



Hakea lissosperma Mountain Needlewood

Taxonomy

Hakea lissosperma R. Br.

This is a species variable in habit, leaf thickness and flexibility and rarely, hair covering. Much of this variability seems related to habitat and exposure. An isolated occurrence of a single plant of *Hakea lissosperma* from near Goongerah, East Gippsland, was previously referred to *H. macraeana*. This plant is atypical in its weeping habit and narrow, flexible leaves, and in its dry forest habitat at the relatively low altitude of 700 m. It is distinguished from *H. macraeana* by the absence of a groove on the lower leaf surface (VicFlora, 2018).

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criteria A3bce+4bce; B1ab(ii,iii,v)+2ab(ii,iii,v); D2

Species Information

Description and Life History

The taxon is usually a narrowly pyramidal shrub 1-5 m high; branchlets appressed shining-pubescent when young. Leaves narrowly to widely spreading, terete, 5-8(-13) cm long, 1.1-1.6 mm wide, not grooved, appressed shining-pubescent when young; apex straight. Inflorescence 6-8-flowered; rachis knob-like, densely white-tomentose; pedicel 3.5-5.5 mm long, with appressed white hairs; perianth 3.5-6 mm long, white or cream, sometimes sparsely pubescent; pistil 8-10.5 mm long; pollen presenter an oblique disc. Fruit obliquely ellipsoid, 2.3-2.7 cm long, 1.7-2 cm wide, coarsely rugose or tuberculate; beak transverse; horns obscure; seed not occupying whole valve face, 15-16.5 mm long, 6-7 mm broad; wing only partly down one side of seed-body, black or dark brown. The taxon flowers mostly from October to December (VicFlora, 2018).

Generation Length

The generation length of *Hakea lissosperma* is suspected to be 30 to 50 years. Based on the size it can reach (to 6 metres), the taxon is clearly long-lived. According to the Flora of Victoria (2018), it is not a suckering plant. Seed is held on the plant for several seasons and apparently takes about 6 months to germinate following sowing. On conjunction with consideration of its habitat, it would not appear to be fire dependant, but instead be maintained by minor disturbances.

Distribution

The taxon is scattered in high-subalpine to alpine areas (e.g., Mt Buffalo, Snowy Range, Mt Hotham area, the Cobberas), but locally common (VicFlora, 2018).

Habitat

The taxon occurs in rocky areas at high elevations (VicFlora, 2018).

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Threats

Potential threats to the taxon include climate change (i.e., decreased rainfall), increased frequency and intensity of fire, repeat fires, drought stress, failed recruitment/reproduction due to drought conditions, weed invasion, browsing by feral animals (i.e., deer, rabbits) and domestic stock.

The bushfires of 2019/2020 are believed to have impacted around 13% of the taxon's modelled habitat, as of early January 2020. The overall impacts of the fire are yet to be determined. The taxon is likely to be threatened by feral herbivores, notably Sambar Deer. Drought, hot weather and repeat fires have the potential to damage or destroy recovering plants and/or seedlings.

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 A3 as Vulnerable

The population reduction over the next 90 to 100 years is projected to be 30 to 50% (midpoint 40%), based on (b), (c) and (e) above.

The taxon is very likely to decline as a result of repeat fires and drought stress.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is suspected to be 30 to 50% (midpoint 40%), based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline is based on likely land clearing for ski resorts and the impacts of feral herbivores and the 2019/20 fires. Future decline is based on the identified threats, notably repeat fires and drought stress.

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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 and B2 as Vulnerable

The Extent of Occurrence across the taxon's range is estimated to be 12,732 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) across the taxon's range is estimated to be 154 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is estimated to have nine locations. The threat of fire applies across the broad range of the taxon, however this may be somewhat less of a risk at alpine elevations (e.g., Mt Hotham) compared to sub-alpine and apparently more fire-prone localities, such as Mt Buffalo.

It has a continuing decline in (ii), (iii) and (v) above. as result of the impacts of increased frequency and intensity of fire, repeat fires and drought stress. Impacts of deer and feral horses may also contribute to decline.

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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 as Data Deficient

Relevant population data for the taxon are unavailable. There may be hundreds, possibly thousands 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 suspected 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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