

# 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 *Xylosma parvifolia* Jessup as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act and, as a consequence, to omit reference to *Xylosma parvifolia* Jessup from Part 2 of Schedule 1 (Endangered species) 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 Department of Planning, Industry and Environment (DPIE) 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 1481.

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

Submissions close 1<sup>st</sup> March 2024.

### 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 DPIE 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.

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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 Caroline Gross  
Acting Chairperson  
NSW Threatened Species Scientific Committee

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Public Exhibition period: 01/12/2023 – 01/03/2024

## 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 *Xylosma parvifolia* Jessup as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act and, as a consequence, to omit reference to *Xylosma parvifolia* Jessup from Part 2 of Schedule 1 (Endangered species) of the Act. Listing of Critically Endangered species is provided for by Part 4 of the Act.

## Summary of Conservation Assessment

*Xylosma parvifolia* was found to be eligible for listing as Critically Endangered under Criterion 4.3 (a)(d)(e iii).

The main reasons for this listing are:

- 1) It has a very highly restricted geographic range (EOO is 8 km<sup>2</sup>);
- 2) The total number of mature individuals is extremely low (<250);
- 3) It is found at only a single location, scattered across a small area of ridgeline and cliffs in the Southern Mountains region of Lord Howe Island; and
- 4) There is inferred continuing decline in habitat quality as a consequence of increased hydrological deficit driven by climate change and ongoing weed invasion.

The NSW Threatened Species Scientific Committee has found that:

1. *Xylosma parvifolia* Jessup (family Salicaceae) was first described by Jessup (1984). The genus *Xylosma* is now in the family Salicaceae. PlantNet (2023) describes *X. parvifolia* as a 'Shrub to 2 m high, branchlets and petioles minutely puberulous. Leaves ovate-elliptical, lamina 0.4–1.2 (–3) cm long, 0.4–0.8 (–1.5) cm broad, serrate; apex obtuse; petiole reddish brown, 2–3 mm long. Inflorescence to 3 (–5)-flowered; flowers solitary or in short racemes. Sepals 5, obovate, c. 1 mm long, glabrous. Male flowers with c. 12 stamens; filaments 2–2.5 mm long. Female flowers with ovoid-globose ovary, 2 mm long; styles 2, very short. Fruit ovoid-globose, 3 mm long, slightly fleshy, purple.
2. *Xylosma parvifolia* is endemic to Lord Howe Island (NSW Government Office of Environment and Heritage, 2016; NSW Flora Online (PlantNet), 2023). *Xylosma parvifolia* is restricted to narrow, exposed south-westerly and south-easterly ridges above 400m elevation, generally occurring as single plants or in small patches (NSW Government Office of Environment and Heritage, 2016). The maximum distance between Mount Gower and Mount Lidgbird sites is around 2 km (C. Stehn pers. comm. 2022).
3. *Xylosma parvifolia* has a highly restricted range, with both an Extent of Occurrence (EOO) and Area of Occupancy (AOO) of 8 km<sup>2</sup>. It occurs at only one threat-defined location, restricted to small lengths of narrow ridgeline on Mount Gower and Mount Lidgbird (NSW Government Office of Environment and

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Heritage 2016). The entire known population of *X. parvifolia* occurs in an area that can be contained within two 2 km x 2 km grid squares the scale recommended for assessing area of occupancy by IUCN (2022). When EOO is less than or equal to AOO, IUCN (2022) recommend EOO estimates be changed to be equal to AOO to ensure consistency with the definition of AOO as an area that fits within EOO.

