Threatened Species Assessment

Utricularia violacea
Violet Bladderwort

Taxonomy

Utricularia violacea R. Br.

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(i,ii,iii,iv)c(iv)

Species Information

Description and Life History

The taxon is a terrestrial annual herb; stolons absent. Leaves numerous, rosetted, rosettes 1.2-1.5 cm in diameter, leaves narrowly linear-cuneate to spathulate, 4-5(-12) mm long, c. (0.5-)3 mm wide. Traps moderately numerous from the stem, obliquely ovoid, 1.5-2 mm long, dorsal appendage above trap opening subulate, c. 1mm long, fringed on inner margin, lateral appendages 0.45-0.5 mm long, distally fimbriate. Racemes 1-4, erect, 2.5-10 cm long, 1-flowered; sterile bracts absent; fertile bracts medifixed, c. 1.5 mm long; bracteoles similar to bracts; calyx-lobes subequal, upper lobe broadly obovate, 1.8-2 mm long, 2-2.2 mm wide, lower lobe broadly ovate, 1.4-1.5 mm long, 1.9-2 mm wide. Corolla 4-9 mm long, lower lip violet, palate glabrous, pale yellow with 4 raised ridges subtended by c. 3 dark violet or maroon lines; upper lip obovate, bilobed; lower lip much larger, transversely oblong or elliptic, obscurely to markedly 3-lobed; spur cylindric from a conical base, c. twice as long as lower lip. Capsule globose, 1.5-2 mm diameter; seeds ovoid, c. 0.3 mm diameter. The taxon flowers mostly from October to December (VicFlora 2019).

Cliff Beauglehole, who is responsible for almost every Victorian specimen, list or incidental record of the taxon, noted in 1964 a pale-coloured form appearing in hundreds in a shallow temporary swamp on the north side of the Dergholm-Penola Road at the Comaun Road turnoff, 5 km east of the South Australian border, in association with the normal violet form.

Generation Length

The generation length of *Utricularia violacea* is estimated to be 1 to 15 (midpoint 5) years. The taxon is a terrestrial annual herb which is likely to recruit episodically in response to seasonal conditions or fluctuations in water levels in swamps. At the time of settlement pulse recruitment is likely to have occurred reliably every season or at intervals determined by alternating El Nino and La Nina events with some additional sporadic recruitment cued by localised disturbance events such as animal digging or fire. Pulse recruitment in response to release from inundation, fire or optimal rainfall events is from a soil-stored seedbank at intervals likely to be determined by La Nina cycles. Longevity is inferred to be one year or less. Fire is likely to be frequent in the landscape, at intervals determined by fuel loads and El Nino events, with higher penetration into wet heath habitats but less frequent penetration into wetland habitats.

Distribution

The taxon is rare in Victoria, where it is apparently restricted to the south-west between the Little Desert and Portland. It also occurs in WA, SA and Tasmania, where it is restricted to islands in Bass Strait (VicFlora 2019).

The Victorian stronghold of the taxon is from Dergholm and Roseneath south toward Dartmoor, between Casterton and the South Australian border, with outliers in the western sector of the Little Desert National Park, Jilpanger Nature Conservation Reserve, Glenisla in the western Grampians and the Lower Glenelg National Park.

Habitat

The taxon is apparently confined in Victoria to wet heaths and swamps (VicFlora 2019). It is a habitat specialist restricted to sites of low fertility, high organic content in the substrate and permanently or seasonally waterlogged soils. As such, they are not particularly susceptible to weed invasion. Substrates include sandy peat or 'sandy soil on edge of swamp in water up to 10 cm deep.'

Victorian collectors record the taxon growing in shallow depressions or exposed patches in wet heathland or shallow temporary swamps in association with *Allittia uliginosa* (Small Swamp-daisy), *Baumea acuta* (Pale Twig-sedge), *Caesia parviflora* (Pale Grass-lily), *Centrolepis glabra* (Smooth Centrolepis), *Empodisma minus* (Spreading Rope-rush), *Eurychorda complanata* (Flat Cord-rush), *Leptospermum continentale* (Prickly Tea-tree), *Melaleuca brevifolia* (Mallee Honey-myrtle), *Patersonia occidentalis* (Long Purple-flag), *Stylidium beaugleholei* (Beauglehole's Triggerplant), *S. despectum* (Small Triggerplant), *S. perpusillum* (Slender Triggerplant) and *Utricularia dichotoma* (Fairies' Aprons).

Threats

The taxon is very likely to have undergone significant historic decline through habitat loss to agriculture, and habitat modification in response to a range of land management practices which have altered the hydrological regimes on which the taxon and its habitat are dependent. The taxon is restricted to sites with permanently or seasonally waterlogged soils. As such, they are not particularly susceptible to weed invasion. Many sites are threatened with continuing habitat degradation through agricultural intensification including extension of cropping, wetland drainage, vehicle traffic, infrastructure maintenance, fire management activity, stock agistment, site conversion to woodlot and farm forestry and large-scale plantation establishment.

The taxon is threatened by physical disturbance to the fragile wetland habitat by exotic herbivores, particularly hard-hooved herbivores such as cattle, sheep, horses and deer, all of which pug small depressions or openings within the wet heath or wetlands habitat. Feral pigs can also excavate the soil in wetland and wet heathland habitats in search of roots, rhizomes, tubers and other storage organs.

The taxon is also threatened in the longer term by climatic drying which is projected to reduce the reliability of winter rainfall events, reducing the extent and quality of available habitat and increasing the risk of seedbank depletion, recruitment failure and local extinction.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8,750 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the subregional and landscape scales and anthropogenically at the landscape scale. The taxon is may be dispersed by water within each swamp or wetland unit, many of which are not connected to major drainage systems. The taxon may also be dispersed by waterbirds at the landscape scale

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

It is estimated to have extreme fluctuations in (iv) above since population density of each cohort at any one site is likely to reflect seasonal conditions, which are expected to fluctuate with El Nino and La Nina cycles.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 96 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, it is severely fragmented, has 2 locations, has a continuing decline in (i), (ii), (iii) and (iv) and extreme fluctuations in (iv) 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

There is no available estimate of population size for the taxon in Victoria. Estimates of population size would have no relevance for detecting long-term trends since population density of each cohort at any one site is likely to reflect seasonal conditions which are expected to fluctuate with El Nino and La Nina cycles.

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 (2019) Flora of Victoria, Royal Botanic Gardens Victoria: *Utricularia violacea*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/1cb9188d-a2bb-4af2-91ef-339bfce67a10