Threatened Species Assessment

Eucalyptus elaeophloia
Olive Mallee

Taxonomy

Eucalyptus elaeophloia Chappill, Crisp & Prober

Current conservation status

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

Proposed conservation status

Vulnerable in Australia

Criteria D1+2

Species Information

Description and Life History

The taxon is a mallee or tree to 12 m tall; bark mostly smooth but with partly shed slabs, red-brown and grey over greenish to coppery-orange. Juvenile leaves sessile, opposite for many pairs, orbicular, then alternate, elliptic to ovate, to 4 cm long, 3 cm wide, dull, green to blue-green, slightly glaucous at least on growing tips; adult leaves with flattened petioles, alternate, lanceolate, to 11.5 cm long, 2.5 cm wide, concolorous, glossy, green; reticulation dense, with sparse, small, island oil glands. Inflorescences axillary, unbranched: peduncles stout, to 0.4 cm long, 3-flowered; buds more or less sessile, ellipsoid, 0.7 cm long, 0.3 cm diam., scar present; operculum conical; stamens inflexed; anthers dorsifixed, cuneate; ovules in 4 vertical rows; flowers white. Fruit sessile, hemispherical, to 0.5 cm long, 0.9 cm diam.; disc ascending; valves 3, exserted; seed dark brown, flattened-ellipsoid, lacunose, hilum ventral. The taxon flowers in March, but imperfectly known (VicFlora 2019).

Generation Length

The generation length of *Eucalyptus elaeophloia* is inferred to be 50 to 150 years. This is based on the extended natural fire intervals generally associated with montane plateau environments, and the lignotuberous habit of the taxon. It is also based on the inference that the age of multi-stemmed individuals of Mallee habit is likely to greatly exceed the average interval between bushfire events (Rule 2005).

Distribution

The taxon is a narrow endemic currently known only from Brumby Point and Diggers Hole Spur on the Nunniong Plateau, and at Moscow Creek in the Cobberas in the remote north of the East Gippsland region in eastern Victoria. At Brumby Point, the taxon is recorded from at least two sites south of the Brumby Point track (Coates et al. 2004;Rule 2005), and these populations are entirely protected within the Buchan Headwaters Wilderness Zone within the Alpine National Park (Chappill et al. 1990). The Diggers Hole Spur population extends approximately 1.2 km along the ridgeline on either side of the Diggers Hole Track, 3 km east of the Brumby Point Track (Chappill et al. 1990), which is located on the southern boundary of the Alpine National Park. Trees on the north side of the Diggers Hole Track are protected within the Alpine National Park, but are outside the Buchan Headwaters Wilderness Zone. Trees on the south side of the track are in state forest (Chappill et al. 1990, DSE CGDL 2006), and no zone within the Alpine National Park is actively managed specifically for the conservation of the taxon. The Moscow Creek population is located on the east side of Moscow Creek 450 m north-east of its origin at Moscow

Flat (Coates et al. 2004; Rule 2005), which is entirely protected within the Cobberas Wilderness Zone in the Alpine National Park (DSE CGDL 2006).

The total population size is estimated to be within the range of 500-700 individuals, which were mature at the time of the January 2003 bushfire. Post-fire monitoring of 3 of the 4 known populations in 2004 indicated that the crowns of all individuals were destroyed by this intense fire event, and that all surviving plants were resprouting from the lignotuber (Coates et al. 2004). The number of mature individuals in each population is assumed to have declined to zero, pending the vegetative recovery of all surviving individuals, or the survival to reproductive maturity of any seedling recruits established following the 2003 bushfire. Preliminary monitoring of the Brumby Point and Moscow Creek populations in 2004 suggested that mature plants whose crowns were destroyed by the fire had resprouted vigorously from the lignotuber, and were expected to recover successfully from that particular fire event. Seedlings were apparently rare at these sites in 2004, although were difficult to identify with confidence in the presence of other taxa of similar habit at maturity (Coates et al. 2004).

Habitat

The taxon is confined to subalpine tall shrubland and grassy open forest on broad ridgelines. It is also found on upper slopes in rugged montane topography at an elevation of 1400-1500 metres above sea level. It is strictly confined to the Victorian Alps bioregion (DSE FIS 2005; Rule 2005).

Threats

The greatest threat to this taxon is the potential impact of stochastic events such as bushfire, drought, or storm of unprecedented severity or duration, which may lead to the sudden depletion or local extinction of individual populations (Rule 2005). All known populations were burnt in the catastrophic bushfire of January 2003, and the entire population at each site thoroughly incinerated. Whilst preliminary monitoring of the post-fire recovery of the taxon (Coates et al. 2004) suggests that resprouting individuals were likely to recover successfully, there was little evidence of seedling recruitment, and the mortality rates for burnt adults and seedling recruits were unknown.

Feral horses are a potential threat to all populations on the Nunniong Plateau, and are an active and ongoing threat to the Moscow Creek population. Coates et al. (2004) report numerous feral horse tracks in the Moscow Creek area and much soil disturbance likely to impede seedling recruitment. Browsing by native and feral animals is a threat to both seedlings and vegetative resprouts from the lignotubers of surviving individuals, and trampling is a threat to seedling recruits (Rule 2005).

The Diggers Hole Spur population is threatened by roadworks, and potentially by other unsympathetic forest management activity. It has been noted that "A graded track bisects the Diggers Hole Spur population along its entire 1.2 km length. Any widening or realignment of this track (which has occurred at least once in the past) would significantly reduce the size of the population and must be avoided" (Chappill et al. 1990). It has also been noted that a proportion of this population is vulnerable because it is outside the boundary of the Alpine National Park, therefore it has been recommended that "Consideration should now be given to shifting the boundary of the (former) Cobberas-Tingaringy National Park to include the whole of Diggers Hole Spur and its entire population of *E. elaeophloia*" (Chappill et al. 1990; Rule 2005).

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.

There is no reliable longitudinal data to suggest that the population has undergone a past decline in population size. Whilst the Brumby Point populations are known to have been burnt by wildfire in 1982, the impact of that fire event is undocumented. Preliminary post-fire monitoring of the Brumby Point and Moscow Creek populations suggests that, in the medium term, all populations are likely to recover successfully from the severe impact of the wildfire of January 2003 (Coates et al. 2004; Rule 2005).

The magnitude of future decline cannot be estimated with any confidence since it is unclear when stochastic events such as severe bushfire, extreme drought and, potentially, targeted browsing pressure by feral horses or Sambar, which may result in both vegetative and seed-based recruitment failure, are likely to result in population decline at any one or all subpopulations.

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 Critically Endangered

The Extent of Occurrence and the Area of Occupancy across the taxon's range are each estimated to be 16 km², but other thresholds under this criterion have not been met.

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 500 to 700 mature individuals, but other thresholds under this criterion have not been met.

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

It is estimated that there are 500 to 700 individuals. The total population size is estimated to be within the range of 500-700 individuals, which were mature at the time of the January 2003 bushfire (Rule 2005).

Eligible under Criterion D2 as Vulnerable

The taxon is estimated to be very restricted, with an AoO of 16km^2, such that this restriction make is possible that the taxon could become Critically Endangered or Extinct within a timeframe of one or two generations, based on the impacts of the identified threats, namely bushfire, drought or storms.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

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