# Threatened Species Assessment

## *Triglochin mucronata*
## Prickly Arrowgrass

### Taxonomy

*Triglochin mucronata* 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,v)c(iv)

### Species Information

#### Description and Life History

The taxon is a small annual herb, (2-)2.5-6(-9) cm high. Leaves flat and thread-like, 2-5(-7.5) cm long, usually shorter than or almost as long as infructescence. Scape at fruiting erect, ascending or spreading, (1.2-)3-7 cm long; infructescence (0.1-)0.4-0.9(-1.5) cm long, with (1-)3-6(-15) fruits. Fruits inverted-pyramidal, 1.7-2.5 mm long, 1.5-2.2 mm wide (excluding spreading points), subsessile (pedicel up to 0.2 mm long); carpels 6, free distally, 3 fertile carpels alternating with 3 undeveloped sterile ones; fertile carpels concave to slightly convex dorsally when dry, distally truncate with 1 median spreading point c. 1 mm long; sterile carpels with a conspicuous erect to spreading point. The taxon fruits from September to November (VicFlora 2019).

#### Generation Length

The generation length of *Triglochin mucronata* is estimated to be 5 to 25 years. Generation length is based on the plausible pre-settlement frequency of flood events or exceptional rainfall events. The taxon is inferred to recuit episodically in response to flood events or exceptional rainfall events.

#### Distribution

The taxon also occurs in Western Australia, South Australia, and Tasmania (VicFlora 2019). In Victoria, the taxon is reliably recorded from highly disjunct coastal sites near Nelson, on the shores of Port Phillip Bay and the Bellarine Peninsula, and the Gippsland Lakes. The greatest concentration of inland records is in the western Wimmera, from the Dimboola district south to the Kanagulk district, with outlying occurrences at the Pink Lakes, Dunkeld and Rossbridge districts.

#### Habitat

The taxon occurs in herbfields on damp saline soils of salt-flats and coastal saltmarshes (VicFlora 2019).

#### Threats

The taxon has suffered severe historic decline in response to the reduced reliability of flood events as a consequence of water diversion for irrigation and town water supplies. The taxon has also been eliminated from some sites by habitat loss or modification in response to agricultural activity. The taxon continues to be threatened by reducing reliability of both flood events, particularly at inland sites, and rainfall events in response to climatic

drying. Some coastal sites are also at continuing risk of habitat loss and modification in response to coastal development, agricultural activity and changes to salinity arising from sea level rise and coastal instability.

## 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 B2 as Endangered**

The Area of Occupancy (AoO) across the taxon's range is estimated to be 120 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales and anthropogenically at the landscape scale. Geographically discrete occurrences are separated at distances likely to exceed the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal.

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

The taxon is estimated to be subject to extreme fluctuation in population size following successive recruitment events, in response to fluctuating seasonal conditions.

| 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 which is, in any case, subject to extreme fluctuation between successive recruitment events.

| 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<br>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:<br>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.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Triglochin hexagona.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/c1834e2f-3187-4ecb-8670-b8aae4a66806