Threatened Species Assessment

Alectryon subcinereus
Native Quince

Taxonomy

Alectryon subcinereus (A. Gray) Radlk.

The taxon is also known by the alternative common names Wild Quince, Smooth Rambutan (or Ramboutan) and Bird's Eye (in reference to the open fruit) (SAC 2004).

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2004).

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

Proposed conservation status

Critically Endangered in Victoria

Criteria B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(i,ii); D

Species Information

Description and Life History

The taxon is a shrub or tree to 10 m or, exceptionally, to 18 m tall, with large, divided leaves, small, green flowers and red, fleshy fruit. Leaves are alternate, paripinnate, to 20 cm long, with 2-8 leaflets. Leaflets are elliptic to ovate, alternate, to 15 cm long and 5 cm wide, usually hairless, the upper surface dark green, glossy, the lower surface paler green, margins toothed toward the apex. Flowers are borne in axillary panicles 10-15 cm long and wide. Flowers are usually unisexual, green-brown, cup-shaped, about 3 mm wide, with minute inconspicuous petals. The fruit is a green-brown, hairless, capsule, to 10 mm long and 16 mm wide, with two almost spherical lobes. The taxon flowers and fruits from September to February (Duretto 1999; SAC 2003).

Generation Length

The generation length of *Alectryon subcinereus* is inferred to be 80 to 200 years. This is inferred from a longevity that is likely to exceed 150 years. Additionally, it is inferred from the high level of protection afforded to the Dry Rainforest habitat of the taxon in Victoria, where topographic fire refuge and rocky substrates insulate the habitat from almost all fire events in the pre-settlement environment.

Distribution

The taxon is apparently restricted in Victoria to an estimated population size of 5-20 mature individuals at two sites in far East Gippsland (SAC 2003). The Stony Creek subpopulation consists of only a handful of mature canopy-height trees (estimates of several observers ranging from 4-20), as well as a few younger individuals, and the subpopulation upstream on the Genoa River is likely to comprise no more than a single tree. The Stony Creek subpopulation comprises a single cluster of individuals nearer the downstream end of the small isodiametric stand of Dry Rainforest which occupies the small gorge (SAC 2003).

The occurrence of the taxon in Stony Creek Gorge, north-west of Genoa in far East Gippsland, is well documented, with repeated collections from the site having accumulated at MEL over almost a century since 1906 (SAC 2003). Until recently, this was believed to be the only Victorian occurrence of the taxon. The Stony Creek Gorge is located 3 km north-west of Genoa, 400 m south-south-west of the Wangarabell Road crossing on Stony Creek and 600 m

upstream (east) of the confluence of Stony Creek with the Genoa River. It should be noted that three tributaries of the Genoa River in the Genoa district are each named Stony Creek, one downstream of Genoa township and two upstream (SAC 2003). The gorge occurrence of the taxon is on the Stony Creek which enters the Genoa River 3 km upstream of the township, not the Stony Creek which enters the Genoa River 7.5 km upstream (north-west) of Genoa. In October 1991, specimens were collected from a second site 5 km north-west of Genoa, less than 3 km west-north-west of the Stony Creek Gorge site. This site is in a minor gully approximately 200 m upstream and north-east of its confluence with the Genoa River (SAC 2003). The occurrence of the taxon at this second location is somewhat enigmatic, with inconsistency between the dates of first recording and collection, and field confirmation is highly desirable. The Victorian occurrence represents the southern limit of range for the taxon (SAC 2003).

Habitat

The taxon is apparently confined to two small stands of rainforest with affinities to both warm temperate and dry rainforest in fire-protected rocky gorge-like sites (Duretto 1999; SAC 2003). The occurrence at Stony Creek is situated in a small amphitheatre below a cascade recessed into a small granitic gorge on a bend in the creek where the gully changes from south- to west-trending (SAC 2003). Although the predominant aspect of the site is north to north-west, exposing the site to maximum insolation, the rocky substrate and the topographic setting provide the maximum protection from fire available at any point along Stony Creek. The rainforest at this site is codominated by *Acmena smithii* (Lilly Pilly) and *Tristaniopsis laurina* (Kanooka or Water Gum) with the vine *Cissus hypoglauca* (Jungle Grape) prominent in the canopy (SAC 2003). The distinctive topographic setting, floristic composition, diversity of climbers (ten species) and the complete absence of tree ferns align this site with the dry rainforests of the Mitchell and Snowy River catchments in central Gippsland to the west and those in the Bega valley in New South Wales to the north. This distinctive vegetation has been classified as one of only three examples of Gorges Dry Rainforest, one of two floristic communities of Dry Rainforest in Victoria (Peel 1999). The site is distinguished by the presence of a range of rare or threatened species which rely on the protection of a rainforest canopy or, directly, on the rocky substrate, for protection from fire (SAC 2003). In addition to the taxon itself, this includes the endangered *Thelychiton speciosus* (Rock Orchid) and the rare *Beyeria lasiocarpa* (Wallaby-bush or Bristle-fruited Turpentine), *Dockrillia striolata* (Streaked Rock-orchid), *Libertia paniculata* (Branching Grass-flag) and *Zieria smithii* (Sandfly Zieria) (SAC 2003).