4. The total mature population is estimated to be 200 individuals, including both mature and juvenile individuals (NSW Government Office of Environment and Heritage, 2016; NSW Government Saving our Species, 2021; C. Stehn pers. comm 2022). Of these, a minimum of 90% are estimated to be mature (C. Stehn pers. comm 2022). While individuals likely to be saplings and juveniles have been observed, the stunted nature of some communities can make estimation of age and maturity difficult (NSW Government Office of Environment and Heritage, 2016; NSW Government Saving our Species, 2021; C. Stehn pers. comm 2022). Based on these figures the mature population is estimated to be 180-200 plants.
5. *Xylosma parvifolia* is restricted to narrow, exposed, south-westerly or south-easterly cliff faces and ridges on Mount Gower and Mount Lidgbird (NSW Government Office of Environment and Heritage, 2016). *Xylosma parvifolia* occurs in open, exposed sites with minimal canopy cover, and does not tolerate crowding (NSW Government Office of Environment and Heritage, 2016; C. Stehn pers. comm. 2022). The species shares general habitat and features of ecology with three other threatened plants, *Carmichaelia exsul*, *Geniostoma huttonii* and *Coprosma inopinata*, along with more common species (Hutton, 2001, 2005; NSW Government Office of Environment and Heritage, 2016).
6. Little is known about mechanisms of reproduction and dispersal in *Xylosma parvifolia*. *Xylosma* species are typically dioecious (producing male and female flowers on separate plants), and this is almost certainly also true of *X. parvifolia* (Chase & Gardens, 2002; H. Sleumer, 1974). *Xylosma parvifolia* flowers between December and May, producing small, white flowers (NSW Government Office of Environment and Heritage, 2016). The genus *Xylosma* contains both wind pollinated and insect pollinated species, but it is not known which system is employed by *X. parvifolia* (Pfeiffer, 2018; Weber, 2008). *Xylosma parvifolia* produces small, purple fruits, likely to be attractive to birds.
7. During two decades of monitoring, *Xylosma parvifolia* has not been observed to colonise adjacent habitat, and while it persists well at sites where it is already established it appears to struggle to compete with other endemic or invasive species for new space (C. Stehn pers. comm. 2022).
8. The main threats to *Xylosma parvifolia* are competition with introduced and native plant species and increasing hydrological deficit as a result of climate change. 'Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants and 'Anthropogenic Climate Change' are listed as Key Threatening Processes under the Act.

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9. Ongoing climate change on the Lord Howe Island Group poses a direct threat to *Xylosma parvifolia*. There has been an increase in temperature and a decrease in overall rainfall on Lord Howe Island over the last 50 years, with Auld and Leishman (2015) finding that: "...sea level temperatures around Lord Howe Island have risen by some 0.6°C since 1940... average annual air temperature on Lord Howe Island is expected to rise (compared with 1990 levels) by  $1.3 \pm 0.6^\circ\text{C}$  by 2030, although there is much uncertainty around such estimates...For annual rainfall, we found over the last 50 years there had been a decline of 31% (95% CL 4–79%)...Both minimum and maximum temperatures at sea level increased in the last 50 years...".
10. Plant species on Lord Howe Island depend on consistent and ongoing formation of cloud to provide the high humidity and moisture on which they depend (Auld and Leishman, 2015). Cloud forests serve as a 'bucket', absorbing rain and atmospheric moisture at the summit which then flows down, providing available moisture for plant communities further down the slope (Foster, 2001). Increase in sea temperatures is likely to increase the altitude at which clouds form, increasing *hydrological deficit* at lower altitudes and pushing dependent species further towards the summit, dubbed the 'lift-cloud-base hypothesis' (Auld and Leishman, 2015). Cloud lift poses a direct threat to species that live in cloud forest at the summit of Mount Gower and Mount Lidgbird, as well as species such as *Xylosma parvifolia* that are found below the cloud line and receive moisture created by cloud formation at the summit. Ongoing increase in sea temperature, and associated cloud lift and *hydrological deficit*, is therefore likely to reduce the quality and availability of habitat for *X.parvifolia*.
11. *Xylosma parvifolia* is confined to cliffs and ridges at relatively high elevations (~400-600 m), above which habitat is generally unsuitable, largely opening into plateaux dominated by dense vegetation, especially Gnarled Mossy Cloud Forest (C. Stehn pers. comm. 2022). The general lack of adjacent exposed cliffs and ridgelines at higher elevations means that there is limited accessible habitat into which *X. parvifolia* can move as increasing *hydrological deficit* makes their current habitat less suitable (C. Stehn pers. comm. 2022). As a poor competitor, *X. parvifolia* is likely to struggle to colonise new habitat that may become available as *hydrological deficit* forces resident plant communities to higher elevations. Even if resident plant communities are pushed from habitat potentially suitable for *X. parvifolia*, components of these communities, like established trees or generalist weed species, are likely to persist and present an ongoing barrier to colonisation.
12. Invasive weeds pose a severe and ongoing threat to *Xylosma parvifolia* (Lord Howe Island Board, 2016; NSW Government Saving our Species, 2021). Weeds encroach on the habitat of *X. parvifolia*, outcompeting existing plants for resources and space and inhibiting recruitment by reducing the likelihood *X. parvifolia* seeds will find sufficient space and resources to germinate (Lord Howe Island Board, 2016; T. Auld pers. comm. 2022). Of particular concern are *Ageratina adenophora* (Crofton Weed), *Lilium formosanum* (Formosan Lily), *Cenchrus clandestinus* (Kikuyu Grass), *Asparagus aethiopicus* (Ground

