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Notice and reasons for the Final Determination

The NSW Threatened Species Scientific Committee, established under the Biodiversity Conservation Act 2016 (the Act), has made a Final Determination to list the shrub *Homoranthus floydii Craven & S.R.Jones* as a VULNERABLE SPECIES in Part 3 of Schedule 1 of the Act. Listing of Vulnerable species is provided for by Part 4 of the Act.

Summary of Conservation Assessment

Homoranthus floydii was found to be eligible for listing as Vulnerable under Clause 4.3 (b) (d) (e iii) and Clause 4.5 (c). The main reasons for this species being eligible are: (i) it has a restricted geographic distribution; (ii) it occurs in a limited number of threat-defined locations; (iii) there is inferred continuing decline in habitat quality as a result of frequent fire at some locations; and (iv) the species has a low total number of mature individuals.

The NSW Threatened Species Scientific Committee has found that:

1. *Homoranthus floydii* Craven & S.R.Jones (Myrtaceae) was described by Harden (2002, p.219) as "Sparse, erect shrub to 1.5 m high; glabrous. Leaves laterally compressed, narrow-elliptic to oblanceolate, incurved, usually 5–10 mm long, 1–1.5 mm thick, <0.3 mm wide; subsessile. Flowers solitary or in pairs on undifferentiated branches, yellow to reddish; peduncle 9–16 mm long; bracteoles 7.5–9 mm long, caducous. Hypanthium obconical, 7–8 mm long, 5-ribbed, glabrous or rarely with multicellular trichomes between the ribs in the lower half. Sepals 1.5–3 mm long, apex long-acuminate, not lobed. Petals broad-elliptic or broad-obovate 1.3–2 mm long, margins entire. Style 8.5–9 mm long. Flowers Aug. and Sept."

2. *Homoranthus floydii* is endemic to New South Wales. The species is known only from the Glenreagh/Kremnos area near Coffs Harbour in northeast NSW, where it grows in areas of shrubby dry sclerophyll forest to woodland on steep slopes and plateaus with shallow sandy soils formed from Kangaroo Creek Sandstone. Common canopy trees in its habitat include *Eucalyptus pyrocarpa, Corymbia gummifera, E. planchoniana* and *E. baileyana,* over a diverse understorey of smaller trees and shrubs that may include *Angophora robur*, *Leptospermum trinervium, Banksia oblongifolia, Lambertia formosa, Leptospermum polygalifolium, Xanthorrhoea* sp. and *Monotoca scoparia*. Groundcover species include *Caustis blakei, Lomandra glauca* and *Ptilothrix deusta*. The current known population of *Homoranthus floydii* includes records from Sherwood Nature Reserve and Tallawudjah Nature Reserve and from private lands to the north of these reserves.

3. The geographic distribution of *Homoranthus floydii* is highly restricted. Current known records of the species indicate an area of occupancy of 48 km^2 based on 2 x 2 km grid cells, the spatial scale of assessment recommended by IUCN (2019). The extent of occurrence (EOO) for the species is estimated to be 116 km^2.

4. Based on compiled past records and recent surveys for the species across its known range, *Homoranthus floydii* has a small population, with a low total number of mature individuals. Known records occur across a small number of locations.

5. The primary threat to *Homoranthus floydii* is adverse fire regimes. It is a long-lived but fire-sensitive shrub and appears to be an obligate seeder; adult plants are killed by fire and its seedlings establish from the soil seedbank in large numbers after fire (Sheringham *in litt.* Feb 2020, July 2021). The primary juvenile period for *H. floydii* appears to be at least 3 years, and the species and its habitat are likely to require minimum inter-fire intervals of at least 7 years, with recurrent fires at frequencies less than this likely to cause declines in populations of fire-sensitive species (Kenny *et al*. 2004). Fire history data for the last 20 years (DPIE 2021) across known *H. floydii* records indicate that the species occurs in areas with a range of burning regimes. Some locations have experienced recurrent fire intervals of 5 years or less, and Sheringham (*in litt.* Feb 2020) reported that frequent fire is leading to decline of habitat quality in at least one location. Recurrent fires at intervals of less than 3 years are likely to result in local extinctions of the species.

6. Other ongoing threats include disturbances associated with road works through known subpopulations, and modification and clearing of suitable habitat outside conservation reserves (Sheringham *in litt.* July 2021, Sept 2021). 'Clearing of native vegetation' and 'High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition' are listed as Key Threatening Processes under the Act.

7. *Homoranthus floydii* Craven & S.R.Jones is not eligible to be listed as an Endangered or Critically endangered species.

