

***Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954) (Myrtaceae)**

Distribution: Endemic to NSW

Current EPBC Act Status: not listed

Current NSW TSC Act Status: Critically Endangered

Proposed change for alignment: list on EPBC Act as Critically Endangered

Conservation Advice: *Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954).

**Summary of Conservation Assessment**

*Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954) is eligible for listing as Critically Endangered under Criterion B1ab(iii) (v);

The main reasons for the species being eligible for listing in the Critically Endangered category are i) that the species has a very highly restricted geographic range with an extent of occurrence (EOO) estimated to be approximately 40 km<sup>2</sup> measured by a convex polygon encompassing the currently known sites, as recommended by IUCN (2016); ii) a continuing decline is estimated in area and extent and quality of habitat and the number of mature individuals through ongoing clearing, too frequent fire and habitat degradation; and iii) severe fragmentation.

Assessment against IUCN Red List criteria*Criterion A Population Size reduction.*

Assessment Outcome: Data deficient.

Justification: Insufficient data to assess.

*Criterion B Geographic range*

Assessment Outcome: Critically Endangered under Criterion B1a, b(iii),(v).

Justification: The extent of occurrence (EOO) for *Eucalyptus* sp. Cattai was estimated to be approximately 40 km<sup>2</sup>, which is very highly restricted. A species with an EOO of less than 100 km<sup>2</sup>, would be considered to meet the threshold for the category of critically endangered based on geographic range. The area of occupancy (AOO) was estimated to be 32 km<sup>2</sup> based on eight 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2016). and at least 2 of the following:

a) the population or habitat is observed or inferred to be severely fragmented.

Assessment Outcome: subcriterion met.

Justification: *Eucalyptus* sp. Cattai occurs in a semi-rural area of northern Sydney that is undergoing urban expansion. Although there are areas of bushland, the area is largely scattered with freehold properties and dwellings. Fragmentation of the habitat has occurred and it is likely that the habitat patches may have become severely fragmented.

Whether the habitat fragmentation is leading to biological isolation in the species is unknown. There is likely to be disruption of pollination and seed dispersal mechanisms as the habitat has been cleared across the distribution, but the extent to which this has occurred is uncertain. The possibility of recolonisation of other patches of bush if the current patches are lost is uncertain, but likely to be very low. Over 50% of the remnant sites for the species are not considered to be viable.

Consequently, it is likely that the species is severely fragmented, and for this assessment this is assumed based on a precautionary approach.

b) a projected or continuing decline is observed, estimated or inferred.

Assessment Outcome: subcriterion met.

Justification: There is evidence for continuing decline of the habitat of *Eucalyptus* sp. Cattai through ongoing clearing, too frequent fire and habitat degradation.

c) extreme fluctuations:

Assessment Outcome: subcriterion not met.

Justification: There is unlikely to be extreme fluctuations in *Eucalyptus* sp. Cattai due to the long-lived nature of mature individuals, along with their capacity to survive fires.

*Criterion C Small population size and decline.*

Assessment Outcome: Endangered via C2ai.

Justification: There are thought to be at least 320 mature individuals, though exact numbers are unknown. Plant numbers are likely to be fewer than 2500.

C1. An estimated continuing decline of at least 10% over 3 generations.

Assessment Outcome: Data deficient.

C2. A continuing decline

Assessment Outcome: subcriterion met.

Justification: There is evidence for continuing decline of the habitat of *Eucalyptus* sp. Cattai through ongoing clearing, too frequent fire and habitat degradation.

And one of the following:

ai) The number of mature individuals in each population is less than a certain threshold.

Assessment Outcome: subcriterion met at Endangered threshold.

Justification: No population is estimated to contain more than 250 mature individuals (Endangered threshold).

aii) the % mature individuals on one population is at certain thresholds:

Assessment Outcome: data deficient

Justification: there is no data on the proportion of mature individuals across all populations.

b) Extreme fluctuations in the number of mature individuals

Assessment Outcome: subcriterion not met.

Justification: No: There is unlikely to be extreme fluctuations in *Eucalyptus* sp. Cattai due to the long-lived nature of mature individuals, along with their capacity to survive fires.

*Criterion D Very small or restricted population.*

Assessment Outcome: Vulnerable via D1.

Justification: There are thought to be at least 320 mature individuals, though exact numbers are unknown. Plant numbers are likely to be fewer than 2500 and there is a high likelihood that number of mature individuals is below 1000.

D1. The number of mature individuals is less than a certain threshold

Assessment Outcome: subcriterion met at Vulnerable threshold.

