Threatened Species Assessment

Hibbertia truncata
Port Campbell Guinea-flower

Taxonomy

Hibbertia truncata Toelken

Juvenile leaves have a dense layer of hooked, simple hairs on the lower leaf surface which are soon replaced by stellate hairs. Plants may resemble *H. empetrifolia* when only juvenile leaves are present (VicFlora 2015).

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criteria A2c+4c; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a prostrate to decumbent shrub up to 40 cm high; branches pubescent to tomentose. Vestiture of tubercle-based stellate hairs. Leaves broadly obovate, 3.5-16(-19.4) mm long, 2-12(-16.2) mm wide, stellate-pubescent, puberulent, rarely glabrescent, juvenile leaves with dense simple hairs on lower leaf surface; petiole 0.4-1.2 mm long; apex truncate, often apiculate, rarely emarginate or rounded; margins narrow, scarcely recurved, lower surface exposed, central vein scarcely raised. Flowers on peduncles 3-16(-22) mm long, terminal on short branches, often with more than one flower growing from the same area, subtended by 1 linear bract, 1.3-1.5(-1.8) mm long, up to half the length of the sepals; sepals 3.6-5.5 mm long, subequal, stellate-tomentose; petals usually obovate, 6-10.6 mm long, slightly papillose, yellow; stamens 10-12; filaments connate for up to half their length; carpels 2, villous. The taxon flowers from September to November (VicFlora 2015).

Field observations indicate that adult plants are often densely intertwined and interlocked, which may have led to the inference that the taxon is capable of root suckering. Adult individuals are typically 1-1.5 m tall, 1-2 m wide and 3-5 (-7) m long in the windward direction, frequently salt-pruned, accumulating dead branches at the base, reminiscent of divaricating shrubs of various genera (e.g., *Coprosma*) on coastal clifftops in New Zealand.

Generation Length

The generation length of *Hibbertia truncata* is estimated to be 60 to 75 years. This is based on an estimated longevity of 40-80 years and an inferred pre-settlement fire interval of 35-75 years. Although Toelken (1998) notes that suckering has been observed, the taxon is unlikely to resprout post-fire since, like its closest relatives in the *H. aspera* complex, it is likely to have a weak root system. The predominant mode of recruitment is likely to be opportunist in response to gap creation often caused by salt spray-induced mortality of other shrubs. It is therefore more or less continuous. Pulse recruitment following rare fire events also occurs. Fire frequency and intensity in the maritime habitat of the taxon is low, since exposure to salt spray and onshore winds disperses the litter layer and elevates both fuel moisture and effective precipitation.

Distribution

The taxon is located in coastal heath, rarely further inland. It is recorded only from a few localities in the vicinity of Peterborough and Port Campbell in the south west of Victoria. In the latter area it is one of the dominant plants of local coastal vegetation. It is often common locally and conserved in Port Campbell National Park (Toelken 1998; VicFlora 2015).

Habitat

The taxon grows on sandy soil or, sometimes, on sand dunes. It is usually associated with limestone in coastal heath (Toelken 1998; VicFlora 2015).

Threats

Historically, the taxon has suffered significant decline in response to township development at Port Campbell, and habitat loss to agriculture, particularly north of the Great Ocean Road. In addition, the taxon is likely to have suffered a significant decline in population density and local extinction in response to the nearly annual fires used to create green pick for cattle grazing. Such fires were clearly well below the tolerable fire interval for the taxon.

The key current threat is inappropriate fire regimes. Differences in opinion about what constitutes the appropriate fire regime, and regimes used for different objectives (e.g., *Thelymitra epipactoides* (Metallic Sun-orchid) regeneration), further complicate management. Climate change, including an increase in severe storm events, is leading to adult mortality of both competing woody taxa and, potentially, this taxon. If coincident with post-fire recruitment, such storm events may lead to very significant density reduction or local extinction.

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 180 to 225 years is estimated to be 50 to 70% (midpoint 60%), based on (c) above.

The taxon has suffered significant decline due to land development and inappropriate fire regimes.

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 180 to 225 years is estimated to be 15 to 30%, based on (c) above.

Future decline is based on the key current threat, which is anthropogenically elevated fire frequency and intensity. The impact of imposed fire regimes is further exacerbated by climate change, including an increase in severe storm events leading to adult mortality of competing woody species as well as, potentially, this taxon. If coincident with post-fire recruitment, such storm events may lead to very significant density reduction or local extinction.

Eligible under Criterion A4 as Endangered

The population reduction over any 180 to 225 year period, including both past and future (up to 100 years in the future), is estimated to be 40 to 80% (midpoint 60%), based on (c) 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 B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 305 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally and anthropogenically at the landscape scale, at distances that are likely to exceed the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. Therefore, the probability of recolonisation, in the event of local extinction, is remote.

It is estimated to have one location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of anthropogenically elevated fire frequency and intensity exacerbated by climate change, including an increase in frequency and intensity of severe storm events.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 68 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is severely fragmented, has one location, 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 C as Vulnerable

It is estimated that there are 3,000 to 7,000 mature individuals, based on field observations. It should be noted that adult plants are often densely intertwined and interlocked, an observation which may be interpreted either as root suckers from a single genet or else as genetically distinct individuals, each of which has recruited from seed at a higher density. The true population size is, therefore, difficult to determine.

There is estimated to be a continuing decline of 15 to 30% within 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.

References

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

Toelken, H.R. (1998). Notes on Hibbertia (Dilleniaceae) 2. The *H. aspera - emptetrifolia* complex. *Journal of the Adelaide Botanic Gardens, 18*(2), 107-169.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Hibbertia truncata.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/b5d129c2-43ee-4e42-836c-2cf24634955f