Threatened Species Assessment

Deparia petersenii subsp. *congrua*
Japanese Lady-fern

Taxonomy

Deparia petersenii subsp. *congrua* (Brack.) M. Kato

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 A2ace+3ce+4ace; B2ab(i,ii,iii,iv,v); C1+2a(i)

Species Information

Description and Life History

Rhizome creeping, covered in scales. Fronds relatively close together, erect, 30-80 cm tall. Stipe about equal in length to lamina, fleshy when young, dark green to brown, flattened on upper surface, grooved; scales narrow, pale brown, numerous near base, scattered above; hairs sometimes present. Lamina 1-2-pinnate, oblong to narrowly triangular, mid-green to dark green, with short, soft hairs on upper surface of rachis, veins and veinlets; rachis groove not continuous with groove of lamina midrib. Primary pinnae shortly stalked or sessile, lobed to pinnate; lobes broadly oblong to deltoid, margins crenate to shallowly toothed, apices blunt; veins simple or forked. Sori obliquely angled to mid-vein, linear-oblong, basal sori sometimes paired; indusium membranous, more or less flat (not inflated or arched), opening to leave toothed or irregularly torn margin VicFlora (no date).

Generation Length

The generation length of *Deparia petersenii* subsp. *congrua* is estimated to be 6 to 20 years. This is a medium sized fern that can grow 30-80 cm tall and so it is expected that it may reach maturity in around 6 years on average. Other species in its family, Athyriaceae, are known to grow in cultivation for at least 50 years (Dyer 2013). In the wild where they are not cared for and susceptible to drought and flood damage, they may live for around 20 years on average.

Distribution

In Victoria the taxon occurs at the Wabonga Plateau, Strezlecki Ranges, and East Gippsland east from Buchan.

Habitat

The taxon occurs on river flats and shaded rock faces in wet sclerophyll and warm-temperate rainforest.

Threats

The bushfires of 2019/2020 are believed to have potentially impacted between 50 to 80% of the taxon's habitat. The taxon is sensitive to fire and is likely to have been significantly impacted.

Typical of most fern species, this plant is reliant on moist habitats to survive. As a result drought has the potential of reducing soil moisture and is a major threat. Fire which kills plants and is not needed for their recruitment is also

a threat. The creekside habitat of this species also makes it vulnerable to being dislodged by floods after severe storm events. Weed infestation is also a threat at several sites where they may exclude the taxon.

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 60 to 150 years is estimated to be 30 to 50% (midpoint 45%), based on (a), (c) and (e) above.

The higher numbers in the past compared to current are a result of some populations being known to contain more individuals (e.g. Black Hole, Traralgon Creek) or not being subjected to weed infestation (Little Paradise Falls).

Eligible under Criterion A3 as Endangered

The population reduction over the next 60 to 100 years is projected to be 30 to 80% (midpoint 50%), based on (c) and (e) above.

This is based on likely extinctions at sites that have a small population size (Black Hole), are weed infested or are more susceptible to drought (i.e. Little Paradise Falls) and subpopulations in the Strzelecki Ranges that are susceptible to flood damage.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 300 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 90% (midpoint 60%), based on (a), (c) and (e) above.

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 43 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented. Most subpopulations are small and several are disjunct from the closest subpopulation (e.g. over 50 km). Considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them, the subpopulations can be considered to be severely fragmented

It is estimated to have 5 locations. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above. Threats are ongoing at some sites where this species occurs (dry conditions, flood events, weed infestation).

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 C1 as Endangered

It is estimated that there are 240 to 570 mature individuals. Comments on the abundance of this species when they are provided on herbarium specimens indicate that this species is generally not common where it occurs. At two sites it is most likely extinct (Traralgon Creek and Black Hole). Two plants remained in 1989 at Traralgon Creek and this species was not located by the assessor on Harrisons Creek in Black Hole. Estimates of 0 to 2 and 0 to 10 are given for these two subpopulations. The largest subpopulation, based on the description of "fairly plentiful" is on the upper part of the Combienbar River, and may be of the order of 60 to 100. The subpopulation on the Murrindal River between the Basin and the Murrindal Bridge also seems to extend a reasonable distance and may also contain this number of plants. All other subpopulations are assumed to contain between 10 and 30 mature individuals.

There is an estimated continuing decline of 20 of 50% within two generations.

Eligible under Criterion C2 as Endangered

It is estimated that there are 240 to 570 mature individuals. The number of mature individuals is estimated to continue to decline, and the number of mature individuals in each subpopulation is fewer than 250.

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 have 240 to 570 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.

Dyer, A. (2013). What is the natural life-span of a fern? *Pteridologist* 5.6. 460-464.

VicFlora (no date). Flora of Victoria, Royal Botanic Gardens Victoria: *Deparia petersenii* subsp. *congrua* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/f794ac3a-11fb-4a2b-94f0-8aa5e855a4b0