

Hibbertia hermanniifolia subsp. *recondita* Outcrop Guinea-flower

Taxonomy

Hibbertia hermanniifolia subsp. *recondita* Toelken

There are two subspecies but only subsp. *recondita* occurs in Victoria. Subspecies *hermanniifolia* is restricted to Bents Basin on the Nepean River, west of Sydney, New South Wales. Subspecies *hermanniifolia* is distinguished by its longer stellate hairs (stalk longer than 0.3 mm), peduncles (more than 9 mm long), and larger number of stamens (more than 18) (VicFlora 2018).

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criterion D2

Species Information

Description and Life History

The taxon is a shrub with spreading tomentose branches to c. 3 m long. Vestiture of mainly tubercle-based stellate hairs under larger stalked stellate hairs. Leaves sessile, oblanceolate-cuneate to spatulate, 4.3-15.4 mm long, 2.8-7.6 mm wide, tomentose to puberulous, discolorous, with fewer 2-4-branched stellate hairs and/or simple hairs above; apex truncate to rounded, rarely slightly emarginate; \pm folded along the midvein above; margins narrow, recurved. Flowers with peduncle to 8.2 mm long, terminal, with one leaf-like bract 1-1.5 mm long below calyx; sepals 3.5-6.8 mm long, unequal, tomentose; petals obovate to oblanceolate, 4.8-7.1 mm long, usually bright yellow; stamens 8-16 and a few staminodes surrounding ovary; filaments free; carpels 2, tomentose to almost villous. The taxon flowers from November to March (VicFlora 2018).

Generation Length

The generation length of *Hibbertia hermanniifolia* subsp. *recondita* is estimated to be 35 to 50 years. This is based on an inference from related taxa in comparable habitats that the taxon is likely to be a fire-sensitive, obligate seed regenerator, recruiting predominantly episodically post-fire at pre-settlement intervals of 35-75 years or more with some opportunistic recruitment in response to localised disturbance events and optimal seasonal conditions. The taxon is unlikely to resprout following fire and longevity is plausibly in the 15-35 (-50) year range. Recruitment is also assumed to occur primarily from a soil-stored seedbank post-fire, with some recruitment from seed released directly from follicles in the canopy of the plant in the absence of fire. Seedbank viability is unknown but seed germination of *Hibbertia* in general is fickle and unpredictable.

Distribution

The taxon is apparently confined, in Victoria, to the east (e.g. near Dargo, Mt Elizabeth, Snowy River Gorge, Pine Mountain). It is also found NSW (VicFlora 2018). The record for Pine Mountain is based on a misidentification of a specimen collected by F.E. Davies in 1988 and lodged at the Australian National Herbarium in Canberra. It was identified by the collector as *H. hermanniifolia*. The site was thoroughly searched by the assessor in 2002 in the company of the revisor of the genus, Helmut Toelken, and it was concluded that the identity of the Davies'

Hibbertia hermanniifolia subsp. *recondita*

Outcrop Guinea-flower

collection is *Asterolasia asteriscophora* subsp. *asteriscophora* (Lemon Star-bush) in the Rutaceae, which has a striking superficial resemblance to *H. hermanniifolia* in the vegetative and fruiting state and which occurs at the site.

Habitat

The taxon is apparently confined, in Victoria, to dry mountain slopes and rocky summits (VicFlora 2018).

Elliot and Jones (1990) state that, in cultivation, *H. hermanniifolia* “will grow in a range of positions from semi-shade to full sun. Good drainage is essential” and that the taxon “tolerates light to moderately-heavy frosts”.

At Mt Elizabeth, the habitat is a 3-5 m tall rocky (granodiorite) shrubland dominated by *Kunzea peduncularis* (Mountain Burgan), *Leptospermum brevipes* (Slender Tea-tree), *Callistemon pallidus* (Lemon Bottlebrush), *Pomaderris prunifolia* (Prunus Pomaderris), *Nematolepis frondosa* (Leafy Nematolepis) and *Grevillea polychroma* (Tulloch Ard Grevillea) on skeletal soil on the summit at an elevation of 925-945 m. The taxon is locally common amongst exposed rocks. Although most abundant near the summit, the stand at this site extends into the adjacent tall open forest dominated by *Eucalyptus regnans* (Mountain Ash) where it is associated with *Cassinia trinerva* (Three-nerved Cassinia) and *Goodenia ovata* (Hop Goodenia).

North-east of Dargo, the habitat is rocky, shrubby, dry, open forest at 590 m elevation in association with *Eucalyptus sieberi* (Silver-top Ash), *E. polyanthemos* (Red Box), *Acacia silvestris* (Red Wattle), *Philothea trachyphylla* (Rock Wax-flower), *Boronia anemonifolia* (Sticky Boronia), *Cassinia longifolia* (Shiny Cassinia), *Dodonaea viscosa* subsp. *cuneata* (Wedge-leaf Hop-bush), *Lasiopetalum macrophyllum* (Shrubby Velvet-bush), *Olearia phlogopappa* (Dusty Daisy-bush) and *Stypandra glauca* (Nodding Blue-lily).

Threats

The key threat to the taxon is climatic drying and warming which, together with increasing fire risk, are projected to increase the frequency of episodic post-fire recruitment from soil-stored seedbanks. Each such event exposes the recruiting cohort of seedlings and juveniles to recruitment failure in response to increasingly frequent and severe drought stress and, potentially, to targeted browsing by native and exotic herbivores including kangaroos, wallabies, goats, rabbits and, increasingly, Sambar Deer (*Rusa unicorn*). The increasing frequency, intensity and duration of extreme drought events also increases the risk of adult mortality, although the resilience of the taxon to this risk is unclear given its inferred habitat range. Collectors' notes and field observations of the assessor suggest that the taxon is restricted to exposed habitats with shallow to skeletal soils, in which case it is likely to be resilient under drought stress.

The risk of repeat fire events at intervals below the tolerable fire interval for the taxon is low, given the time required for the recorded habitat to accumulate sufficient fuel to carry intense fire.

Hibbertia hermanniifolia subsp. recondita

Outcrop Guinea-flower

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%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p> <p style="text-align: center;"><i>based on any of the following:</i></p> <ul style="list-style-type: none"> (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. There is insufficient evidence to determine whether there will be a future reduction in population size (Criterion A3).

Hibbertia hermanniifolia subsp. recondita

Outcrop Guinea-flower

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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 809 km² and the Area of Occupancy (AoO) is estimated to be 44 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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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

Hibbertia hermanniifolia subsp. *recondita*

Outcrop Guinea-flower

There is no available estimate of population size for the taxon in Victoria since no collector has recorded population size at any collection site, and there is no estimate of numbers at the only population monitoring site for the taxon.

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 km ² or number of locations ≤ 5 [Ⓜ]

Evidence:

Eligible under Criterion D2 as Vulnerable

The taxon is estimated to be very restricted. The taxon has a restricted distribution, occurring in a single location, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations. This is in response to the impact of the identified long term threats, notably climatic drying and warming, and increased fire risk.

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
- Elliot, W.R. and Jones, D.L. (1990). *Encyclopaedia of Australian plants suitable for cultivation*. Volume 5. Lothian Publishing, Melbourne.
- VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Hibbertia hermanniifolia* subsp. *recondita*. Retrieved from: <https://vicflora.rbv.vic.gov.au/flora/taxon/f33c1b42-b812-489e-820e-078ba5332e42>