

# NSW Threatened Species Scientific Committee

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## Notice of Preliminary Determination

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Preliminary Determination to support a proposal to list *Eucalyptus tetrapleura* L.A.S.Johnson as an ENDANGERED SPECIES in Part 2 of Schedule 1 of the Act, and, as a consequence, to omit reference to *Eucalyptus tetrapleura* L.A.S.Johnson in Part 3 of Schedule 1 (Vulnerable Species). Listing of Endangered species is provided for by Part 4 of the Act.

### How to make a submission

The NSW TSSC welcomes public involvement in the assessment process and places preliminary determinations on public exhibition on the NSW TSSC pages on the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) website. This public exhibition provides an opportunity for the public to comment on this preliminary determination as well as provide any additional information that is relevant to the assessment.

Postal submissions regarding this Preliminary Determination may be sent to:  
Secretariat  
NSW Threatened Species Scientific Committee  
Locked Bag 5022  
Parramatta NSW 2124.

Email submissions in Microsoft Word or PDF formats to:  
[scientific.committee@environment.nsw.gov.au](mailto:scientific.committee@environment.nsw.gov.au)

Submissions close 27 May 2026

### What happens next?

After considering any submissions received during the public exhibition period the NSW TSSC will make a Final Determination and a notice will be placed on the NSW DCCEEW website to announce the outcome of the assessment. If the Final Determination is to support a listing, then it will be added to the Schedules of the Act when the Final Determination is published on the legislation website. [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au).

### Privacy information

The information you provide in your submission may be used by the NSW TSSC in the assessment to determine the conservation status and listing or delisting of threatened or extinct species, threatened populations and threatened or collapsed ecological communities or to assess key threatening processes.

The NSW TSSC may be asked to share information on assessments with NSW Government agencies, the Commonwealth Government and other State and Territory governments to collaborate on national threatened species assessments using a common assessment method and to assist in the management of species and ecological communities.

## NSW Threatened Species Scientific Committee

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If your submission contains information relevant to the assessment it may be provided to state and territory government agencies and scientific committees as part of this collaboration.

**If you wish your identity and personal information in your submission to be treated as confidential you must:**

- *request your name be treated as confidential, and*
- *not include any of your personal information in the main text of the submission or attachments so that it can be easily removed.*

Professor Angela Moles, FRSN  
Chairperson  
NSW Threatened Species Scientific Committee

# NSW Threatened Species Scientific Committee

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**Publication exhibition period: 27/02/2026- 27/05/2026**

## **Preliminary Determination**

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Preliminary Determination to support a proposal to list *Eucalyptus tetrapleura* L.A.S.Johnson as an ENDANGERED SPECIES in Part 2 of Schedule 1 of the Act, and, as a consequence, to omit reference to *Eucalyptus tetrapleura* L.A.S.Johnson in Part 3 of Schedule 1 (Vulnerable Species). Listing of Endangered species is provided for by Part 4 of the Act.

## **Summary of Conservation Assessment**

*Eucalyptus tetrapleura* L.A.S.Johnson was found to be Endangered in accordance with the following provisions in the *Biodiversity Conservation Regulation 2017*: Clause 4.3(b)(d)(e i,iii) because: 1) it has a highly restricted geographic distribution with an extent of occurrence of 1,873 km<sup>2</sup> and an area of occupancy of 416 km<sup>2</sup>; 2) it occurs in a single threat-defined location; and 3) continuing decline in the number of mature individuals and the area, extent and quality of habitat is estimated due to habitat clearing, fragmentation and degradation and inferred due to genetic swamping from interspecific hybridisation as a consequence of increased habitat fragmentation and adverse fire regimes (particularly high frequency fire and high severity fire).

The NSW Threatened Species Scientific Committee has found that:

1. *Eucalyptus tetrapleura* L.A.S.Johnson (family Myrtaceae) is described as a “tree to 30 m high; bark persistent throughout, grey-black to grey-brown, 'ironbark'. Juvenile leaves disjunct, broad-lanceolate to ovate, dull green. Adult leaves disjunct, lanceolate to broad-lanceolate, 12–20 cm long, 1.5–3 cm wide, green, dull, concolorous. Conflouescence compound; umbellasters 7-flowered; peduncle narrowly flattened or angular, 15–30 mm long; pedicels 4-angled, 8–12 mm long. Buds fusiform, 10–13 mm long, 4–5 mm diam., scar present; calyptra conical, shorter and narrower than the 4-angled hypanthium. Outer stamens infertile; anthers cuboid. Fruit conical or pyriform, 4–5-locular, 4-angled, 8–10 mm long, 6–8 mm diam.; disc depressed; valves enclosed” (Hill 1991).
2. *Eucalyptus tetrapleura* is endemic to a small area around Grafton on the North Coast of New South Wales (NSW) (Rutherford *et al.* 2019), which is within the South Eastern Queensland bioregion (Commonwealth DCCEEW 2012). It is bounded roughly by the Clarence River in the north, Bookam in the east, Chambigne in the west, and Kremnos in the south. The distribution of *E. tetrapleura* occurs on the traditional lands of the Gumbaynggirr and Yaegl peoples (AIATSIS 1996; Native Land Digital 2024; Clarence Valley Council 2025).
3. The area of occupancy (AOO) is estimated to be 416 km<sup>2</sup> and was calculated using 2 x 2 km grid cells, the scale recommended by IUCN (2024). The extent of occurrence (EOO) was calculated at 1,873 km<sup>2</sup> and is based on a minimum convex polygon enclosing cleaned mapped occurrences of the species, the method of assessment recommended by IUCN (2024). Both EOO and AOO exclude records

