

## *Australopyrum retrofractum* Comb Wheat-grass

### Taxonomy

*Australopyrum retrofractum* (Vickery) A. Love

### 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 B1ab(v)+2ab(v)

### Species Information

#### Description and Life History

The taxon is a slender, tufted or shortly rhizomatous perennial. Culms mostly glabrous, shortly pubescent for 1-3 cm below the inflorescence, erect, to 1.2 m high. Leaves glabrous to sparsely hairy; blades erect, flat, 6-15 long and 1-5 mm wide; sheath smooth and shining; ligule truncate, less than 0.5 mm long; auricles pointed, encircling stem, sometimes overlapping. Inflorescence compact to rather sparse, 2-10 cm long, of 4-18 spikelets, the rachis flattened, covered with short antrorse or retrorse hairs. Spikelets 4-9-flowered, rigid, 7-18 mm long, soon disarticulating; glumes subequal, 6-8 mm long, narrowly tapered to an awn-like apex, indistinctly 3-7-nerved, virtually smooth, widely gaping or reflexed at maturity; lemma broader, slightly longer and firmer than glumes, indistinctly nerved, scabrous along dorsal angle; palea about equal to body of lemma. The taxon flowers from September to November (VicFlora 2019).

#### Generation Length

The generation length of *Australopyrum retrofractum* is estimated to be 10 to 20 years. This is based on an estimated longevity of 10-20 years, and the likelihood that the taxon resprouts from the rhizome following most fire events and browsing impacts. The taxon is likely to recruit episodically post-fire, and sporadically and opportunistically in response to localised site disturbance events and seasonal conditions.

#### Distribution

The taxon is mostly found in areas of the Snowy River and its tributaries (e.g. Buchan and Murrindal Rivers), with outliers near Nowa Nowa and Mt Tingaringy. Additionally, the taxon is found in New South Wales and has been introduced into New Zealand (VicFlora 2019).

#### Habitat

The taxon is restricted to a few rocky, usually elevated sites in rain shadow areas (VicFlora 2019).

#### Threats

The taxon is likely to have suffered significant historic decline in some districts, through habitat loss to agriculture and habitat degradation in response to stock grazing and the proliferation of exotic weeds and herbivores such as rabbits.

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The taxon is suspected of having a low tolerance of competition and some stands may be subject to invasion by exotics, such as Blackberry (*Rubus anglocandicans* or *R. polyanthemus*). This is unlikely to be a major threat in drier rocky sites.

Current and projected increases in fire frequency may favour the taxon, by reducing competition from dominant taxa at risk of recruitment failure. Climatic drying is also likely to reduce competition from highly competitive sympatric taxa.

Sambar may pose a threat in some sites, but this is likely to be a minor threat in dry, rocky sites where the taxon is likely to tolerate moderate herbivore pressure.

In the longer term, however, the impact of extreme drought stress may result in adult mortality, recruitment failure and seedbank depletion, ultimately resulting in local extinction.

### 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> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

### Evidence:

#### Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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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 <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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 3,442 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is severely fragmented naturally at the subregional scale. The taxon is also severely fragmented anthropogenically at the landscape scale in some districts, which have been largely cleared for agriculture. It is less clear whether the taxon is severely fragmented naturally at the landscape scale, since seed is likely to be dispersed by bird and mammal vectors at the 10 m to kilometre scale.

It is estimated to have 1 location. It has a continuing decline in (v) above.

#### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 115 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has one location, and has a continuing decline in (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:

### Ineligible under Criterion C as Data Deficient

There is insufficient evidence to determine the number 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 <sup>2</sup> 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](https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Australopyrum retrofractum*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/05dca141-23f4-4ad9-8579-4dba81cd952f>