Justification: population size is inferred to be likely to be fewer than 1000 mature individuals (Vulnerable threshold).

D2. Restricted AOO or number of locations.

Assessment Outcome: subcriterion not met.

Justification: Whilst the distribution of *Eucalyptus* sp. Cattai is very highly restricted, the area of occupancy is not less than 20 km<sup>2</sup>.

Consequently *Eucalyptus* sp. Cattai would meet Criterion D as Vulnerable.

*Criterion E Quantitative Analysis.*

Assessment Outcome: Data deficient.

Justification: Insufficient data to assess.

### Description

NSW Scientific Committee (2015) state that “The following description of *Eucalyptus* sp. Cattai (family Myrtaceae) is taken from PlantNet (The Royal Botanic Gardens and Domain Trust accessed June 2014): “Small mallee-like tree to 4.5 m high, with more or less crooked trunks and bark thick, sub-fibrous, furrowed, but loose on lower trunk tending to scaly bloodwood type higher up. Adult leaves disjunct, lanceolate to broad lanceolate, 4.6–11.5 cm long, 1–4.2 cm wide, dark green, glossy, discolorous, penniveined. Umbellasters 6–8-flowered; peduncle flattened or angular, 5–13 mm long; pedicels terete, 0–6 mm long. Buds fusiform to ovoid or conical, 6–10 mm long, 3.5–5 mm diam., scar present; calyptra conical to hemispherical, sometimes slightly beaked, more or less ribbed, at least as wide as hypanthium, length longer or shorter than hypanthium. Fruit hemispherical or cup-shaped, 5–6 mm long, 5–7 mm long; disc flat to raised; valves exserted.” V. Klaphake (*in litt.* September 2014) provides the following comparisons between *E. sp. Cattai*, *E. resinifera* and *E. notabilis*. Note these should be used only as a guide to help identification:

Character	<i>E. sp. Cattai</i>	<i>E. resinifera</i>	<i>E. notabilis</i>
Habit	mallee or small crooked tree to 5 (rarely 8) m tall	tree to 25 m tall	tree to 25 m tall
Bark	coarse fibrous with thin flat pieces on ridges	coarse fibrous	coarse fibrous
Soil type	sandstone	sand/clay transition	sand/clay transition
Habitat	heath, or areas with scattered low trees	forest	forest
Intermediate leaves	ovate	lanceolate	lanceolate
Buds	calyptra compressed	calyptra tapered	calyptra compressed
Fruit	valves enclosed or tips only to rim height, disc slightly raised	valves exsert, often strongly so, disc slightly raised	valves exsert, often strongly so, disc strongly raised

*Eucalyptus* sp. Cattai was previously regarded as an intergrade between *E. notabilis* and *E. resinifera* subsp. *resinifera* by K.D. Hill and L.A.S. Johnson (Royal Botanic Gardens and Domain Trust accessed 2014) but has since been identified as a separate species (V. Klaphake pers. comm. May 2013)."

### Distribution

NSW Scientific Committee (2015) state that “*Eucalyptus* sp. Cattai is only known from north-western Sydney between Castle Hill and Cattai. Previously the species was thought to occur at Colo Heights (Scientific Committee 1999), however this record is now considered to be of a different taxon. *Eucalyptus* sp. Cattai grows as isolated trees or small groups of trees in scrub, heath and low woodland, on sandstone-derived soils (Royal Botanic Gardens and Domain Trust, accessed 2014). The habitat may also be associated with the edges of the Mittagong Formation, which may include Mittagong sandstone and shale, and at some sites with the presence of laterised loose stones (S. Douglas pers. comm. March 2013).

The number of mature individuals of *Eucalyptus* sp. Cattai is unknown, however there are currently estimated to be fewer than 2500 individuals. There are up to seven populations of *E. sp. Cattai* located on land of various tenures. The three largest populations total approximately 280 – 570 trees, the range here indicating the difficulty in differentiating individuals of this mallee species (Scott, 2013). These three populations occur on former Crown Land granted to the Deerubbin Local Aboriginal Land Council. The remainder of the species is restricted to scattered individuals or groups of trees across the species' range. There are no populations known from a conservation reserve."

### Ecology

Scott (2013) states that "*Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954) grows as isolated trees or small groups of trees in scrub, heath and low woodland, in sandstone-derived soils (RBGDT, accessed 2013). The habitat may also be associated with the edges of the Mittagong Formation, which may include Mittagong sandstone and shale, and at some sites the presence of laterised loose stones (Douglas pers. comm. Mar 2013)."

