



## *Abutilon malvifolium* Mallow-leaf Lantern-flower

### Taxonomy

*Abutilon malvifolium* Benth.

### 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

Criteria B1ab(ii,iii)c(iv)+2ab(ii,iii)c(iv)

### Species Information

#### Description and Life History

Prostrate annual, 10-70 cm wide; branchlets densely tomentose with glandular hairs and occasional sessile stellate hairs and long simple hairs. Leaves broadly ovate to circular, 1-4 cm long, 2-3 cm wide, often 3-5 lobed,  $\pm$  concolorous, becoming sparsely hairy above; base cordate; margins crenate; apex rounded. Flowers solitary; calyx obscurely 5-ribbed, campanulate, 5.5-10 mm long; lobes shortly acuminate, lined along midline; corolla yellow, c. equal to or 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. Flowers year-round, but chiefly summer and winter to early spring.

#### Generation Length

The generation length of *Abutilon malvifolium* is estimated to be 1 to 8 (midpoint 6) years. Although an annual, it is a transient species that can be absent from a site for at least 6 years before re-appearing (Parsons and Browne 2000). Parsons and Browne (2000) found that the major abiotic determinants of mature plant occurrence in Victoria are warm season rainfall and flooding, the former necessary for recruitment and the latter temporarily excluding the taxon by promoting dense stands of competing species. The authors also found that a minimum of 26 mm rainfall between November and March is needed for germination. Favourable rainfall may not occur for up to 8 years in the habitat of the taxon.

#### Distribution

The taxon is known in Victoria known only near Red Cliffs. It also occurs in WA, NT, SA, Qld, NSW.

#### Habitat

The taxon is only known from cracking grey clay soils of the Murray River floodplain. The climate is semi-arid, with a mean annual rainfall of 290 mm at Red Cliffs, the wettest months being from May to October. The rainfall is highly variable, especially in summer when rain usually occurs as heavy downpours during thunderstorms (Parsons and Browne 2000).

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The habitat notes provided on a collection held at MEL (Stajsic 4347) state: "Open *Eucalyptus largiflorens* woodland, with *Muehlenbeckia florulenta* and *Chenopodium nitrariaceum*, on dry, cracking, grey clay of Coonambidgal origin. Associated species: *Disphyma crassifolium* subsp. *clavellatum*, *Stelligera endecaspinis*, *Eremophila divaricata*, *Atriplex lindleyi*, *Sclerolaena diacantha*, *Sclerochlamys brachyptera*, *Atriplex leptocarpa*, *A. nitrariaceum*."

### Threats

Parsons and Browne noted that the taxon is palatable to stock and kangaroos. Although the site was fenced off from stock, the fence was not kangaroo-proof. The authors considered grazing as the most serious threat, with kangaroos preventing seed set by most plants in 1999 and some previous years. The authors considered the provision of kangaroo-proof fencing as the most important management recommendation.

Val Stajsic and John Eichler visited Bottle Bend on 4 March 2007, and plants were found outside the fenced area and subject to grazing by kangaroos.

Future climatic drying and drought stress as a result of climate change will result in less favourable rainfall events. A favourable rainfall event followed by a drought will lead to recruitment failure.

### 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:

#### Eligible under Criterion A2 as Vulnerable

The population reduction over the past 3 to 24 years is suspected to be 20 to 30%, based on (c) and (e) above.

There is no reliable information for past reductions because there have been no dedicated surveys for this taxon. However, the taxon is palatable to stock and kangaroos, and given that the area was grazed by stock until at least the mid-80's it is possible that the taxon experienced a reduction.

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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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to have 1 location. It has a continuing decline in (ii) and (iii), based on the identified threats, specifically future climatic drying and drought stress, and continued grazing by kangaroos and possibly rabbits and goats.

It has extreme fluctuations in (iv) above. The taxon is an annual species, which can be absent from a site for at least 6 years before re-appearing (Parsons & Browne 2000). It is or was subject to extreme fluctuations under pre-settlement conditions.

### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has 1 location, a continuing decline in (ii) and (iii) and extreme fluctuations in (iv) 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

The taxon has fewer than 100 mature individuals, but it is unclear whether the identified threats are currently acting with sufficient intensity to result in a continuing decline in population size.

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 D as Endangered

The taxon is estimated to have 40 to 100 mature individuals.

100 plants were counted between 1983-1984 (Parsons and Browne 2000). The last known count was on March 2007, with approximately 40 plants. Given that the taxon is an annual and dependent on favourable warm season rainfall, it is possible that currently the species might be absent from the known sites. It is a transient species which can be absent from a site for at least 6 years before re-appearing (Parsons and Browne 2000).

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



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## References

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

Parsons, R.F. and Browne, J.H. (2000). Causes of rarity in *Abutilon oxycarpum* and *Hibiscus brachysiphonius* (Malvaceae) on the River Murray floodplain, South-eastern Australia. *Transactions of the Royal Society of South Australia* 124(1):41-44.

SAC (2003). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 651 *Abutilon oxycarpum* var. *malvaefolium*

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Abutilon malvifolium*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/63f0cb43-67f9-47ce-8f19-2d01ec2de428>