Threatened Species Assessment

Rhytidosporum inconspicuum
Alpine Marianth

Taxonomy

Rhytidosporum inconspicuum L.W. Cayzer, Crisp & I. Telford

Very close to *R. procumbens*, best distinguished by its generally smaller size and, particularly, the ripe seeds (VicFlora 2015).

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 A2ce+3ce+4ce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a prostrate, often mat-forming subshrub, to c. 30 cm diameter; young stems glabrous or finely pubescent. Leaves subsessile, obovate, 3-8 mm long, 1.5-3.5 mm wide, acute, entire or rarely obscurely toothed near apex, margins sometimes minutely ciliate, usually scabrous, elsewhere smooth and glabrous; margins plane or slightly recurved. Flowers solitary in upper axils; pedicel 1-4 mm long, elongating to c. 8 mm long in fruit, deflexing or remaining more or less straight; sepals lanceolate, 1.5-3 mm long, often purplish; petals free, elliptic, 4-5 mm long, white or pinkish; stamens slightly shorter than petals. Capsule as for R. procumbens; seeds elliptic, c. 2 mm long, brown, not or hardly wrinkled (Vicflora 2015).

Cayzer *et al*. (1999) describe the taxon as an inconspicuous, rhizomatous shrub with aerial shoots less than 10 cm high, procumbent up to 50 cm long, subterranean shoots extensive, new aerial shoots slightly corrugated, angular, sparsely hairy, glabrescent. They also note that peak flowering is in early summer in Victoria and about 6 weeks earlier in NSW.

Generation Length

The generation length of *Rhytidosporum inconspicuum* is estimated to be 30 to 100 (midpoint 50) years. Cayzer *et al*. (1999) distinguish the taxon, along with another alpine species in NSW and the ACT, *R. alpinum*, from the remaining three congeners by its extensively rhizomatous habit. Despite its low stature and inconspicuous growth habit through surrounding vegetation, longevity is therefore potentially indefinite, limited only by excavation by animals, erosion of the substrate by floodwaters, natural senescence or, potentially, drought or disease-induced mortality. The taxon is inferred to be a resprouter, surviving fire unless fire intensity is so extreme and the substrate so dry that it consumes the highly organic peat and destroys the entire rhizome system. Given fire occurred historically perhaps once or twice a century, generation time is likely to be at least 50-100 years or more unless the clonal genet senesces between recruitment events. Recruitment is likely to be a rare event, either episodic following very infrequent fire events or opportunistic in response to localised site disturbance events which remove the intense competition from *Empodisma minus* (Spreading Rope-rush) or *Poa costiniana* (Bog Snow-grass).

Distribution

The taxon is apparently uncommon in Victoria where it is recorded from the Snowy Range north of Licola, Mt Useful, Mt Buffalo, Nunniong Plateau and the Bogong High Plains. In 1860 Ferdinand von Mueller collected the taxon at Mt Baw Baw but it has not been confirmed on the Baw Baw Plateau since and may have become extinct at this site. It also occurs in NSW and Tasmania (VicFlora 2015).

Habitat

The taxon occurs in damp alpine or subalpine grassland or heathland (VicFlora 2015). Cayzer *et al*. (1999) suggest the taxon is quite common in subalpine heath and *Eucalyptus pauciflora* (Snow Gum) woodland above a tussock grassland understorey and suggest that some substrates are acidic clay-loam over metamorphic rock in Victoria.

Limited quadrat data at Mt Buffalo indicates that the habitat of the taxon is dominated by *Baeckea gunniana* (Alpine Baeckea), *Empodisma minus* (Spreading Rope-rush), *Epacris gunnii* (Ace of Spades), *Grevillea australis* (Alpine Rope-rush), *Poa costiniana* (Bog Snow-grass) and *Sphagnum cristatum* (Peat Moss) suggesting the taxon occurs in peaty wet heath fringing alpine bogs and swamps. *Empodisma minus* is sometimes the outright dominant of these wet habitats and in all available quadrats *Rhytidosporum inconspicuum* is recorded with negligible projective foliage cover (less than 1%) at the quadrat scale. This suggests the taxon is consistently rare and of low density.

Specimen data indicates that at Mt Useful and several sites in the Snowy Range and on the Nunniong Plateau the taxon extends to elevated, grassy or heathy woodland habitats dominated by *Eucalyptus pauciflora* (Snow Gum), *E. kybeanensis* (Mallee Ash) or *E. dalrympleana* (Mountain Gum).

Threats

The taxon is likely to have suffered significant historic decline through trampling and pugging of at least a proportion of its habitat by cattle, feral horses and, increasingly, by Sambar Deer. The taxon is unlikely to have been directly targeted for browsing on account of its lowly stature and inconspicuous habit, but it may have been browsed incidentally. The wet habitat of the taxon in Victoria makes it vulnerable to ongoing loss of habitat through trampling, pugging and wallowing by feral horses on the Bogong High Plains and the Nunniong Plateau and by Sambar across its range. Cattle no longer graze within the Alpine or Mt Buffalo National Parks although grazing licences are still current on the Nunniong Plateau. Increasing impacts of feral horses and Sambar across most of its range might be countered to a slight extent in some areas by recovery from cattle grazing but this is likely to be short-lived given the current explosion in Sambar and feral horse numbers across the alpine region. Many stands of the taxon and its habitat are threatened by site-specific disturbances and weed invasion and all occurrences are threatened by climatic warming and drying and consequent increases in frequency, intensity and landscape scale of fire.

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 A2 as Endangered

The population reduction over the past 90 to 300 years is estimated to be 30 to 80 (midpoint 50)%, based on (c) and (e) above.

The taxon is inferred to have suffered significant historic decline through trampling and pugging by cattle and feral horses and, increasingly, by pugging and wallowing within wetland and bog habitats by Sambar. The full impact of cattle grazing may have been partially reduced by the cancellation of grazing licences within the Alpine National Park, but this short-term benefit may have already been overtaken by the increasing population densities of Sambar and feral horses throughout the alpine region.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 30 to 80 (midpoint 50)%, based on (c) and (e) above.

Future decline cannot be estimated with confidence since the identified threats operate incrementally or stochastically and with unpredictable intensity.

Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 300 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 90 (midpoint 60)%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

The taxon is inferred to have suffered significant historic decline through trampling and pugging by cattle and feral horses and, increasingly, by pugging and wallowing within wetland and bog habitats by Sambar. The full impact of cattle grazing may have been partially reduced by the cancellation of grazing licences within the Alpine National Park but this short-term benefit may have already been overtaken by the increasing population densities of Sambar and feral horses throughout the alpine region.

Future decline cannot be estimated with confidence since the identified threats operate incrementally or stochastically and with unpredictable intensity.

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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 60 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the subregional and landscape scales with geographically discrete occurrences at separations exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. The only plausible vectors are ants (myrmecochory), which operate at the metre scale, or small mammals, which operate at the 100-1000 m scale. It is unclear whether the fruit or seed are likely to be predated by birds as occurs for other members of the Pittosporaceae

It is estimated to have 2 locations. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats.

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. There is no available estimate of population size for the taxon in Victoria. The taxon was only described taxonomically in 1999 and remains poorly known with no population monitoring to date.

Criterion D. Very small or restricted population			
	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 km2 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

Cayzer, LW, Crisp, MD and Telford, IRH (1999) Revision of *Rhytidosporum* (Pittosporaceae). Australian Systematic Botany **12**: 689-708.

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

VicFlora (2015) Flora of Victoria, Royal Botanic Gardens Victoria: *Rhytidosporum inconspicuum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/56d05501-1c69-47ee-ae32-f7a17f3ae989