



Huperzia australiana Fir Clubmoss

Taxonomy

Huperzia australiana (Herter) Holub

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(ii,iii,iv,v); D

Species Information

Description and Life History

Stems leafy throughout, rooted at base only, erect or partly decumbent, undivided or branching 1-3 times, 8-20 cm long. Leaves spirally arranged, crowded, overlapping and ascending, narrowly lanceolate, 6-9 cm long, more than 1 mm wide, mid-green, or sometimes yellowish; base shortly decurrent; apex acute to shortly acuminate. Sporophylls scattered along branch, not restricted to defined zones (but more common towards apex), similar in size and shape to vegetative leaves. Small lateral buds (bulbils) often present in plants from well-lit habitats.

Generation Length

The generation length of *Huperzia australiana* is estimated to be 5 to 35 years. *Huperzia* spp. grown in cultivation have become fertile in five years, and this is therefore given as a minimum value for generation length. They are also known to survive for decades as cultivated plants.

Distribution

The taxon is restricted to alpine or subalpine scrubs or wet heathlands. (e.g. Baw Baws, Mt Buller, Snowy Range, Bogong High Plains, Nunniong Plateau).

Habitat

The taxon occurs in alpine or subalpine scrubs or wet heathlands.

Threats

The taxon and its habitat are threatened by increase in fire frequency/intensity, cattle grazing, climate change and severe weather such as drought, storms and flooding.

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;"><i>based on any of the following:</i></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 15 to 100 years is projected to be 25 to 50%, based on (c) and (e) above.

With threats such as fire and dry periods likely to occur in the future, it is possible that some decline may occur. This is especially likely with subpopulations in drier sites might be more vulnerable to fire and drought.

Eligible under Criterion A4 as Endangered

The population reduction over any 15 to 300 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 50%, based on (c) and (e) above.

Past decline is based on damage from threatening processes such as cattle grazing, drought and fire. factors, most notably the Bogong High Plains. Around 25 subpopulations occur on the Bogong High Plains which would have been particularly exposed to these 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 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 148 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

There are at least five to seven locations: Mt Bullfight; Mt Buller and the Snowy Range area; the Baw Baw Plateau; the Bogong High Plains; and the Cobberas and Nuniong Plateau. The additional two localities would be if the Buller and Cobberas/Nuniong locations are each divided into two due to their large geographic spread. At least five locations are designated because they are disjunct and separated by areas of unsuitable habitat and it is likely that a single threatening event would not affect each of the five locations in the same way.

It is estimated to have a continuing decline in (iii) 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

It is estimated that there are 90 to 350 mature individuals, but other thresholds under this criterion have not been met.

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 90 to 350 mature individuals. This species is generally in low numbers when found. Some records report only a single plant being noted. Other reports suggest a few plants being seen or rare. There are no reports of this species being abundant or common. Consequently, an average of 3 to 5 plants per subpopulation is estimated which when multiplied with 60 to 70 subpopulations results in a possible range of 90 to 350 mature individuals.



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

References