Threatened Species Assessment

Avicennia marina subsp. *australasica*
Grey Mangrove

Taxonomy

Avicennia marina subsp. *australasica* (Walp.) J. Everett

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 A3ce+4bce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a shrub or small tree c. 1-4 m high; branchlets, inflorescences and lower surface of leaves greyish or silvery; pneumatophores numerous and projecting from the shallow lateral roots. Leaves narrowly obovate to obovate or elliptic, 3.5-12 cm long, 1-4 cm wide, leathery, apex acute to obtuse, base cuneate, margins entire, upper surface usually glabrous, lower surface minutely greyish or silvery hairy; petiole 5-10 mm long. Cymes dense, in upper axils or arranged in terminal panicles; peduncles angular, 10-25 mm long. Calyx 2.5-3 mm long; corolla white, yellowing with age, tube 1-2 mm long, lobes 3-4 mm long. Capsule compressed-ovoid, 20-30 mm diam.; seed germinating before fruit falls. The taxon flowers most of year (VicFlora 2017).

Generation Length

The generation length of *Avicennia marina* subsp. *australasica* is estimated to be 50 to 100 years. Mangroves, such as *Rhizophora* and *Avicennia* spp., are known to live for between 50 and 100 years on average (Clarke 1992; Feller et al. 2007; Verheyden et al. 2004).

Distribution

In Victoria, the taxon occurs from western Port Phillip Bay and the Bellarine Peninsula east to Corner Inlet with an outlying occurrence at Lakes Entrance. The taxon also occurs on all mainland States.

Habitat

The taxon is locally common on tidal mudflats in bays, river mouths and estuaries (VicFlora 2017).

Threats

A significant loss is likely to have occurred as a result of past coastal clearing and habitat loss. This is continuing, but the main threat to mangroves is sea level rise due to an increase in the average global temperature. To respond to sea level rise, mangroves either need to move vertically by accumulating sediment to make new higher land at the same site, or migrate landwards to areas that are at the appropriate height that corresponds to the extent of inundation and salinity that the taxon can tolerate. Past rates of sea-level change demonstrate that mangroves can keep up with a sea-level rise of up to 45 cm per 100 years. Sea-level rise faster than this rate will be detrimental to mangrove due to issues associated with erosion, inundation and increased salinity. The taxon is observed to be strongly competitive in relation to both exotic weeds and indigenous species.

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 Vulnerable

The population reduction over the past 150 to 300 years is estimated to be 30 to 50% (midpoint 40%), based on (b), (c) and (e) above.

The taxon has almost certainly declined to a large degree since European settlement, as a result of coastal clearing and habitat modification.

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is projected to be 25 to 75% (midpoint 50%), based on (c) and (e) above.

With sea-level rise, it is expected that the taxon will need to move inland to match an appropriate level of inundation. Along approximately 60% of the coastline that the taxon occupies, human infrastructure (e.g. roads, towns, airports) and farming forms an inland boundary close to the coast which will probably not allow for the required room for the taxon to migrate inland.

Eligible under Criterion A4 as Endangered

The population reduction over any 150 to 300 year period, including both past and future (up to 100 years in the future), is estimated to be 45 to 85% (midpoint 65%), based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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 220 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

It is estimated to have one location. All plants occur along the coast and as such all individuals are affected by the threat of sea-level rise which can rapidly affect all individuals present.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the major threat of sea-level rise.

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

It is estimated that there are 22,000 to 44,000 mature individuals, which exceeds the thresholds for criterion C.

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 D 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

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