Threatened Species Assessment

Asplenium decurrens
Shore Spleenwort

Taxonomy

Asplenium decurrens Willd.

This species was previously included within the similar coastal species, *Asplenium obtusatum* G.Forst. as subsp. *northlandicum* Brownsey. It has narrower scales and larger spores than *A. obtusatum*. The larger spores in *A. decurrens* is assumed to be indicative of this species being a higher ploidy than *A. obtusatum*, given that a New Zealand plant currently included in *A. decurrens* has an octoploid chromosome count, whereas *A. obtusatum* is tetraploid. *A. decurrens* was shown by nuclear DNA sequence data to be most likely an allooctoploid with *A. obtusatum* and another unidentified species as its parents. It is general practice in fern taxonomy to recognise allopolyploids at species rank, which is why it is here recognised as a separate species. This species has previously been recognised in New Zealand as *A. northlandicum* (Brownsey) Ogle, but *A. decurrens* is the earlier name for this species under its current circumscription and takes priority. There are subtle differences between Australian and New Zealand plants currently included in *A. decurrens*, such as fenestrate spores in Australian plants and differences in chloroplast DNA sequences. Consequently, whether New Zealand plants should continue to be treated as conspecific with Australian *A. decurrens* requires confirmation.

The taxon hybridises with *A. flaccidum* on Wilsons Promontory and adjacent islands. Early reports of these putative hybrids were misidentified as *A. scleroprium* Hombron (which, interestingly, can only be easily separated from hybrids between the *A. obtusatum* complex and *A. flaccidum* by its fertile spores). *Asplenium decurrens* reportedly also hybridises with *A. bulbiferum* (e.g. Flinders Island) (VicFlora 2020).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A2ce+3ce+4ce; B2ab(ii,iii,iv,v); C2a(i)

Species Information

Description and Life History

The taxon is a herbaceous tufted fern with a short, thick rhizome covered with shiny purplish-brown, translucent scales tapering to long, fine points. Fronds clustered, erect, 8-60 cm long; scales at base of frond similar to those on rhizome, smaller scales scattered on rachis and midveins, particularly on ventral surface, sometimes bubble-like. Stipe fleshy, green above, brown and flat towards base, groove developing towards lamina; old stipe bases persistent. Lamina once pinnate, oblong, thick, tough and fleshy, dull green; rachis grooved with raised central rib continuing as raised midvein of terminal pinna. Pinnae shortly stalked, 4-15 pairs, oblong to ovate, mostly 15-65 mm long, sometimes lobed near base; base asymmetrically wedge-shaped, decurrent on edge or rachis; margins bluntly toothed, thickened; apex blunt to acute; midvein raised, others obscure. Sori linear-oblong, oblique to midvein, not reaching margin; indusium oblong, opening towards midrib (VicFlora 2020).

Generation Length

The generation length of *A. decurrens* is inferred to be 30 to 50 years. Longevity is plausibly about 30 years or more. Recruitment is likely to be continuous from air-borne spores only but the recruitment rate is suspected to be

very low. The habitat is very limited, and there is no information on the number of recruits per annum or their percentage of survival.

Distribution

The taxon occurs along the Victorian coast from Phillip Island, islands near Wilsons Promontory and Rame Head and Gabo Island in far East Gippsland, with a disjunct western outlier at Lady Julia Percy Island near Port Fairy (VicFlora 2020). The occurrence at Cape Woolamai on Phillip Island was always very small and may now be locally extinct since it has not been confirmed since the last collection in 1976. In 1996 the taxon was recorded at Altona in the Point Cook Coastal Park. In East Gippsland the taxon has been reliably recorded at Point Hicks, Rame Head, Little Rame Head and Gabo Island.

Habitat

The taxon usually grows among coastal rocks in seepage zones within reach of salt spray, but also sheltered in coastal scrub. It occurs mostly on granite, but also on basalt at Lady Julia Percy Island (VicFlora 2020).

Threats

Key threats to the taxon include climate change resulting in declining rainfall, rising sea level and increasing frequency of storm events and coastal instability, leading to decline in habitat quality and both adult mortality and recruitment failure. Some sites may also be threatened by weed invasion, especially by *Coprosma repens* (Mirror Bush).

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 90 to 150 years is projected to be 30 to 50%, based on (c) and (e) above.

This is based primarily on the inferred impact of the severe drought between 1990 and 2008 and the likely impact of the 1998 Boxing Day storm event associated with the Sydney to Hobart yacht race on subpopulations east of Rame Head in East Gippsland, both events resulting in adult mortality and recruitment failure.

Eligible under Criterion A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 40 to 80% (midpoint 60%), based on (c) and (e) above.

An estimate of future decline is based on the projected impact of the identified threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is suspected to be 40 to 80% (midpoint 60%), based on (c) and (e) 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 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 Victorian Biodiversity Atlas.

The taxon is inferred to be severely fragmented, due to populations being small and isolated, therefore they may be subject to rapid climate change or stochastic events.

It is estimated to have a continuing decline in (ii), (iii), (iv) and (v) above, based on the key threats of weed invasion and declining rainfall due to climate change.

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 Endangered

It is estimated that there are 500 to 1,000 mature individuals. There is very limited habitat in any location, very few sites and subpopulations are always small.

There is an estimated continuing decline, and the number of mature individuals in the largest subpopulation is 400.

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 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

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne.

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Asplenium decurrens.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/51f93944-c29d-4763-b2a3-cb2f4b8932bf