Threatened Species Assessment

Oxalis magellanica
Snowdrop Wood-sorrel

Taxonomy

Oxalis magellanica G. Forst.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criterion B2ab(ii,iii,v)

Species Information

Description and Life History

Rhizomatous or stoloniferous herb to c. 10 cm high; stems slender, internodes much reduced so that leaves appear c. radical; taproot absent; bulbils absent. Leaves 3-foliolate; leaflets sessile, broadly obcordate, 2-12 mm long, 2-13 mm wide, bilobed, green, glabrous above, sparsely appressed-pubescent below, margins ciliate, sinus to c. one-fifth, (rarely one-third) leaflet length with callus in notch, lobes oblong to obovate, apices rounded, 2-6 mm apart; petioles 1-5(-7) cm long, with sparse long spreading hairs; stipules conspicuous, to c. 5 mm long, membranous, apex rounded to truncate, glabrous, persistent. Inflorescences axillary, 1-flowered; peduncles usually longer than leaves, sparsely hairy. Sepals elliptic, 3-5 mm long, ciliate; petals 6-12 mm long, white. Capsule ovoid to globose, 4-5 mm long, glabrous; seeds not transversely ribbed. Flowers October-February (VicFlora, 2019).

Generation Length

The generation length of *Oxalis magellanica* is suspected to be 30 to 50 years. The taxon is a rhizomatous or stoloniferous herb of montane to sub-alpine forests in high rainfall areas. While plants would reach reproductive maturity at a young age, they are potentially very long-lived through vegetative growth. Some mortality can be expected from lyrebird activity and canopy fall.

Distribution

The taxon is rare in Victoria, where it is recorded from the Otway Ranges, the Central Highlands between Lake Mountain and Baw Baw Plateau, and the Errinundra Plateau in East Gippsland.

Habitat

The taxon's main habitat are tall mountain forests, Cool Temperate Rainforest and Sub-Alpine Woodland dominated by *Eucalyptus pauciflora* (Snow Gum).

Threats

The most serious threats to the taxon would be climate change (decreased rainfall), and changes to the vegetation structure and composition due to past forestry operations in the habitat and increased frequency and intensity of fire. The taxon's response to timber harvesting and regeneration practices is not documented. Occurrences may also be vulnerable to physical damage to soils and the structure of the vegetation caused by deer. Weed invasion in the relevant habitats is a potentially more serious problem in the future than it is now.

Spatial analysis of likely habitat for the taxon indicates that 58% occurs within the Comprehensive, Adequate and Representative (CAR) reserve system, including parks, reserves and special protection zones in State forest. Other more general prescriptions under the Victorian Code of Practice for Timber Production 2014 (the Code) such as protection and buffering of rainforests also provide protection from forestry operations. Species-specific protections for the taxon are included in the Code in North East Forest Management Areas. In recent years, modified harvesting and forest regeneration practices have been implemented in native forest that are designed to further mitigate the potential threat from forestry operations to threatened species and their habitats. Native forest timber harvesting on public land has been phased out in the Otways since 2008 but small scale community forestry continues. Harvesting on private land and in plantations continues in parts of its range.

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 Vulnerable

The population reduction over the past 90 to 150 years is suspected to be 20 to 50% (likely 40%), based on (b) and (c) above.

Decline is presumed, but relevant population data are unavailable. The extent to which past forestry operations within wet montane forests and recent hot fires have reduced the population of the taxon is not known.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 90 to 100 years is suspected to be 20 to 40%, based on (b), (c) and (e) above.

Longer term decline seems likely due to the impacts of climate change, and potentially habitat degradation due to increased fire frequency and intensity.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is inferred to be 20 to 40%, based on (b), (c) and (e) above.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 16,067 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to have two or three locations. While the taxon occurs in three disjunct localities, it is confined to a relatively narrow range of habitat where potentially subject to similar ranges of threat. It may be appropriate to consider reserved and unreserved occurrences as representing different locations due to the potential for habitat modifications associated with private land and plantation forestry.

It has a continuing decline in (ii), (iii) and (v) above, due to the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 192 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is estimated to have two or three locations and has a continuing decline in (ii), (iii) and (v).

It has a continuing decline in (ii), (iii) and (v) above, due to 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.

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 (2018) Flora of Victoria, Royal Botanic Gardens Victoria: *Oxalis magellanica*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/571bb0d7-46f5-4fc0-88d0-dd0831d6797c