Threatened Species Assessment

Melaleuca armillaris subsp. *armillaris*
Giant Honey-myrtle

Taxonomy

Melaleuca armillaris subsp. *armillaris* (Sol. ex Gaertn.) Sm.

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)

Species Information

Description and Life History

The taxon is a spreading shrub or small tree, to c. 6 m high; bark hard, shallowly fissured, occasionally corky. Leaves alternate, linear, 1.2–2.5 cm long, c. 1 mm wide, concave above, gland-dotted below, tip narrowly acute, recurved; petiole 1–2 mm long. Inflorescence a dense spike, 3–7 cm long, 2.0–2.8 cm wide, arising as a side branch; axis glabrous to hairy, growing on into a leafy shoot. Flowers subtended by a caducous bract which is nearly as long as the leaves and has a leaf-like tip; stamens 13–18 per bundle, cream to white or rarely pinkish-mauve, claw 5–6 mm long, free part of filaments c. 3–7 mm long. Capsules 3–5 mm wide, sepals mostly persistent, pointed to undulate on the capsule rim. The taxon flowers in summer (VicFlora 2019).

M.armillaris subsp. *armillaris* is a long-lived large shrub or small tree that is fire sensitive and recruits *en mass* after fire from its very large canopy-stored seedbank. Seeds are released when the woody capsules, which can persist for 10 years or more, dry out on the death of the plant. Reproduction is only by seed, and pollination is by honeyeaters and generalist insects such as solitary bees, wasps, and flies, as well as exotic honeybees, for pollen and nectar rewards. While seed is passively shed to renew the stand post-fire, there is evidence that seeds are dispersed by water (e.g., along drains) and by convection updrafts during fire. Plants are self-fertile, but outcrossing is probably genetically advantageous.

Generation Length

The generation length of *Melaleuca armillaris* subsp. *armillaris* is suspected to be 50 to 80 years. This is based on the recruitment fire interval of this fire-sensitive taxon, and episodic recruitment after fire.

Distribution

M. armillaris subsp. *armillaris* occurs on several islands of Wilsons Promontory, and in far East Gippsland east of Marlo on coastal and subcoastal rocky sites and in riparian scrubs.

Habitat

The natural habitats of the taxon (cf. naturalised populations which occur in a wide variety of ecological contexts) are coastal and near-coastal sandy heaths, scrubs adjoining saltmarshes, riparian scrubs, rocky coastlines, and foothill rock outcrops of Silurian sediments, granite, and granodiorite.

Threats

Threats to the taxon include the effects of climate change such as decreased rainfall, increased evaporation, extreme temperatures, sea-level rise drowning low-lying habitats (e.g., upper saltmarsh), coastal erosion and storm surge, increased frequency and intensity of fire, and soil loss on bare post-fire substrates resulting from severe rainfall events. Other threats include extreme rainfall events (1 in 100 year floods) causing flash floods, soil erosion, and/or severe scouring of riparian environments, environmental damage to soils and vegetation, browsing by deer, particularly Hog Deer (*Axis porcinus*), and weed invasion.

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

The past population reduction does not meet the threshold for eligibility under Criterion A2, and the future population reduction does not meet the threshold for eligibility under Criterion A3.

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 8,693 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to have three locations as the main threats to the taxon have a non-reversible impact on the individuals of the taxon, occur in a stochastic manner, and have the potential over time to threaten the majority of individuals in the geographic area. There are considered to be three such areas: Wilsons Promontory, east Gippsland, and far east Gippsland.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the impacts of the identified threats, such as the effects of climate change, extreme rainfall events, damage to soils and vegetation, browsing by deer, and weed invasion.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 212 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has three locations, and has 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 inferred 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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