Threatened Species Assessment

Discaria pubescens
Australian Anchor Plant

Taxonomy

Discaria pubescens (Brongn.) Druce

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1991).

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

Proposed conservation status

Critically Endangered in Victoria

Criterion A2ce

Species Information

Description and Life History

According to Downe (2015), *D. pubescens* is a densely- branched, spiny shrub that grows to around 1 m in height. Plants are often multi-stemmed at the ground level, or may produce a main trunk that can reach a diameter of 15 cm (Humphries 1993). The leaves are short-lived, so plants are virtually leafless, with stout spines up to 4 cm long. Flowers are small (approximately 3 mm long) and white with five sepals and five petals and occur at the base of the spines either solitary or in few to many flowered clusters (10-50 flowers). Flowers are produced from November to January. The seeds are produced in small lobed capsules, 4-5 mm in diameter (Walsh and Entwisle 1999). They are brown, shiny, and numerous and are dispersed by explosive splitting of the capsule (Hall and Parsons 1987). Lunt (1987) and Humphries (1993) reported that seedlings of *D. pubescens* have not been recorded in the wild in Victoria, despite detailed surveys over many years. However, more recently several seedlings were found at Windmill Bridge, following weed control work (B. Smith pers. comm. 2010) and at Bendoc (A. Trumbull-Ward pers. comm. 2008). The rarity of seedlings is not likely to be due to problems with seed production or germination (Hall and Parsons 1987). Viable seed has been collected from plants in western Victoria and germinated readily in a glasshouse after cold treatment (Humphries 1993). B. Smith (pers. comm. 2008) found that seeds germinated readily, irrespective of treatment with heat, boiling water, or stratification. Very young and old seeds are slower to germinate and less viable (B. Smith pers. comm. 2008). Hall and Parsons (1987) and Downe (pers. obs. 2007) report that mature plants resprout after low intensity burns. B. Smith (pers. comm. 2010) observed that mature plants burnt by high intensity bushfire in 2009, along the Campaspe River, had resprouted vigorously. However, seedlings transplanted to the area in 2007 showed only 10% survival. The Bendoc area was burnt by bushfire in 2003. Post-fire surveys indicated that the taxon successfully regenerated, however the size of monitored populations reduced by almost half between 2004 and 2007. This may be due to the effects of drought conditions (A. Trumbull-Ward pers. comm. 2007). Willis (1955) noted that the general trend for most natural populations has been a reduction in plant number as mature plants senesce and die.

Generation Length

The generation length of *Discaria pubescens* is estimated to be 30 to 50 years. The taxon is known to have a life span exceeding 30 years (Humphries 1993) and possibly up to 60 years (B. Smith pers. comm. 2008). Recruitment is probably on-going, through resprouting after fire and reseeding between fires in undisturbed vegetation. With fire occurring at a decadal scale**,** but plants still able to survive those fires, most plants will be expected to reach an

older age, with average plant age perhaps 30-50 years. Generation length in this instance largely coincides with average age, given the historic frequency of fire and the plant's ability to resprout.

Distribution

According to Downe (2015), the taxon formerly had a widespread distribution in all eastern Australian states. It has not been recorded in Queensland since 1898 (Willis 1955) and is considered endangered in Tasmania (Coates 1991) and New South Wales (Harden 1990). In Victoria, it is now restricted to fragmented populations in the eastern highlands, and to the west of Melbourne where it is extremely rare (Ballarat district only). The taxon is now possibly extinct in the north-east, where it was formerly known from Mansfield, Wodonga and Mitta Mitta areas. It is scattered and uncommon in the east, in the Snowy Range, Benambra district, Wulgulmerang, Cobberas area, and Bendock (VicFlora 2017). Populations were previously recorded from the Delatite area near Mansfield in 1853, but have not been recorded there since 1895 (N. Walsh pers. comm. 2008). In western Victoria, small populations and individual plants occur along the Campaspe River north of Kyneton, along Birch Creek at Smeaton and near Clunes, and on Lal Lal Creek and Moorabool River West Branch near Lal Lal Reservoir.

In western Victoria most populations are critically low in numbers, while the populations in eastern Victoria are larger. Several populations occur in the Bendoc Nature Conservation Reserve, the largest consisting of up to 500 plants (K. Seaton pers. comm. 2010).

Habitat

The taxon is usually associated with basaltic substrate near streams, in cool, elevated areas (VicFlora 2017). According to Downe (2015), it usually occurs in grassy open woodlands and forests in the east of Victoria (Hall and Parsons 1987) and in stream and river valleys in western Victoria (Lunt 1987). In western Victoria, it typically occurs in high rainfall areas on rocky, basalt-based soils. In the eastern highlands, plants are usually associated with basaltic substrate near streams, in cool, elevated areas (Walsh and Entwisle 1999). Occasionally populations occur some distance from drainage lines and streams (K. Seaton pers. comm. 2010).

Threats

The taxon has clearly been decimated since settlement due to grazing by stock, predominantly cattle and sheep. Cattle have been removed from much of the taxon's range in east Victoria, but feral taxa remain a threat, particularly European rabbits (*Oryctoloagus cuniculus*), European hares (*Lepus europeaus*), and feral horses and deer, of which Sambar Deer (*Rusa unicolor*) are by far the most abundant. Feral horses pose a major threat, especially as the majority of plants grow where such animals commonly graze, on roadsides, paddocks, and water courses (Downe 2015). Tolsma and Cheal (2012) found that most plants within a population of around 40 individuals near Suggan Buggan showed signs of grazing, probably by feral horses. Competition by exotic weed taxa is of serious concern for all populations, and habitat loss and accidental damage during weed eradication programs or construction and maintenance work, especially roadsides and streams, are ongoing issues.

Some populations have recently been burnt by bushfire, and the effects of inappropriate fire regimes such as intensity, season, or frequency on long term survival is not known and may be exacerbated by climate change. Erosion of road batters is also a concern, especially in the Bendoc area, and on stream banks particularly to the west of Melbourne. It has been observed that unseasonal frosts have severely burnt plants in the Bendoc area.

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 Critically Endangered

The population reduction over the past 90 to 150 years is estimated to be 50 to 90%, based on (c) and (e) above.

The population has clearly been decimated since settlement, due to grazing by stock, rabbits, hares, deer, goats, and feral horses, weed competition and weed control, increased fire, and erosion. At least 70-90% of original population is suspected to have been lost since settlement.

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

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 90 to 100 years is projected to be 30 to 50%, based on (c) and (e) above.

The population is likely to continue to decline due to the identified threats, especially small populations in marginal habitat.

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) is estimated to be 300 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented, has 5 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:

Eligible under Criterion C1 as Vulnerable

It is estimated that there are 5,000 to 10,000 mature individuals, and there is estimated to be a continuing decline of 20 to 50% in three generations.

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.

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