

Threatened Species Assessment

Rytidosperma australe Southern Sheep-grass

Taxonomy

Rytidosperma australe (Petrie) Clayton & Renvoize ex Connor & Edgar

Occasional specimens of other *Rytidosperma* species (notably *R. oreophilum* and *R. caespitosum*) occurring in similar exposed sites may resemble *R. alpicola* in the compact growth habit and stiff foliage and care is needed to correctly identify these plants (VicFlora 2018).

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a rhizomatous perennial, typically forming a close turf, culms to 8 cm high; leaves smooth and glabrous; blade rather stiff, closely folded or inrolled, 1-3 cm long and c. 0.5 mm wide; sheath often tinged purple; ligule ciliate, c. 0.3 mm long; inflorescence a raceme of 2-5 spikelets, to 1.5 cm long. Spikelets 2-3-flowered, 2.5-3.5 mm long; glumes purplish, ovate, obtuse, 2.5-3.5 mm long; lemma glabrous, ovate, c. 2 mm long, obtuse or emarginate at apex with a minute awn to 0.2 mm long within the notch; palea narrowly obovate, slightly shorter than lemma. The taxon flowers from January to February (VicFlora 2017).

Generation Length

The generation length of *Rytidosperma australe* is estimated to be 50 to 100 years. The taxon is a rhizomatous perennial, typically forming a close turf. Longevity is therefore potentially indefinite with the age of each clone limited only by stochastic events such as landslip or erosion of the gravelly substrate by unseasonal storm or flood events. Recruitment is likely to be opportunistic and promoted by rare and localised disturbance events.

Distribution

The taxon is very rare, known in Victoria only from the Bogong High Plains, near Mt Cope. The taxon also occurs in New South Wales and Tasmania (VicFlora 2017).

The taxon is reliably recorded from only three sites in Victoria: two adjacent gullies in the headwaters of Middle Creek, south of Cope Hut, and Cope Creek, north of Mt Cope. The two small adjacent headwater gullies south of Cope Hut are known as New Species Gully and Sister Species Gully and are separated by less than a kilometre. All three sites are well within 2 km of each other.

Habitat

The taxon is known only from broad, wet, gravelly creek beds and margins (VicFlora 2017). In 1954, Stella Carr (nee Maisie Fawcett) recorded it growing in islands of flat peaty soil in broad eroded creek beds of east aspect in the third small valley south of Cope Hut. In 1981, Harm van Rees described the habitat on Cope Creek, north of Mt

Rytidosperma australe

Southern Sheep-grass

Cope, as an open wet area where often forming a sward spreading with rhizomes. Dominant species include *Oreobolus pumilio* and *Deschampsia caespitosa*.

In 2018, Berto recorded the taxon in *Caltha* (now *Psychrophila*) herbland, where associated with *Carex gaudichaudiana* and *Sphagnum cristatum*, approximately 350 m east-north-east of where the Australian Alps Walking Track crosses Cope Creek.

Threats

The taxon is likely to have suffered significant historic decline as a consequence of habitat degradation by stock prior to the cancellation of alpine grazing licences throughout the Alpine National Park. Cattle degraded the habitat by browsing palatable vegetation, trampling and pugging bogs, initiating erosion of fragile gravelly substrates of *Caltha* herblands and causing eutrophication from their faeces, resulting in exotic weed invasion.

Whilst the habitat and the taxon may have partially recovered following grazing exclusion, the impact of exotic herbivores on alpine bogs and other wetlands has continued with the increase in density of feral horses and, most recently, the explosive increase in Sambar Deer density across the Bogong High Plains. Sambar have been observed to browse on *Psychrophila introloba* and their pugging, rutting and wallowing now pose an existential threat to the fragile *Caltha* (*Psychrophila*) herbland community with which *Rytidosperma australe* is uniquely associated.

In the longer term, the fragile wetland habitat of the taxon is threatened by climatic drying and warming causing a decline in snow melt which feeds the headwater gullies and streams supporting the only Victorian occurrences of the taxon.

The taxon is also threatened by the increasing frequency and intensity of fire which, in concert with climatic drying, increases the risk of competition from shrubs encroaching on wetland margins.

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 Critically Endangered

The population reduction over the next 100 years is projected to be 50 to 100% (midpoint 80%), based on (c) and (e) above.

Although the magnitude of future decline cannot be estimated with any significant confidence since the identified threats operate incrementally or stochastically and with unpredictable intensity, there is a significant risk that the taxon will become locally extinct in Victoria within the coming decades.

Eligible under Criterion A4 as Endangered

The population reduction over any 150 to 300 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 90% (midpoint 65%), based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline cannot be estimated with any confidence since there is insufficient monitoring data to indicate whether the taxon recovered following cancellation of alpine grazing licences and whether the taxon has declined further in recent years with the explosive increase in Sambar population density across the Bogong High Plains.

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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to be severely fragmented naturally at the landscape scale, with all known occurrences separated by distances likely to exceed the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal.

It is estimated to have one location, based on the impact of the identified threats which are expected to operate uniformly across the exceedingly restricted Victorian range of the taxon. If one or more occurrences are securely fenced to exclude Sambar Deer and feral horses, a second location could be identified although the protected occurrences would be conservation dependent and their security dependent on constant vigilance and maintenance.

Rytidosperma australe

Southern Sheep-grass

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is estimated to be severely fragmented, is estimated to have 1 location and has a continuing decline in (i), (ii), (iii), (iv) 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 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 estimated to be very restricted.

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



Rytidosperma australe Southern Sheep-grass

References

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

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Rytidosperma australe*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/ce4ee5a2-9597-473c-96b0-f94de3e0ec97>