Threatened Species Assessment

Xanthosia stellata
Star Xanthosia

Taxonomy

Xanthosia stellata J.M. Hart & Henwood

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The taxon is an erect or scrambling subshrub to 20 cm high; branches sparsely stellate hairy. Leaves alternate, 3-foliolate, leaflets elliptic or cuneate, c. equal, commonly 3-lobed, 2-12 mm long, 2-10 mm wide, discolorous, adaxial surface sparsely stellate-hairy, abaxial surface off-white to light green; petiole 2-10 mm long. Inflorescence of 1 or 2, 1-2-flowered umbels, sessile or pedunculate; peduncles to 12 mm long; bracts 3-4 mm long, acute, abaxial surface with sparse stellate hairs. Sepals 1.3-1.5 mm long, green; petals 1.1-1.3 mm long, white; nectary hirsute. Fruit 3-3.2 mm long, mericarps evenly ribbed. Flowers mostly Nov.-Jan., but also sporadically through the rest of the year (VicFlora 2016).

Generation Length

The generation length of *Xanthosia stellata* is estimated to be 10 to 20 years. This is based on fire frequency as *Xanthosia* are mostly killed after fire. The estimated fire frequency in the region where the taxon occurs, based on past fires, is 10 to 20 years.

Distribution

In Victoria, the taxon is confined to a bluff immediately north of Raymond Creek Falls in the Snowy River National Park, East Gippsland.

Habitat

The taxon occurs on open woodland with a shrubby understorey on rhyadacite (VicFlora 2016).

Threats

The taxon is threatened by climate change and the associated increases in both fire frequency and intensity, as well as a decrease in rainfall. An increase in fire frequency and intensity would kill plants before they reach a reproductive age, and a decrease in rainfall may also decrease recruitment, growth, and flowering of existing plants.

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:

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.

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 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 Area of Occupancy (AoO) to ensure consistency with the definition of AoO as an area within EoO.

It is estimated to have one location, having only been recorded from a single site.

It has a continuing decline in (iii) above based on the current and projected impact of the identified threats, such as the impact of climate change resulting in lower rainfall and a change in fire frequency.

Eligible under Criterion B2 as Critically Endangered

The 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 have 1 location and has a continuing decline in (iii) 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

The number of individuals at the sole site of occurrence in Victoria has never been recorded.

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

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

VicFlora (2016). Flora of Victoria, Royal Botanic Gardens Victoria: *Xanthosia stellata*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/8cf02a43-c5a6-47b7-9820-9cd78fe74ee9