

Abutilon oxycarpum var. *subsagittatum* Flannel Weed

Taxonomy

Abutilon oxycarpum var. *subsagittatum* Domin

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2003).

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

Proposed conservation status

Critically Endangered in Victoria

Criterion B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

Spindly erect perennial shrub to 1 m high; branchlets densely tomentose with glandular hairs and occasional sessile stellate hairs and long simple hairs. Leaves narrowly to broadly ovate, 2-9 cm long, c. 1 cm wide, ± concolourous, pubescent on both surfaces; base cordate to sagittate; margins crenate; apex acute. Flowers solitary; calyx obscurely 5-ribbed, campanulate, 4-6 mm long; lobes shortly acuminate, lined along midline; corolla yellow, exceeding calyx; lobes 3.8-6 mm long, asymmetrically rounded apically; staminal column c. 1.5 mm long, glabrous; styles 5-8. Fruit campanulate, 6-10 mm high (including awns), tomentose with stellate and simple glandular hairs, with occasional longer hairs along sutures, adjacent mericarps adhering for more than half their length, spreading widely from each other but remaining attached basally; mericarps 3-seeded, 6 mm high, 2.5 mm wide, with an apical awn 1.5-3 mm long, pointing outwards (VicFlora 2018).

Generation Length

The generation length of *Abutilon oxycarpum* var. *subsagittatum* is inferred to be 5 to 75 years. Although longevity is plausibly in the 5-15 year range, recruitment is likely to be both episodic following fire at estimated pre-settlement intervals of 50-75 years or more, and opportunistic in response to optimal seasons and localised site disturbance events such as animal activity. Whilst lower and upper bound estimates of generation length are 5 and 75 years respectively, most plausible generation lengths are likely to be in the 15-50 year range. The taxon is inferred to be an obligate seed regenerator with negligible capacity to resprout, recruiting from long-persistent soil-stored seedbanks. This is supported by the observation that no adult plants were observed by Dale Tonkinson in September 2003, despite a targeted search, suggesting that all plants observed by James Turner in 1990 or by John Eichler (pers. comm.) had senesced or succumbed to drought stress or targeted herbivory.

Distribution

In Victoria the taxon is known with certainty only from a single locality south-east of Suggan Buggan in far East Gippsland: a gully about 1 km west of the Snowy River and halfway to Helipad Track, ESE of Barrabilli Mountain. The taxon also occurs in Queensland and NSW (VicFlora 2018).

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Habitat

In Victoria the taxon is known with certainty only from the *dry Eucalyptus albens/Callitris columellaris* woodlands on coarse granitic sand along the upper Snowy River. The plants grow on the floor of a small amphitheatre, in a somewhat protected rocky site, possibly a fire-shadow. The habitat is probably infrequently burnt.

In NSW the taxon is usually found on red earths with a sandy or clay loam texture, often associated with Bimble Box communities (Cunningham et. al. 1992).

Threats

At the time of discovery in 1989, the taxon was known in Victoria by a single stand of less than 20 plants with an area of occupancy of only 4 square metres (John Eichler pers. comm.). The taxon is therefore threatened principally by elimination through stochastic events. Furthermore, the Victorian occurrence is remarkably disjunct from the closest occurrences in New South Wales in the Tamworth and Cobar districts. The Victorian stand represents an isolated subpopulation at the geographic limit of the taxon's range and is therefore severely fragmented, which precludes any likelihood of recolonisation in the event of local extinction. The occurrence could not be relocated during a targeted search of the site by Dale Tonkinson in September 2003. It is unclear whether this simply reflects the relatively short longevity of the taxon or whether it reflects a long-term decline in population size or persistence of a viable seedbank. The stand may have succumbed through senescence, targeted browsing or drought stress leading up to the 2002-2003 fire season.

There is circumstantial evidence to suggest that the Victorian occurrence may be threatened by grazing pressure from rabbits, hares, macropods, stock, feral horses (brumbies) and deer. Cunningham et al. (1992) note that the variety *subsagittatum* is "known to be eaten by stock" and Browne (1986) suggests that "probably most or all" Victorian species of *Abutilon*, *Hibiscus* and *Radyera* "are palatable to grazing mammals so that their conservation may involve some grazing control." Population density of both feral horses (brumbies) and Sambar Deer (*Rusa unicolor*) have undergone spectacular explosions in recent years, suggesting these two exotic herbivores pose the greatest threat to the taxon, particularly during early stages of episodic recruitment. The taxon may be preferentially grazed by Euros and Wallabies, since related taxa in Mallee are browsed.

The single Victorian occurrence may also be at risk of elimination by fire. Although the rocky and somewhat protected nature of the habitat may act as a fire shadow, and observation of the site in September 2003 indicates the site was not burnt by the catastrophic wildfire which swept through the district in January 2003, the taxon is threatened, like any other obligate seed regenerator, by repeat fire events at intervals below or approaching the tolerable fire interval for the taxon. Recruiting stands are also at increasing risk of recruitment failure in response to extreme and protracted drought stress resulting from climatic drying and warming. The site of the only known Victorian occurrence is unlikely to have been burnt by the bushfires in January and February 2020.

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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"> (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:

Ineligible under Criterion A

There is insufficient evidence to determine a past or future reduction in population size.

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			

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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 is made equal to the AoO to comply with the expectation that the AoO is contained within the EoO.

The taxon is estimated to have 1 location, and has a continuing decline in (i), (ii), (iii), (iv) and (v). The only evidence of decline in population size is the inability of a targeted search in 2003 to relocate the stand of less than 20 individuals discovered in 1989. The single Victorian subpopulation which is subject to stochastic and other identified threats which are likely to result in a continuing decline in habitat quality.

Eligible under Criterion B2 as 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, it is estimated to have 3 locations and has a continuing decline in (i), (ii), (iii), (iv) and (v).

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

There is no information available regarding the current size of the only known Victorian subpopulation. The only estimate of population size at the time of discovery in 1989 was less than 20 individuals and these could not be relocated in 2003 despite a targeted search.

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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 km ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D 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

Browne, J.H. (1986) Members of the Malvaceae family rare in North Western Victoria. *The Victorian Naturalist* 103(5): 150-157.

Cunningham, G.M., Mulham, W.E., Milthorpe, P.L. and Leigh, J.H. (1981). *Plants of western New South Wales*. Soil Conservation Service of NSW.

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

SAC (2003). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 666 *Abutilon oxycarpum* var. *subsagittatum*.

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Abutilon oxycarpum* var. *subsagittatum*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/9a036bb8-f615-4fab-809e-9103defca55f>