Threatened Species Assessment

Atriplex holocarpa
Pop Saltbush

Taxonomy

Atriplex holocarpa F. Muell.

Other *Atriplex* taxa with galled or inflated fruits, notably *A. lindleyi* subsp. *inflata,* may be misidentified as *A. holocarpa*.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988*.

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

Proposed conservation status

Endangered in Victoria

Criterion B2ac(iv)

Species Information

Description and Life History

The taxon is an erect or rounded annual or short-lived perennial to c. 30 cm high, monoecious. Leaves petiolate, alternate, rhombic or broadly hastate, mostly 10-20 mm long and wide, mealy on both surfaces with vesicular hairs, margin dentate or sinuate. Flowers in axillary clusters of one or both sexes. Fruiting bracteoles sessile, wholly united into a globose or broadly obovoid, firmly spongy structure 8-12 mm long, woody in the centre. The taxon fruits from September to October (VicFlora 2019).

Generation Length

The generation length of *Atriplex holocarpa* is estimated to be 5 to 10 years. This is based on the mean interval between La Niña events, which provide reliable rainfall for optimal recruitment from a soil-stored seedbank. The longevity is likely to be 3-5 years, although the taxon may behave as a facultative annual. The taxon is moderately palatable and, although not preferentially browsed by kangaroos or goats, it is browsed by stock confined to small areas or in the absence of other more acceptable forage. The taxon recruits opportunistically in favourable seasons, and is not dependent on flood events for successful recruitment.

Distribution

The taxon occurs within inland areas of all mainland states and the Northern Territory. In Victoria, the taxon is apparently confined to the far north-west (Hattah-Benetook area), where it is localised and uncommon (VicFlora 2019).

Some outlying site records not supported by reliably determined specimens may result from misidentification of other *Atriplex* taxa with inflated or galled fruits, notably *A. lindleyi* subsp. *inflata*.

Habitat

In Victoria, the taxon is apparently localised and uncommon on sandy soils prone to seasonal flooding (VicFlora 2019).

Threats

Consistent threats to Victorian occurrences are difficult to identify with confidence. The best Victorian habitat occurs in the Murray Scroll Belt Bioregion west of Merbein, much of which is currently managed for conservation. The taxon is potentially threatened by weed invasion by exotic taxa, such as *Carrichtera annua* (Ward's Weed) and *Mesembryanthemum nodiflorum* (Small Ice-plant).

In the longer term, the taxon may be threatened by reducing reliability of winter rains in response to climatic drying and altered seasonality of rainfall events. Some occurrences on floodplains are potentially threatened by the reducing reliability of flood events in response to climatic drying and diversion of floodwaters for agriculture.

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 9,916 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally and anthropogenically at the landscape scale. Geographically isolated occurrences are interpreted as distinct subpopulations since they occur at separations which are likely to exceed the dispersal range of the taxon. The taxon has large seeds that are not readily dispersed, except potentially by floodwaters when on floodplain sites, and are also potentially wind dispersed a few hundred metres only. This precludes the possibility of recolonisation in the event of local extinction.

It is estimated to have 2 locations. It has extreme fluctuations in (iv) above, which occurs in response to seasonal rainfall and flood events.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 110 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 and has 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

No reliable estimate of total population size is available. Any estimate is likely to be an artefact of recent seasonal conditions.

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:

Ineligible under Criterion D

No reliable estimate of total population size is available.

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.

SAC (2003). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 636 *Atriplex holocarpa*.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Atriplex holocarpa*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/8da41360-f902-4073-80b2-d2cebf547908