



Hakea dactyloides Finger Hakea

Taxonomy

Hakea dactyloides (Gaertn.) Cav.

Hakea dactyloides under its present circumscription is a complex involving at least 3 species, extending from far south-eastern Victoria to south-eastern Queensland (VicFlora 2019).

Although Barker, Barker and Haegi describe the polymorphic taxon in the 1996 Flora of Victoria Volume 3 account adopted for VicFlora (1999) as an erect lignotuberous bushy shrub or small tree 2.4-4.5 m high, in their 1999 Flora of Australia account (Barker, Haegi and Barker 1999) *Hakea dactyloides* is described as an erect single-stemmed nonsprouting shrub or small tree, 2.4-4.5 m tall in contrast to *Hakea laevipes* which is an erect bushy much-branched resprouting lignotuberous shrub 0.3-3 m tall. *H. laevipes* is endemic to NSW and south-eastern Queensland.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The taxon is an erect lignotuberous bushy shrub or small tree 2.4-4.5 m high; branchlets glabrescent or sparsely appressed-pubescent at flowering. Leaves narrowly elliptic to almost linear, rarely narrowly obovate, sometimes falcate, 4-13 cm long, 8-30 mm wide, apex acute to acuminate; longitudinal veins 3, usually more prominent on lower surface. Inflorescence 20-30-flowered; pedicel appressed-pubescent; perianth white, glabrous; pistil 4.0-4.5 mm long; pollen presenter conical. Fruit obliquely elliptic, slightly curved, 2.5-3.5 cm long, 1.7-2.3 cm wide, not beaked; horns lacking; seed not occupying whole valve face, obliquely obovate, 18-23 mm long; wing extending only down one side of body. The taxon flowers September to December (VicFlora 2019).

At Stony Peak Road south-west of Genoa, Whalen describes the taxon as a tree to 7 m tall with a rounded crown and very floriferous with white flowers.

Generation Length

The generation length of *Hakea dactyloides* is estimated to be 50 to 90 years. An estimate of generation length is based on the single-stemmed nonsprouting habit of the taxon (Barker, Haegi and Barker 1999), its inferred inability to resprout following fire since it lacks a lignotuber and the expectation that most seed recruitment occurs episodically following rare fire events at plausible pre-settlement fire intervals of 50-90 years or more.

Distribution

The taxon is confined in Victoria to the far east, and there rather rare at, for example, Mt Kaye, Mallacoota area and Howe Range (VicFlora 2021). It is reliably recorded at only five Victorian sites, namely Mt Kaye, Noorinbee



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North 5 km south of Mt Kaye, Stony Peak Road south-west of Genoa and two sites east of Mallacoota Inlet - Howe Hill and a site south of Mt Carlyle near the New South Wales border.

A 1909 collection purporting to have been taken "west of the entrance to Mallacoota Inlet", although misplotted in the AVH to the north-east shore of the inlet, suggests the taxon occurred somewhere in the vicinity of Mallacoota township over a century ago. If the location is correctly interpreted, this occurrence is likely to have become locally extinct since it has not been confirmed in a century of close settlement and natural history observation.

Habitat

The taxon occurs on rocky ridges and peaks (VicFlora 2021). Wakefield notes the habitat of the Mt Kaye occurrence as Mt Kaye Granites. Albrecht describes the habitat of the Noorinbee North occurrence as a granite massif where the taxon is on a large granite outcrop on a north-west facing spur in association with *Kunzea ambigua*, *Platysace lanceolata*, *Stypandra glauca*, *Boronia anemonifolia*, *Xanthosia tridentata* and *Leucopogon attenuatus* at an elevation of 550 m. Beaglehole records the taxon as occurring on Howe Hill which can be inferred to be on an elevated granitic substrate. Whalen describes the habitat on the Stony Peak Road as *Eucalyptus sieberi* forest with *Goodenia ovata*, *Daviesia latifolia*, *Leptomeria acida* and *Pteridium esculentum*. The substrate is likely to be granitic. Albrecht and Walsh record the taxon as occasional on a small granite outcrop on a ridge 700 m due south of the summit of Mt Carlisle where associated with *Eucalyptus sieberi*, *Hakea eriantha*, *Cassinia longifolia*, *Pultenaea hispidula*, *P. daphnoides* and *Correa reflexa* at an elevation of 320 m. Nearby, Walsh records the taxon as forming a dense stand of straggling open shrubs (to 3 m) in what appears to be a fire regeneration area on a dry, granitic knob on a spur falling to the south-east, 2 km south-east of Mount Carlyle in the Howe Range where surrounded by dense *Allocasuarina littoralis* regeneration at an elevation of 160 m. It is unclear whether this stand is a continuation of the stand closer to Mt Carlisle or a distinct subpopulation.

Threats

The taxon is unlikely to have suffered any significant historic decline through habitat loss to agriculture since the elevated granitic habitat of the taxon is unsuitable for grazing or cropping and of marginal value for timber production. An occurrence in the vicinity of Mallacoota township may have become locally extinct through township development or local infrastructure development such as aerodrome construction.

Whilst four of the five extant occurrences are now protected with the Coopracambra and Croajingolong National Parks, the Stony Peak Road occurrence is in State Forest where it is potentially threatened by forestry operations, road management and fuel reduction burning activity.

The taxon is threatened by decreasing rainfall, increased evaporation and extreme temperature, increasing intensity, frequency and duration of drought, increasing frequency and intensity of fire and unseasonal prescribed fire (especially in winter). Acting synergistically, these threats increase the risk of adult mortality, recruitment failure, decreasing flowering and seed set and local extinction.

Given that Victorian occurrences of the broadly circumscribed *H. dactyloides* (VicFlora 2021) are strictly non-lignotuberous and therefore interpretable as an obligate seed regenerator, the taxon, in its strict sense, is particularly susceptible to recruitment failure and local extinction in response to the impacts of intense browsing, particularly of recruiting stands, adult and juvenile mortality in response to intense drought stress and the increasing risk of repeat fire events at intervals approaching or below the tolerable fire interval for the taxon.

The taxon is also threatened by targeted browsing and antler rubbing by Sambar which is currently undergoing an explosive increase in population density across the East Gippsland region. As a member of the Proteaceae, the taxon may also be susceptible to infection by *Phytophthora cinnamomi*. (Cinnamon Fungus).

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>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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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 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:

Eligible under Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 450 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the landscape scale with geographically isolated occurrences separated at distances greatly exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. Winged seed are released from an elevated seedbank within the crown of adult individuals and fall to the ground under the influence of gravity and any air currents, typically immediately after fire when assisted to germinate by the ash bed effect. Passive dispersal operates at the metre scale only. This precludes the opportunity for recolonisation in the event of local extinction

It is estimated to have 1 location. It has a continuing decline in (iii) above in response to the current and projected impact of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 20 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it severely fragmented, has 1 location and has a continuing decline in (iii) above.

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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 as Data Deficient

There is no available estimate of population size for the taxon in Victoria, the only inference regarding population size being a comment that the taxon is occasional at one site south of Mt Carlyle and forming a dense stand in a fire regeneration area at a nearby site.

Criterion D. Very small or restricted populations		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.

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

References

Barker, R.M., Haegi, L. and Barker, W.R. (1999) *Hakea*, *Flora of Australia* Volume 17B: 133-134. Melbourne: ABRS/CSIRO Australia.



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