## NSW Threatened Species Scientific Committee

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north of the Clarence River, consistent with a recent study that found all stands north of the Clarence River were entirely of hybrid origin (Rutherford *et al.* 2019). If records north of the Clarence River are included, the EOO would be 2,903 km<sup>2</sup> and the AOO 496 km<sup>2</sup>.

4. *Eucalyptus tetrapleura* occurs in a single known subpopulation, as per the IUCN (2024) definition. Genetic analysis has shown that *E. tetrapleura* has extensive gene flow across its distribution, resulting in an absence of distinct provenances (ReCER 2017).
5. Rutherford *et al.* (2019) undertook sampling at 22 sites from across the known distribution of *Eucalyptus tetrapleura* for genomic analyses. Of 169 samples that were collected in the field as *E. tetrapleura*, 104 samples were found to be 'pure' *E. tetrapleura* with the remainder mostly being hybrids with *E. siderophloia* and *E. fibrosa* (Rutherford *et al.* 2019). All samples collected as *E. tetrapleura* from an area stretching along the Pacific Highway between Glenugie and Dirty Creek south of Grafton were assigned as pure *E. tetrapleura* in these genetic analyses (Rutherford *et al.* 2019). In this area alone, which includes large areas of Glenugie State Forest (SF) and Newfoundland SF, it is estimated that there are no fewer than 10,000 mature individuals of *E. tetrapleura* present (G. Phillips pers. comm. February 2025). Previous estimates based on morphology and predictive mapping have put the population as high as 170,000–250,000 individuals (Woolgoolga to Ballina Planning Alliance 2012), although this figure is likely to include hybrids (A. Carty *in litt.* January 2025).
6. *Eucalyptus tetrapleura* typically occurs in open forest or woodland, on moderately fertile sandstone to clay soils, often in topographically lower areas (Hill 1991; OEH 2023). Commonly co-occurring species may include *E. tereticornis*, *E. siderophloia*, *E. fibrosa*, *E. bancroftii*, *E. tindaliae*, *E. umbra*, *Corymbia henryi*, *C. variegata*, *C. gummifera*, *Alphitonia excelsa*, *Allocasuarina littoralis*, and *Acacia leiocalyx* (RBGDT 2024; BioNet 2025).
7. The fire response of *Eucalyptus tetrapleura* has not been documented. The species produces a lignotuber (Slee *et al.* 2020) but is thought to be predominantly a seed-based regenerator with some capacity for resprouting (R. Kooyman *in litt.* January 2025). Based on Nicolle (2006) the species is classified as a combination sprouter, resprouting after fire or other major disturbances both basally from a lignotuber and epicormically. Many eucalypts are post-disturbance recruiters with most species classified as facultative resprouters – species which resprout after crown-scorching fire, and with seedling recruitment also maximised following a disturbance such as fire (Vivian *et al.* 2008). Being a combination sprouter, it is inferred that *E. tetrapleura* displays this response.
8. *Eucalyptus tetrapleura* is threatened by habitat clearing, fragmentation, and degradation, adverse fire regimes (particularly high frequency and high severity fire), and genetic swamping from interspecific hybridisation as a consequence of increased habitat fragmentation. '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.