"The fertility of the trees is largely unknown, but observations have shown that some trees don't flower, or produce seed, possibly due to in-breeding depression (Douglas pers. comm. July 2012). The response of *Eucalyptus* sp. Cattai to fire is unknown but likely to be the same as the closely related species *E. resinifera* subsp. *resinifera*. This taxon is a resprouter, via both epicormic and basal growth; it stores non-dormant seed in the canopy, which is dispersed via the wind; there is post-fire recruitment observed (OEH Fire Response Database)."

### Threats

NSW Scientific Committee (2015) state that "The area where *Eucalyptus* sp. Cattai occurs is highly urbanised and the remnant vegetation is fragmented due to expanding urban development. Known or likely threats to *E. sp. Cattai* are ongoing clearing and fragmentation, road works, disturbance to habitat from urban and rural-residential land use, clearing and understorey suppression for bushfire management and an altered fire regime and apparent lack of recruitment (S. Douglas *in litt.* December 2012, V. Klaphake *in litt.* September 2014). These threats are impacting on the species across its current geographic range."

### Conservation and Management Actions

There is no recovery plan for this species but there is a NSW Saving Our Species site managed program for the species.

#### Habitat loss, disturbance and modification

- Prevent further clearing or disturbance of known and suitable habitat;
- Ensure infrastructure construction and maintenance (e.g. for roads and tracks) does not damage plants or remaining habitats.
- Instigate appropriate fire management that is not detrimental to the species. This requires consideration of all components of the fire regime and adherence to fire frequency thresholds in the NSW Rural Fire Service Bush Fire Code Threatened Species Hazard Reduction list for plants.  
[http://www.rfs.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0017/24335/ThreatenedSpeciesHazardReductionList-Part1-Plants.pdf](http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0017/24335/ThreatenedSpeciesHazardReductionList-Part1-Plants.pdf)

#### Invasive species

- reduce impact of weeds on known populations.

### Ex situ conservation

- Develop a targeted seed collection program for ex situ seed banking from across the full distribution of the species and a plan for translocation.

### Stakeholder Management

- Inform land owners and managers of sites where there are known populations and consult with these groups regarding options for conservation management and protection of the species.

### **Survey and Monitoring priorities**

- Monitor known sites to determine trends in population size over time.
- Monitor impact of fire and weeds on habitat quality and population numbers.

### **Information and research priorities**

- Undertake ecological research into the species' life history, ecology and germination requirements relevant to the persistence of the species. Priorities include factors controlling recruitment in the species, such as flowering and fruiting, seed germination, post-fire recruitment, juvenile growth and development of ability to resprout after fire.

### **References**

IUCN Standards and Petitions Subcommittee (2016) Guidelines for Using the IUCN Red List Categories and Criteria. Version 12. Prepared by the Standards and Petitions Subcommittee. <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>.

NSW Scientific Committee (2015) Final Determination to list the tree *Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954) as a CRITICALLY ENDANGERED SPECIES. Accessed 15<sup>th</sup> August 2016. <http://www.environment.nsw.gov.au/resources/threatenedspecies/determinations/FDEucalCattaCR.pdf>

Royal Botanic Gardens and Domain Trust (2014) PlantNET – The Plant Information Network System of The Royal Botanic Gardens and Domain Trust, Sydney, Australia (version 2.0). <http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&search=yes&name=search=eucalyptus+cattai> (accessed June 2014)

Royal Botanic Gardens and Domain Trust (2013) PlantNET – The Plant Information Network System of The Royal Botanic Gardens and Domain Trust, Sydney, Australia (version 2.0). [http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Eucalyptus~sp.+Cattai+\(Gregson+s.n.,+28+Aug+1954\)](http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Eucalyptus~sp.+Cattai+(Gregson+s.n.,+28+Aug+1954)) (accessed August 2013)

Scott J (2013) *Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954). Draft report to NSW Scientific Committee.