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Asparagus), and *Psidium cattleyanum* var. *cattleyanum* (Cherry Guava) (Lord Howe Island Board, 2016; T. Auld pers. comm. 2022). These weed species remain common across Lord Howe Island, and threaten multiple endemic plants and communities, including *X. parvifolia* (Lord Howe Island Board, 2016; NSW Government Saving our Species, 2021; T. Auld pers. comm. 2022). Despite an ongoing intensive weed control program, the overall number of juvenile weeds may be increasing (NSW Government Saving our Species, 2021). This increase is possibly driven by drought and increasing hydrological deficit, with generalist weed species on Lord Howe Island likely more successful than endemics in changing environments, and by the removal of rats (discussed below) (Lord Howe Island Board, 2016; NSW Government Saving our Species, 2021).

13. *Xylosma parvifolia* is threatened by damage or destruction by landslips (NSW Government Saving our Species 2021). Landslips in 2021 prevented access to some monitoring sites (NSW Government Saving our Species, 2021). There is currently no way to prevent or mitigate the threat of landslips at sites where *X. parvifolia* is present (C. Stehn pers. comm. 2022). Climate change may increase the likelihood and severity of sub-tropical storms on and around Lord Howe Island, posing an additional severe threat to plant communities towards the peaks of Mount Gower and Mount Lidgbird (Auld and Leishman 2015). These storms may damage *Xylosma parvifolia* directly or increase the likelihood of landslips as a result of heavy rain.
14. Climate change may increase the likelihood and severity of sub-tropical storms on and around Lord Howe Island, posing an additional severe threat to plant communities towards the peaks of Mount Gower and Mount Lidgbird (Auld and Leishman 2015). These storms may damage *Xylosma parvifolia* directly or increase the likelihood of landslips due to heavy rain.
15. Introduced rodents, in particular the ship rat (*Rattus rattus*) and house mouse (*Mus musculus*), have had a devastating effect on native flora of Lord Howe Island and have been the driving factor in the extinction of at least two Lord Howe Island plant species (Department of Environment and Climate Change (NSW), 2007). The Lord Howe Island Rodent Eradication Program (REP) began in 2019 (Harper *et al.*, 2020) and appears to have been successful, with the final success check scheduled for mid-2023. Ongoing monitoring is in place, both for rodents and to quantify the benefits and/or ecosystem changes resulting from the pest eradication. Historically rodents had not been considered a direct threat to *Xylosma parvifolia* because of its inaccessible habitat (Lord Howe Island Board, 2017). However, there are indications that rodent control has inadvertently removed predation pressures from weed populations, as well as from native vegetation. In the absence of rodents, weed populations are increasing and may spread, posing a more significant threat to *X. parvifolia* (NSW Government Saving our Species, 2021; C. Stehn pers. comm. 2022).
16. *Phytophthora cinnamomi* is an introduced water mould (oomycetes) pathogen that causes catastrophic dieback in many species, *Phytophthora cinnamomi* affects a huge variety of plants across families, including Fabaceae and so may pose a threat to *Xylosma parvifolia* (Government of South Australia Phytophthora

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Technical Group, 2006; NSW Department of Environment and Climate Change, 2008). *Phytophthora cinnamomi* was detected in a small orchard on Lord Howe Island in 2003 and is now considered a resident threat (Auld and Hutton, 2004). It has so far been contained, however movement of residents and tourists across the island risk its spread in the future. 'Infection of native plants by *Phytophthora cinnamomi*' is listed as the Key Threatening Process under the Act.

17. *Xylosma parvifolia* Jessup (Salicaceae) is eligible to be listed as a Critically Endangered species as, in the opinion of the NSW Threatened Species Scientific Committee, it is facing an extremely high risk of extinction in Australia in the immediate 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:**

*Xylosma parvifolia* was found to be Critically Endangered under Clause 4.3 (a)(d)(e 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.	

