

## *Triglochin trichophora* Torpedo Arrowgrass

### Taxonomy

*Triglochin trichophora* Nees

This taxon closely resembles and has been confused with *T. nana*, from which *T. trichophora* is distinguished by its rounder fruits and the presence of two minute downward pointing spurs between the lateral ones (VicFlora 2019).

### Current conservation status

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

### Proposed conservation status

Critically Endangered in Victoria

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

### Species Information

#### Description and Life History

The taxon is a slender annual herb, 1.5-13 cm high. Leaves flat and thread-like, 1-8 cm long, shorter than to almost as long as inflorescence. Scape at fruiting erect, ascending or spreading, 0.4-11.0 cm long, inflorescence 0.6-3.6(-6.0) cm long, with (1-)4-49 fruits. Fruits broadly ovoid or ellipsoid, often tapered at apex and contracted at base, (1.3-)1.5-3.2 mm long, 0.6-1.8 mm wide above just above base; subsessile or pedicel up to 6 mm long; carpels 6, 3 fertile carpels alternating with 3 undeveloped sterile ones; fertile carpels keeled or strongly convex dorsally when dry, at base with 2 lateral spurs or points c. 0.02 mm long, usually with 2 deflexed spurs connected by a membrane between the lateral spurs. The taxon fruits from July to December (VicFlora 2019).

#### Generation Length

The generation length of *Triglochin trichophora* is inferred to be 1 to 25 years. Generation length is based on the knowledge that the taxon is an annual and likely to recruit after good rains. It also may be cued by events which, in some circumstances, may be almost annual and, in other circumstances (for example, on elevated aeolian deposits) may require exceptional rainfall events that occur at decadal frequencies only.

#### Distribution

In Victoria, the taxon grows further inland near Horsham. It has previously been overlooked in Victoria, where it is currently known from two collections. Additionally, *T. trichophora* is widespread in coastal regions of South Australia, and it is possible that other populations of this taxon occur in western Victoria (VicFlora 2019).

The distribution is based on two specimen records collected by Beaglehole in 1986 in Barrabool Flora and Fauna Reserve and the contiguous Marma State Forest.

#### Habitat

Although the taxon is 'typically a coastal or near coastal species of sands and calcareous soils' (VicFlora 2019) in South Australia and Western Australia, the sole Victorian occurrence is east of Horsham in a region with ancient marine deposits. It is unclear whether either or both collections were taken on alluvial flats, associated with the

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Wimmera River or on distinctive lunettes comprising lenses of deep sand at the northern end of the Barrabool forest block.

## Threats

It is undocumented whether either or both of the two known collections of the taxon were taken on deep sands of distinct lunette features or on heavier soils on flatter terrain near the adjacent Wimmera River. Irrespective of this, key threats identifiable for either of these habitats include reduced reliability of rainfall events that are required for successful seed recruitment, and reduced flow of the Wimmera River which contributes to the moisture availability in heavier soils within the Barrabool forest block. The taxon is also threatened by the increasing risk of lunette displacement, in response to extreme and protracted drought and, potentially, the impact of rabbits in plague proportions.

## 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>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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## 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.

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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 8 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO is based on two specimen records collected by Beauglehole in 1986 in Barrabool Flora and Fauna Reserve and the contiguous Marma State Forest. The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to have 1 location. The key identified threats plausibly influence recruitment success, seed bank replenishment and persistence of the taxon at both collection sites. Therefore, the taxon is estimated to occur in a single location in Victoria.

It has a continuing decline in (iii) based on the current and projected impact of the identified threats.

The taxon is estimated to have extreme fluctuations in (iv) above. Consistent with all other annual *Triglochin* taxa, this taxon is subject to extreme fluctuation in population size, since it is a tiny dwarf annual that recruits in response to water availability. This is likely to fluctuate significantly throughout El Nino and La Nina cycles. It also recruits in response to flood regimes, both of which may apply at sites close to the Wimmera River.

#### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, it is estimated to have 1 location, has a continuing decline in (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 as Data Deficient

There are no collectors' notes to indicate the population size at the time of collection, which was on two successive days in a single season in October 1986.

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 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.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Triglochin trichophora*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/0f7d0475-b96c-4200-9229-d109466a1049>