8. *Homoranthus floydii* Craven & S.R.Jones is eligible to be listed as a Vulnerable species as, in the opinion of the NSW Threatened Species Scientific Committee, it is facing a high risk of extinction in Australia in the medium-term future as determined in accordance with the following criteria as prescribed by the Biodiversity Conservation Regulation 2017:

Assessment against NSW Biodiversity Conservation Act criteria

The Clauses used for assessment are listed below for reference.

Overall Assessment Outcome:
Homoranthus floydii was found to be Vulnerable under Clause 4.3 (b) (d) (e iii) and Clause 4.5 (c).

Clause 4.2 – Reduction in population size of species
(Equivalent to IUCN criterion A)
Assessment Outcome: Data Deficient.

(1) - The species has undergone or is likely to undergo within a time frame appropriate to the life cycle and habitat characteristics of the taxon:			
	(a)	for critically endangered species	a very large reduction in population size, or
	(b)	for endangered species	a large reduction in population size, or
	(c)	for vulnerable species	a moderate reduction in population size.
(2) - The determination of that criteria is to be based on any of the following:			
	(a)	direct observation,	
	(b)	an index of abundance appropriate to the taxon,	
	(c)	a decline in the geographic distribution or habitat quality,	
	(d)	the actual or potential levels of exploitation of the species,	
	(e)	the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.	

Clause 4.3 - Restricted geographic distribution of species and other conditions
(Equivalent to IUCN criterion B)
Assessment Outcome: Vulnerable under Clause 4.3 (b)* (d) (e iii).
* Although *Homoranthus floydii* meets the thresholds for highly restricted geographic distribution (EOO and AOO) for an endangered species, two of the three other required conditions are only met at the vulnerable level.

The geographic distribution of the species is:				
	(a)	for critically endangered species		very highly restricted, or
	(b)	for endangered species		highly restricted, or
	(c)	for vulnerable species		moderately restricted,
and at least 2 of the following 3 conditions apply:				
	(d)	the population or habitat of the species is severely fragmented or nearly all the mature individuals of the species occur within a small number of locations,		
	(e)	there is a projected or continuing decline in any of the following:		
		(i)	an index of abundance appropriate to the taxon,	
		(ii)	the geographic distribution of the species,	
		(iii)	habitat area, extent or quality,	

		(iv)	the number of locations in which the species occurs or of populations of the species,
	(f)	extreme fluctuations occur in any of the following:	
		(i)	an index of abundance appropriate to the taxon,
		(ii)	the geographic distribution of the species,
		(iii)	the number of locations in which the species occur or of populations of the species.

Clause 4.4 - Low numbers of mature individuals of species and other conditions
(Equivalent to IUCN criterion C)
Assessment Outcome: Not met.

The estimated total number of mature individuals of the species is:						
	(a)	for critically endangered species			very low, or	
	(b)	for endangered species			low, or	
	(c)	for vulnerable species			moderately low,	
and either of the following 2 conditions apply:						
	(d)	a continuing decline in the number of mature individuals that is (according to an index of abundance appropriate to the species):				
		(i)	for critically endangered species		very large, or	
		(ii)	for endangered species		large, or	
		(iii)	for vulnerable species		moderate,	
	(e)	both of the following apply:				
		(i)	a continuing decline in the number of mature individuals (according to an index of abundance appropriate to the species), and			
		(ii)	at least one of the following applies:			
			(A)	the number of individuals in each population of the species is:		
				(I)	for critically endangered species	extremely low, or
				(II)	for endangered species	very low, or
				(III)	for vulnerable species	low,
			(B)	all or nearly all mature individuals of the species occur within one population,		
			(C)	extreme fluctuations occur in an index of abundance appropriate to the species.		

Clause 4.5 - Low total numbers of mature individuals of species (Equivalent to IUCN criterion D)
Assessment Outcome: Vulnerable under Clause 4.5 (c).

The total number of mature individuals of the species is:			
	(a)	for critically endangered species	extremely low, or
	(b)	for endangered species	very low, or
	(c)	for vulnerable species	low.

Clause 4.6 - Quantitative analysis of extinction probability (Equivalent to IUCN criterion E)
Assessment Outcome: Data Deficient.

The probability of extinction of the species is estimated to be:			
	(a)	for critically endangered species	extremely high, or
	(b)	for endangered species	very high, or
	(c)	for vulnerable species	high.

Clause 4.7 - Very highly restricted geographic distribution of species– vulnerable species (Equivalent to IUCN criterion D2)
Assessment Outcome: Not met.

For vulnerable species,	the geographic distribution of the species or the number of locations of the species is very highly restricted such that the species is prone to the effects of human activities or stochastic events within a very short time period.

Dr Anne Kerle
Chairperson
NSW Threatened Species Scientific Committee

Supporting Documentation:

Turner K (2021). Conservation Assessment of *Homoranthus floydii* Craven & S.R.Jones (Myrtaceae). NSW Threatened Species Scientific Committee.

References

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