Threatened Species Assessment

Limonium australe var. *australe*
Yellow Sea-lavender

Taxonomy

Limonium australe var. *australe* (R. Br.) Kuntze

One of two varieties in this species; the other variety is Tasmanian.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A2ce+3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

Glabrous perennial with erect, ridged or angular flowering stems, 20–45 cm high. Leaves rosetted at base, oblanceolate to spathulate, tapered gradually to petiole, 5–15 cm long, 8–25 mm wide, entire, but margin often undulate. Inflorescence corymbose; spikelets 2- or 3-flowered, crowded in the upper 1–4 cm of numerous, more or less erect ultimate branches; bracts ovate, entire, the outer and middle bract 2–4 mm long, the inner 6–8 mm long; calyx 6–8 mm long, white to pink, the tube 4–5 mm long, 5-ridged, usually with a row of short inclined hairs along the ridges, the limb 2–3 mm diam., with 5 more or less acute lobes; petals fused shortly at base, slightly longer than calyx, yellow. Capsule 5-angled, circumsciss near base; seed flattened-fusiform, c. 3 mm long, brown. Calyx glabrous. The taxon flowers mainly in January and April (VicFlora 2019).

The taxon has a thick tap root. Fire is not an issue in its saltmarsh habitat. It propagates by seed only and recruitment is continuous. Its breeding system is unknown (i.e., whether self-fertile or an obligate outcrosser). Many European species are apomictic. The taxon is presumed to be normally sexually reproductive and insect pollinated for a nectar reward. Whether there is a soil-stored seedbank is unknown, and if so, its longevity is unknown but probably short-lived. Seed dispersal probably occurs locally by wind blowing the papery calyx with its enclosed capsular fruit. Marine currents and probably shore birds also disperse seeds.

Generation Length

The generation length of *Limonium australe* var. *australe* is suspected to be 10 to 20 years. and. The taxon is a relatively short-lived perennial that has continuous recruitment and has maintained (relatively) stable populations under undisturbed pre-European settlement conditions.

Distribution

The taxon occurs in coastal saltmarsh from the Bellarine Peninsular east to Corner Inlet.

Habitat

The taxon occurs in coastal saltmarsh communities around the boundary of lower (wet) saltmarsh, and upper (dry) saltmarsh. It is absent from the low-rainfall saltmarsh on the western shores of Port Phillip Bay.

Threats

Threats include climate change (decreased rainfall, increased evaporation, extreme temperatures); sea level rise (drowning of coastal saltmarsh, coastal erosion, storm surge and increased salinity); pollution (e.g., oil spills); invasion of saltmarsh by Grey Mangroves (*Avicennia marina*); and decreased salinity resulting from anthropogenic freshwater inputs (e.g., storm water).

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 Endangered

The population reduction over the past 30 to 60 years is inferred to be 30 to 50%, based on (c) and (e) above.

Past reduction of the taxon's population is based on historic losses of saltmarsh habitats due to land-fill, sea walls and other infrastructure (see Victorian Saltmarsh Study 2011).

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A2 as Endangered

The population reduction over the next 30 to 60 years is inferred to be 50%, based on (c) and (e)above.

Future reduction of the taxon's population is based on the projected impacts of projected sea-level rise (State of Victoria 2014) and the taxon’s inability to move landward because of topography, settlement infrastructure, etc.

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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4,708 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is severely fragmented naturally at the landscape scale. Geographically isolated stands occur at distances typically exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

I it inferred to have five locations. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above due to the identified threats, particularly sea-level rise and the inability to move landward.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 204 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has five locations and a continuing decline in (i), (ii), (iii), (iv) and (v) 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 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.

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