

**Advice to the Minister for the Environment, Heritage and the Arts
from the Threatened Species Scientific Committee (the Committee)
on Amendments to the list of Threatened Species
under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)**

1. Scientific name (common name)

Phebalium distans (Mt. Berryman Phebalium)

2. Reason for Conservation Assessment by the Committee

This advice follows assessment of information provided by a public nomination to list the Mt. Berryman Phebalium. The nominator suggested listing in the endangered category of the list.

This is the Committee's first consideration of the species under the EPBC Act.

3. Summary of Conclusion

The Committee judges that the species has been demonstrated to have met sufficient elements of Criteria 2 and 3 to make it **eligible** for listing as **critically endangered**.

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 4 to make it **eligible** for listing as **endangered**.

The highest category for which the species is eligible to be listed is **critically endangered**.

4. Taxonomy

The species is conventionally accepted as *Phebalium distans* (Forster 2003). It was previously described as *Phebalium squamulosum* subsp. *squamulosum*.

5. Description

The Mt. Berryman Phebalium is a small tree in the Rutaceae family. It grows to 8 metres with a trunk of up to 15 cm in diameter at breast height. The flowers are always cream (ageing cream-fawn). The fruit is a capsule with small seeds which are shed locally. It is found in semi-evergreen vine thicket on red volcanic soils or communities adjacent to this vegetation type in small groups or as solitary specimens (Forster 2003).

6. National Context

The Mt. Berryman Phebalium is endemic to south-eastern Queensland, where it is currently known from ten populations at three locations; five of these populations are in close proximity at Mt Berryman (Lockyer Valley Regional Council); four are near Kingaroy (South Burnett Regional Council); and the tenth at Mt Walla, near Coalstoun Lakes (North Burnett Regional Council). These three locations are over 90 km apart and are separated by land cleared for agriculture. The extent of occurrence of this species has been estimated at less than 100 km² and the area of occupancy less than 10 km².

The total population of the Mt. Berryman Phebalium is estimated to be approximately 1000 plants, of which 175 are mature individuals.

Mt. Berryman Phebalium is not currently listed under any Australian or State Government legislation.

7. Relevant Biology/Ecology

The Mt. Berryman Phebalium generally flowers during spring, however, opportunistic flowering can occur at other times after moderate falls of rain. The pollination mechanism is unknown. Fruiting generally occurs during late summer and early autumn. The capsular fruit produce small seeds that have a limited dispersal ability. Plants become sexually mature after they reach 1-2 m in height. The plant has never been recorded as reproducing vegetatively, and medium-term monitoring indicates that this species does not readily reproduce under disturbance regimes, and never as a result of fire.

8. Description of Threats

Threats to the Mt. Berryman Phebalium include vegetation clearance and physical damage to plants associated with road works and roadside maintenance. Many of the vegetation remnants where the Mt. Berryman Phebalium occurs are too small to be mapped and protected under the Queensland *Vegetation Management Act 1999*. Consequently, utilities infrastructure development and maintenance (such as for roads, telephone and powerlines) may pose a significant threat to the Mt. Berryman Phebalium.

Increasing urbanisation in the Tessman's Road area of the South Burnett region and the subsequent development of electricity and water infrastructure is placing increasing pressure on the largest population of the Mt. Berryman Phebalium. South Burnett Regional Council has been lobbied to seal Tessman's Road. If this were to go ahead, it would be necessary to remove surrounding vegetation that includes the Mt. Berryman Phebalium.

The main potential threats to the Mt. Berryman Phebalium include the drift of agricultural chemicals, weed invasion by weeds such as *Megathrysus maximus* (Guinea Grass) and *Asparagus africanus* (Climbing Asparagus), erosion, soil compaction due to human traffic, dumping of rubbish, inappropriate modification of its habitat, vandalism and climate change.

Forster (2003) describes past clearing of vegetation for agricultural land as the primary cause of the decline in numbers of this species, and weed invasion as its current primary threat. Many of these weeds increase the susceptibility of the Mt. Berryman Phebalium to fire as they increase fuel load.

9. Public Consultation

The nomination was made available for public exhibition and comment for 30 business days. No comment was received from the public.

10. How judged by the Committee in relation to the criteria of the EPBC Act and Regulations

The Committee judges that the species is **eligible** for listing as **critically endangered** under the EPBC Act. The assessment against the criteria is as follows:

Criterion 1: It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers

The total population of juvenile and mature individuals is estimated to be approximately 1000 plants. There are, however, no historical population data available. Forster (2003) suggests that the species' distribution was historically more wide spread, and that its distribution has been reduced due to habitat destruction from land clearing. The Committee judges that the species is suspected to have undergone a reduction in numbers, but there are insufficient data available to judge whether the suspected reduction has been very severe, severe, substantial or less than substantial. Therefore, as the species has not been demonstrated to have met all of the elements of Criterion 1, it is **not eligible** for listing in any category under this criteria.

Criterion 2: Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited

The species' extent of occurrence is estimated to be less than 100 km² and its area of occupancy less than 10 km². Its distribution is fragmented, with the ten populations being found at three locations in south-eastern Queensland (Mt Berryman, Mt Walla and Mt Jones Plateau). These locations are over 90 km apart and separated by land cleared for agriculture, with no connectivity between the remnants. For a species with limited seed dispersal and no record of vegetative growth, the Committee considers this geographic distribution to be very restricted.