# NSW SCIENTIFIC COMMITTEE

## Final Determination

The Scientific Committee, established by the *Threatened Species Conservation Act 1995*, has made a Final Determination to list the tree, *Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954) as a **CRITICALLY ENDANGERED SPECIES** in Part 1 of Schedule 1A of the Act and, as a consequence, to omit reference to *Eucalyptus* sp. Cattai (NSW 318983) from Part 1 of Schedule 1 (Endangered species) of the Act. Listing of Critically Endangered species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. The currently accepted name for the taxon is *Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954), hereafter referred to as *Eucalyptus* sp. Cattai. The species was listed under the synonym of *Eucalyptus* sp. Cattai (NSW 318983) as an Endangered species in 1999 prior to the existence of the critically endangered threat category. *Eucalyptus* sp. Cattai was previously regarded as an intergrade between *E. notabilis* and *E. resinifera* subsp. *resinifera* by K.D. Hill and L.A.S. Johnson (Royal Botanic Gardens and Domain Trust accessed 2014) but has since been identified as a separate species (V. Klaphake pers. comm. May 2013).
2. The following description of *Eucalyptus* sp. Cattai (family Myrtaceae) is taken from PlantNet (The Royal Botanic Gardens and Domain Trust accessed June 2014): “Small mallee-like tree to 4.5 m high, with more or less crooked trunks and bark thick, sub-fibrous, furrowed, but loose on lower trunk tending to scaly bloodwood type higher up. Adult leaves disjunct, lanceolate to broad lanceolate, 4.6–11.5 cm long, 1–4.2 cm wide, dark green, glossy, discolorous, penniveined. Umbellasters 6–8-flowered; peduncle flattened or angular, 5–13 mm long; pedicels terete, 0–6 mm long. Buds fusiform to ovoid or conical, 6–10 mm long, 3.5–5 mm diam., scar present; calyptra conical to hemispherical, sometimes slightly beaked, more or less ribbed, at least as wide as hypanthium, length longer or shorter than hypanthium. Fruit hemispherical or cup-shaped, 5–6 mm long, 5–7 mm long; disc flat to raised; valves exserted.” V. Klaphake (*in litt.* September 2014) provides the following comparisons between *E. sp. Cattai*, *E. resinifera* and *E. notabilis*. Note these should be used only as a guide to help identification:

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3. *Eucalyptus* sp. Cattai is only known from north-western Sydney between Castle Hill and Cattai. Previously the species was thought to occur at Colo Heights (Scientific Committee 1999), however this record is now considered to be of a different taxon. *Eucalyptus* sp. Cattai grows as isolated trees or small

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groups of trees in scrub, heath and low woodland, on sandstone-derived soils (Royal Botanic Gardens and Domain Trust, accessed 2014). The habitat may also be associated with the edges of the Mittagong Formation, which may include Mittagong sandstone and shale, and at some sites with the presence of laterised loose stones (S. Douglas pers. comm. March 2013).

4. The number of mature individuals of *Eucalyptus* sp. Cattai is unknown, however there are currently estimated to be fewer than 2500 individuals. There are up to seven populations of *E. sp. Cattai* located on land of various tenures. The three largest populations total approximately 280 – 570 trees, the range here indicating the difficulty in differentiating individuals of this mallee species (Scott, 2013). These three populations occur on former Crown Land granted to the Deerubbin Local Aboriginal Land Council. The remainder of the species is restricted to scattered individuals or groups of trees across the species' range. There are no populations known from a conservation reserve.
5. The geographic distribution of *Eucalyptus* sp. Cattai is very highly restricted. The extent of occurrence is approximately 40 km<sup>2</sup>, measured by a convex polygon encompassing the currently known sites, as recommended in the IUCN Guidelines (2014). The area of occupancy (AOO) was estimated to be 32 km<sup>2</sup> based on eight 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2014).
6. The area where *Eucalyptus* sp. Cattai occurs is highly urbanised and the remnant vegetation is fragmented due to expanding urban development. Known or likely threats to *E. sp. Cattai* are ongoing clearing and fragmentation, road works, disturbance to habitat from urban and rural-residential land use, clearing and understorey suppression for bushfire management and an altered fire regime and apparent lack of recruitment (S. Douglas *in litt.* December 2012, V. Klaphake *in litt.* September 2014). These threats are impacting on the species across its current geographic range. 'Clearing of native vegetation' is listed as a Key Threatening Process under the NSW *Threatened Species Conservation Act* 1995.
7. *Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954) is eligible to be listed as a Critically Endangered species as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation* 2010:

## Clause 7 Restricted geographic distribution and other conditions

The geographic distribution of the species is estimated or inferred to be:

(a) very highly restricted,

and either:

- (d) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
  - (a) an index of abundance appropriate to the taxon, or
  - (b) the geographic distribution, habitat quality or diversity, or genetic diversity.

Dr Mark Eldridge  
Chairperson  
Scientific Committee

Exhibition period: 22/05/15 – 17/07/15

Proposed Gazettal date: 22/05/15

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[http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Eucalyptus~sp.+Cattai+\(Gregson+s.n.,+28+Aug+1954\)](http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Eucalyptus~sp.+Cattai+(Gregson+s.n.,+28+Aug+1954))  
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- Scott J (2013) *Eucalyptus* sp. Cattai (Gregson s.n., 28 Aug 1954). Draft report to NSW Scientific Committee.