## NSW Threatened Species Scientific Committee

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9. *Eucalyptus tetrapleura* occurs at a single estimated threat-defined location, as per the IUCN (2024) definition. The most serious plausible threat resulting in the lowest number of locations for the species is genetic swamping from interspecific hybridisation as a consequence of increased habitat fragmentation. Hybridisation has been found to be occurring across the majority of the species' range (Rutherford *et al.* 2019).
10. Continuing decline in the number of mature individuals and the area, extent and quality of habitat is estimated due to habitat clearing, fragmentation and degradation and inferred due genetic swamping from interspecific hybridisation as a consequence of increased habitat fragmentation and adverse fire regimes (particularly high frequency fire and high severity fire).
11. *Eucalyptus tetrapleura* is currently at high risk of timber harvesting in state forests that are actively harvested. Forest (2021) documented the loss of several *E. tetrapleura* in Pine Brush State Forest in 2005 after road widening activities were undertaken for forestry operations. The species has also been harvested in Newfoundland State Forest (Forest 2021). Road upgrades have also resulted in the loss of *E. tetrapleura* and the clearing and fragmentation of habitat. The Pacific Highway – Woolgoolga to Ballina Upgrade resulted in the removal of ~50 ha of mapped habitat and an estimated 7,274 individuals (Woolgoolga to Ballina Planning Alliance 2012).
12. *Eucalyptus tetrapleura* is likely to be threatened by genetic swamping through hybridisation with co-occurring ironbark species (*Eucalyptus fibrosa* and *E. siderophloia*) (Rutherford *et al.* 2019). Rutherford *et al.* (2019) found that sites comprised of isolated trees were either entirely of hybrid origin or consisted of both pure and hybrid individuals. Of 22 sites sampled, only seven were found to be comprised of 'pure' *E. tetrapleura* (Rutherford *et al.* 2019). The Pacific Highway realignment has resulted in increased fragmentation of remnant patches and isolated trees (Rutherford *et al.* 2019), which may further increase the extent of hybridisation.
13. *Eucalyptus tetrapleura* is inferred to be threatened by adverse fire regimes (particularly high frequency fire and high severity fire). Short inter-fire intervals may result in the disproportionate loss of juveniles in resprouting species (Bradstock and Myerscough 1988), potentially leading to long-term demographic shifts. Repeated short interval fires can also lead to reduced or failed resprouting (Enright *et al.* 2011; Karavani *et al.* 2018; Fairman *et al.* 2019). For a combination sprouting species such as *Eucalyptus tetrapleura*, frequent high severity fire can lead to a reliance on basal resprouting, due to the death of stems at higher fire severities (Zimmer *et al.* 2021). Individuals with smaller stems are more likely to resprout from their bases only, resulting in a loss of height dominance (Zimmer *et al.* 2021). Frequent high severity fire would therefore be likely to shift stands to long-term reliance on basal resprouting due to the continual death of smaller stems.
14. Climate change projections indicate a future trend of increased frequency of severe fire weather and more frequent fires (Abatzoglou *et al.* 2019; Dowdy *et al.* 2019; Jones *et al.* 2022). The North Coast region is projected to become hotter, have more hot days over 35°C, have more dangerous fire weather days, and have a

# NSW Threatened Species Scientific Committee

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longer fire season by 2079 (BOM and CSIRO 2024; AdaptNSW 2025). Regionally, it is projected with high confidence that climate change will result in a harsher fire-weather climate in the future (CSIRO 2025). It is plausible that these changes will lead to more frequent, intense, and severe fires, which will in turn adversely affect the *Eucalyptus tetrapleura* population in the future.

15. *Eucalyptus tetrapleura* L.A.S.Johnson is not eligible to be listed as a Critically endangered species.

16. *Eucalyptus tetrapleura* L.A.S.Johnson is eligible to be listed as an Endangered species as, in the opinion of the NSW Threatened Species Scientific Committee, it is facing a very high risk of extinction in Australia in the near future as determined in accordance with the following criteria as prescribed by the *Biodiversity Conservation Regulation 2017*:

## Assessment against *Biodiversity Conservation Regulation 2017* criteria

The Clauses used for assessment are listed below for reference.

**Overall Assessment Outcome:** *Eucalyptus tetrapleura* was found to be Endangered under Clause 4.3(b)(d)(e i,iii).

### Clause 4.2 – Reduction in population size of species

(Equivalent to IUCN criterion A)

**Assessment Outcome: Data Deficient**

<b>(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:</b>			
	(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.
<b>(2) - The determination of that criteria is to be based on any of the following:</b>			
	(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.	

## NSW Threatened Species Scientific Committee

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### Clause 4.3 - Restricted geographic distribution of species and other conditions (Equivalent to IUCN criterion B)

**Assessment Outcome: Endangered under 4.3(b)(d)(e i,iii)**

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:	

## NSW Threatened Species Scientific Committee

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		(A)	the number of individuals in each population of the species is:
		(I)	for critically endangered species
		(II)	for endangered species
		(III)	for vulnerable species
		(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: Not met**

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.
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Professor Angela Moles, FRSN

Chairperson

NSW Threatened Species Scientific Committee

# NSW Threatened Species Scientific Committee

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# NSW Threatened Species Scientific Committee

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## NSW Threatened Species Scientific Committee

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