Forster (2003) suggests that this species was much more widespread in the past, and that its distribution has been greatly reduced due to the destruction of habitat. This species is likely to continue to decline, as the largest population at Mt Berryman is subject to increasing development pressures. Increasing urbanisation in the Tessman's Road area and subsequent development of electricity and water infrastructure is placing increasing pressure on the Mt. Berryman Phebalium. South Burnett Regional Council has been lobbied to seal Tessman's Road. If this were to go ahead, it would be necessary to remove surrounding vegetation that includes the Mt. Berryman Phebalium. The nominator estimates that the Mt. Berryman Phebalium will undergo a rapid decline within a 10-year period due to the impact of vegetation clearing, road works and roadside maintenance, however there is no empirical evidence to support or refute this claim.

The remaining Mt. Berryman Phebalium populations are subject to a variety of threats such as vegetation clearance, road works and roadside maintenance, weed invasion and wild fire (see Section 8), which make the species' very restricted geographic distribution precarious for the survival of the species. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 2 to make it **eligible** for listing as **critically endangered**.

Criterion 3: The estimated total number of mature individuals is limited to a particular degree; and either
(a) evidence suggests that the number will continue to decline at a particular rate; or
(b) the number is likely to continue to decline and its geographic distribution is precarious for its survival

Haskard (2006) estimates that approximately 175 mature Mt. Berryman Phebalium plants remain. Considering the species' exposure to a variety of threats, the fragmentation of its distribution and its limited long-range dispersal ability, the Committee considers that the total number of mature individuals is very low.

The geographic distribution of the species is precarious to the species' survival due to the current impact of threats, fragmentation, and the very restricted extent of occurrence and area of occupancy (see Section 8 and Criterion 2 above).

This species is likely to continue to decline, as the largest population at Mt Berryman is subject to increasing development pressures as discussed under Criterion 2 above.

The Committee considers that the estimated total number of mature individuals of the species is very low, the number is likely to decline and the species' geographic distribution is precarious for the survival of the species. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 3 to make it **eligible** for listing as **critically endangered**.

Criterion 4: The estimated total number of mature individuals is extremely low, very low or low

Haskard (2006) estimates that approximately 175 mature Mt. Berryman *Phebalium* plants remain. This estimate was derived from an analysis of stem count and size class data from a population study at Kingaroy, which was extrapolated to support more general data from other known populations. Considering the species' exposure to a variety of threats (see Section 8), the fragmentation of its populations and its limited long-range dispersal ability, the Committee considers that the total number of mature individuals is very low. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 4 to make it **eligible** for listing as **endangered**.

Criterion 5: Probability of extinction in the wild that is at least:

- a) **50% in the immediate future; or**
- b) **20% in the near future; or**
- c) **10% in the medium-term future.**

Although the nominator estimates a rapid decline within ten years, there are insufficient data available to estimate a probability of extinction of the species in the wild over a relevant timeframe that can be scientifically verified. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 5, it is **not eligible** for listing in any category under this Criterion.

11. CONCLUSION

Phebalium distans (Mt. Berryman *Phebalium*) was nominated for inclusion in the list of threatened species referred to in section 178 of the EPBC Act. The nominator suggested listing in the endangered category of the list.

The Committee accepts that the species is known from ten fragmented populations, which is not consistent with its historical distribution. The extent of occupancy is less than 100 km² and the area of occurrence less than 10 km², which, due to the species' limited dispersal ability, the Committee judges to be very restricted and the geographic distribution to be precarious for the survival of the species. Therefore, the species has been demonstrated to have met sufficient elements of Criterion 2 to make it **eligible** for listing as **critically endangered**.

The Committee accepts that the estimated number of mature individuals is 175, which, considering the species' limited dispersal ability is very low. The Committee also accepts that the species geographic distribution is precarious for the survival of the species and that due to current threats affecting the largest population near Kingaroy, its numbers are likely to decline. Therefore, the species has been demonstrated to have met sufficient elements of Criterion 3 to make it **eligible** for listing as **critically endangered**.

Considering the species' exposure to a variety of threats, its limited long-range dispersal ability, and the estimated number of mature individuals being 175, the Committee considers the number of mature individuals to be very low, therefore the species has been demonstrated to have met sufficient elements of Criterion 4 to make it **eligible** for listing as **endangered**.

The highest category for which the species is eligible to be listed is **critically endangered**.

Recovery Plan

The Committee considers that there should not be a recovery plan for this species, as this species is a component of the EPBC Act listed 'Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions' ecological community, for which a recovery plan is currently being prepared.

12. Recommendations

- (i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the **critically endangered** category:

***Phebalium distans* (Mt. Berryman Phebalium)**

- (ii) The Committee recommends that there should not be a recovery plan for this species.

Associate Professor Robert J.S. Beeton

Chair

Threatened Species Scientific Committee

13. References cited in the advice

Forster, P. I. (2003), '*Phebalium distans* P. I. Forst. (Rutaceae), a new and endangered species from south-eastern Queensland, and reinstatement of *P. longifolium* S. T. Blake, *Austrobaileya*, vol. 6, no. 3, pp 437-444.

Haskard, C. M. (2006), 'A new and significant population of the endangered (yet unlisted) species, *Phebalium distans*, Tessman's Road, Kingaroy' (unpublished report).