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

**Assessment Outcome: Critically Endangered under Clause 4.3 (a)(d)(e iii)**

<b>The geographic distribution of the species is:</b>			
	(a)	for critically endangered species	very highly restricted, or
	(b)	for endangered species	highly restricted, or
	(c)	for vulnerable species	moderately restricted,
<b>and at least 2 of the following 3 conditions apply:</b>			
	(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: Data Deficient**

<b>The estimated total number of mature individuals of the species is:</b>				
	(a)	for critically endangered species	very low, or	
	(b)	for endangered species	low, or	
	(c)	for vulnerable species	moderately low,	
<b>and either of the following 2 conditions apply:</b>				
	(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	



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			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: Endangered under Clause 4.5(b).**

<b>The total number of mature individuals of the species is:</b>			
	(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**

<b>The probability of extinction of the species is estimated to be:</b>			
	(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 Caroline Gross  
Acting Chairperson  
NSW Threatened Species Scientific Committee

**Supporting Documentation:**

Rowell T (2022) Conservation Assessment of *Xylosma parvifolia* F.Muell (Fabaceae). NSW Threatened Species Scientific Committee.

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## References:

- Auld TD, Leishman MR (2015) “Ecosystem risk assessment for Gnarled Mossy Cloud Forest, Lord Howe Island, Australia” *Austral Ecology* **40**, 364–372.
- Auld TD, Hutton I (2004) Conservation issues for the vascular flora of Lord Howe Island. *Cunninghamia*, **8**(4), 490–500.
- Chase M, Gardens RB (2002) When in Doubt, Put It in Flacourtiaceae : A Molecular Phylogenetic Analysis Based on Plastid rbcL *DNA Sequences*. **57**(1), 141–181. <https://doi.org/10.2307/4110825>
- Department of Environment and Climate Change (NSW) (2007) Lord Howe Island Biodiversity Management Plan. Sydney.
- Foster P (2001) “The potential negative impacts of global climate change on tropical montane cloud forests” *Earth-Science Reviews* **55**, 73–106. Available at [www.elsevier.com/locate/earsclirev](http://www.elsevier.com/locate/earsclirev)
- Government of South Australia *Phytophthora* Technical Group (2006) *Phytophthora* Management Guidelines 2nd Edition. Adelaide.
- Harper GA, Pahor S, Birch D (2020) “The Lord Howe Island Rodent Eradication: Lessons Learnt from an Inhabited Island” *Proceedings, 29th Vertebrate Pest Conference* 1–11.
- Hutton I (2001) Rare Plant Surveys - Lord Howe Island. Lord Howe Island, NSW.
- Hutton I (2005) Rare Plant Surveys 2 Lord Howe Island. Lord Howe Island, NSW.
- IUCN Standards and Petitions Committee. (2022). Guidelines for Using the IUCN Red List Categories and Criteria. Version 15. IUCN Standards and Petitions Committee. <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>.
- Jessup LW (1984) A Revision of *Xylosma* G. Forster (Flacourtiaceae) In Australia. *Austrobaileya*, **2**(1), 77–79.
- Lord Howe Island Board (2016) Lord Howe Island Weed Management Strategy 2016–2025. Lord Howe Island, NSW.
- Lord Howe Island Board (2017) Lord Howe Island Rodent Eradication Project NSW Species Impact Statement. Lord Howe Island, NSW.
- NSW Department of Environment and Climate Change (2008). *Statement of intent for infection of native plants by Phytophthora cinnamomi*. Sydney

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NSW Government Office of Environment and Heritage (2016). SoS Lord Howe Island Flora Monitoring Plan for Saving our Species Conservation Projects: Hutton's *Geniostoma*, Mountain *Xylosma*, Mountain *Coprosma*. Sydney.

NSW Government Saving our Species (2021). Saving our Species project 2020-21 annual report card *Xylosma parvifolia*. Sydney.

Pfeiffer PMM (2018) Plant-bee interactions and pollen flux in restored areas of Atlantic Forest. PhD Thesis, Universidade de São Paulo. In *Scholar.Archive.Org*. [https://scholar.archive.org/work/iqw3osgcuzbqdkqrnp7emt5454/access/wayback/http://www.teses.usp.br/teses/disponiveis/41/41134/tde-07032019-094022/publico/Paula\\_Montoya\\_CORRIG.pdf](https://scholar.archive.org/work/iqw3osgcuzbqdkqrnp7emt5454/access/wayback/http://www.teses.usp.br/teses/disponiveis/41/41134/tde-07032019-094022/publico/Paula_Montoya_CORRIG.pdf)

Sleumer H (1974) A concise revision of the Flacourtiaceae of New Caledonia and the Loyalty Islands. *Blumea*, 22, 123–147.

Weber A (2008) Pollination in the plants of the Golfo Dulce area Polinización en las plantas del área de Golfo Dulce. *Stapfia*, 80, 509–538.