The second occurrence is protected by a small stand of rainforest on a south-east-facing slope adjacent to a minor intermittent drainage line which runs south-west to enter the Genoa River (SAC 2003). The floristic composition of this stand and the presence, in small numbers, of two tree fern species, align this site more with the East Gippsland Foothills Warm Temperate Rainforest floristic community (Peel 1999).

Threats

The key threat to the taxon is the increasing frequency and intensity of both bushfires and planned burning. These are projected to penetrate mature rainforest in response to both climatic drying and warming and the imposition of anthropogenic fire regimes. It must be noted that the taxon is assumed to be highly fire sensitive.

The taxon has been reduced to one individual at one site and small cluster at the other site. Therefore, there is a high risk of local extinction, particularly of the upstream occurrence, in response to fire ingress into the rainforest habitat and recruitment failure in response to extreme drought stress. Additionally, the taxon is threatened by Sambar Deer browsing and antler rubbing, due to the increasing prevalence of Sambar throughout the region.

The taxon is naturally rare in Victoria with no evidence to suggest historical depletion nor any evidence to suggest that recruitment has declined or is not occurring (SAC 2003). The observed restriction of the taxon to drier rainforest types strongly suggests that the taxon is highly fire-sensitive, an observation consistent with the relatively smooth thin bark on mature trees.

The risk of bushfire is ever-present in this highly fire-prone district but this risk is exacerbated by the higher frequency of planned burning proposed for the priority 1 and 2 zone which is superimposed over the SMZ in which the upstream subpopulation is located (SAC 2003). Such fire management practices further threaten other areas in close proximity. The Special Protection Zone which purports to protect the highly significant conservation values of the Stony Creek Gorge is surrounded on all sides except the freehold land immediately to the south-east by state forest which is zoned as a priority 1 and 2 zone for planned burning (SAC 2003).

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.

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			

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Evidence:

Eligible under Criterion B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to be severely fragmented. The two populations are isolated from each other, and there is negligible capacity for recolonisation should one subpopulations become locally extinct. The potential for birds to carry seeds from one site to the other is very low and the distance between the tiny patches of dry rainforest is over 3 km apart.

It is estimated to have one location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats. There is a high, but undocumented, likelihood of adult mortality in response to extreme drought stress, Sambar browsing, antler rubbing, inappropriate fire regimes, and the possibility of recent fire ingress into the habitat of either subpopulation, resulting from human activity and climate change.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 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 1 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 C2 as Critically Endangered

The taxon is apparently restricted in Victoria to an estimated population size of 5-20 mature individuals at two sites in far East Gippsland (SAC 2003).

The number of mature individuals is inferred to continue to decline, the number of mature individuals in each subpopulation is 50 or fewer and the percentage of mature individuals in one subpopulation is 90-100%.

There is a high, but undocumented, likelihood of adult mortality in response to extreme drought stress, Sambar browsing, antler rubbing and the possibility of recent fire ingress into the habitat of either subpopulation.

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 Critically Endangered

The taxon is estimated to have 5 to 20 mature individuals.

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.

Duretto, M.F. (1999). Rubiaceae. In N.G. Walsh and T.J. Entwisle (Eds.), *Flora of Victoria Vol. 4, Cornaceae to Asteraceae*. Melbourne: Inkata Press.

Floyd, A.G. (1989). *Rainforest Trees of Mainland South-eastern Australia.* Melbourne: Inkata Press.

Peel, W.D. (1999). *Rainforests and Cool Temperate Mixed Forests of Victoria.* East Melbourne: Department of Natural Resources and Environment.

SAC (2004). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 731 *Alectryon subcinereus*. Department of Environment and Primary Industries, Victoria.

VicFlora (2020). Flora of Victoria, Royal Botanic Gardens Victoria: *Alectryon subcinereus*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/4559f7a6-609c-407a-a52e-e1177ce43b91