleenwort

Taxonomy

Asplenium aethiopicum (Burm. f.) Bech.

Rhizome usually short and erect, covered with lanceolate, brown scales. Fronds clustered, erect, 10-60 cm long. Stipe shorter or longer than lamina, grooved, brittle, dark brown, shiny; scales similar to those of rhizome. Lamina narrowly triangular-oblong, 2-pinnate with pinnae further lobed or divided (sometimes almost 3-pinnate at base); scales numerous on young lamina, more common on rachises and veins, small, dark, with long hair-tips and broad bases; primary rachis grooved, dark. Pinnae stalked, asymmetrically ovate to triangular, c. 8-20 mm long, pinnately divided, thickened basal edge decurrent on raised edge of rachis; pinnules wedge-shaped, outer edge with narrow teeth or lobes, sometimes deeply divided; veins forking, close together, raised on upper surface. Sori linear, along veins; indusium linear-oblong, membranous.

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria C2a(i)

Species Information

Description and Life History

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Generation Length

The generation length of *Asplenium aethiopicum* is estimated to be 4 to 25 years. This is a medium size fern (15 to 60 cm tall) that may be expected to reach maturity in around 4 years. Larger *Asplenium* species are known to reach 40 years in cultivation (Dyer 2013). However, drought and fire is expected to kill most individuals before they may get to this size and so a generation of 4 to 25 years is given.

Distribution

The taxon is only found on sandstone rocks in the Victoria Range, Grampians, and on basalt in collapsed lava tunnels near Darlots Creek in the south-west of the State. It is also found in WA, NSW. Southern and tropical Africa, tropical America and Asia.

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Habitat

The taxon occurs in entrances of basalt lava tunnels and in sandstone crevices in gorges near fast flowing creek in sclerophyll forest.

Threats

Beaglehole suggested that more than one clump of the plants occurred in the Cultivation Gorge and Deep Creek sites in the past, whereas more recent collections at these sites have only cited one clump, suggesting that the species may have been more numerous at these sites in the past. The descriptions in Victorian Naturalist for the other sites seems as if there could have been 40 to 100 plants in the Fitzroy River/Darlots Creek and 25 to 75 at the other Darlots Creek site.

Learmonth (1949) noted that quarrying of basalt to create a breakwater for Portland posed a risk for this fern as it was restricted to basalt in the Portland area. Some plants of the taxon are reserved within Tyrendarra Nature Conservation Reserve, and it is uncertain how much of an impact any extraction of basalt had on this species. Learmonth (1949) also noted that several dead plants were seen, and that he attributed that to the insufficient moisture due to exceptionally dry winters. All Grampians populations reside within the area burnt by the 2013 fires of the Victoria Range and Valley.

Climate-changed induced drought and increased fire frequency and are likely to be the most significant future threats.

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 12 to 75 years is estimated to be 25 to 55%, based on (a) and (c) above.

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This is based on past surveys by Beauglehole, Ohlsen and others suggesting numerical declines. The Deep Creek Gorge population in the Grampians was not found in 2010.

Eligible under Criterion A4 as Endangered

The population reduction over any 12 to 75 year period, including both past and future, is estimated to be 26 to 65%, based on (a) and (c) above.

It is likely that fires and drought will occur in the future cause future population decline.

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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 971 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented, as all populations are potentially small and are isolated from each other by several kilometres and are in separate gorges or catchments.,

It is estimated to have 1 location. All Grampians sites where this species has been found are considered as a single location. This is supported by the 2013 fire that affected the area around all three sites demonstrating that a single event can affect all these subpopulations. Three collecting sites are associated or close to Darlot's Creek and are considered the one location.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above due to the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 24 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 2 locations and has a continuing decline in (i), (ii), (iii), (iv) 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:

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 35 to 221 mature individuals. The minimum estimate assumes that the Grampians populations are now extinct, while the upper estimate assumes that all known Grampians populations persist with around 15 plants each (as noted by D. Ohlsen in 2010 at Cultivation Creek).

The number of mature individuals is estimated to continue to decline and the number of mature individuals in each subpopulation is 50 or fewer.

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 D as Endangered

The taxon is estimated to have 35 to 221 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

Beaglehole A.C. and Learmonth N.F. (1957). The Byaduk Caves. *Victorian Naturalist* 73:204-210.



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

Dyer, A. (2013). What is the natural life-span of a fern? *Pteridologist* 5.6. 460-464.

Learmonth N.F. (1949). Rediscovery of a long-lost fern. The forked spleenwort (*Asplenium praemorsum*). *Victorian Naturalist* 66: 129-131.

Learmonth N.F. (1951). More forked spleenwort. *Victorian Naturalist* 67: 224.

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Asplenium aethiopicum*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/00c41030-8983-4126-8b57-2a32fe559089>