



Review of the Coastal IFOA koala browse tree list for the north coast subregions

Coastal IFOA Monitoring Program

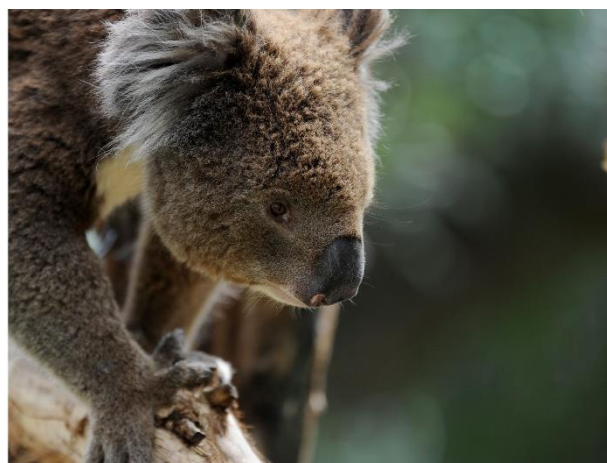
This note summarises a review of the koala browse tree species list in the Coastal Integrated Forestry Operations Approvals (IFOA). The review was led by Associate Professor Ben Moore, Western Sydney University, and Dr Karen Marsh, Australian National University, as part of the [Coastal IFOA Monitoring Program](#).

After considering best available evidence, the researchers have suggested potential changes to the current list of koala browse trees for the Upper and Lower North East Coastal IFOA Subregions.

The Coastal IFOA was designed to deliver ecologically sustainable forest management, which includes rules to identify and protect koala browse trees that must be retained during native forest harvesting. The Coastal IFOA was approved by the NSW Government in 2018.

The Coastal IFOA lists **three primary koala browse** species groups within the Upper and Lower North East Subregions, which must constitute at least 50 percent of retained browse trees where available:

- Tallowwood (*Eucalyptus microcorys*)
- Swamp mahogany (*E. robusta*)
- Red gums (*E. tereticornis*, *E. glaucina*, *E. seeana* and hybrids)



The remainder of retained tree species can be selected from the secondary browse tree list. This list contains nine species groups including grey gums, grey boxes and peppermints.

The research

[Recent research](#) led by Associate Professor Ben Moore and Dr Karen Marsh as part of the Natural Resources Commission's Koala Research Program, suggested that the Coastal IFOA browse tree classifications may not adequately reflect the diets and nutritional value of tree species for koalas in native forests. Based on these findings, the NSW Forest Monitoring Steering Committee commissioned further research to review the Coastal IFOA koala browse tree list under the Coastal IFOA monitoring program.

The purpose of this review is to understand the alignment between the current knowledge on high value koala browse tree species and the species listed under the Coastal IFOA. Following

this, the researchers explored if there is sufficient evidence to support adjusting the list to better meet Coastal IFOA outcomes. This could include adding or removing tree species.

To inform this review, the researchers:

- considered a newly revised and expanded analysis of koala diet composition based upon the molecular faecal diet composition analysis
- collated information from the literature about koala use of eucalypt species on the current coastal IFOA browse tree list
- interviewed ten experts with knowledge of koala browse tree preferences in the upper and lower northeast subregions.

New evidence for preferred browse trees

Diet analysis

The revised diet analysis found **tallowwood** (*E. microcorys*) and **small-fruited grey gum** (*E. propinqua*) were the key food tree species for koalas in the north coast forests sampled (**Figure 1**). Importantly, the researchers noted that the frequency of detection of a browse species in scats does not correspond directly to the frequency of its consumption. This is due to tree species more readily digested by koalas being detected for a shorter duration after consumption compared to less digestible species.

As such, the researchers applied methods to account for differences in the relative persistence of each tree species in the koala's digestive system. The analysis suggests tallowwood (*E. microcorys*) and small-fruited grey gum (*E. propinqua*) may account for nearly half of the koala's total diet (30 and 17 percent respectively).

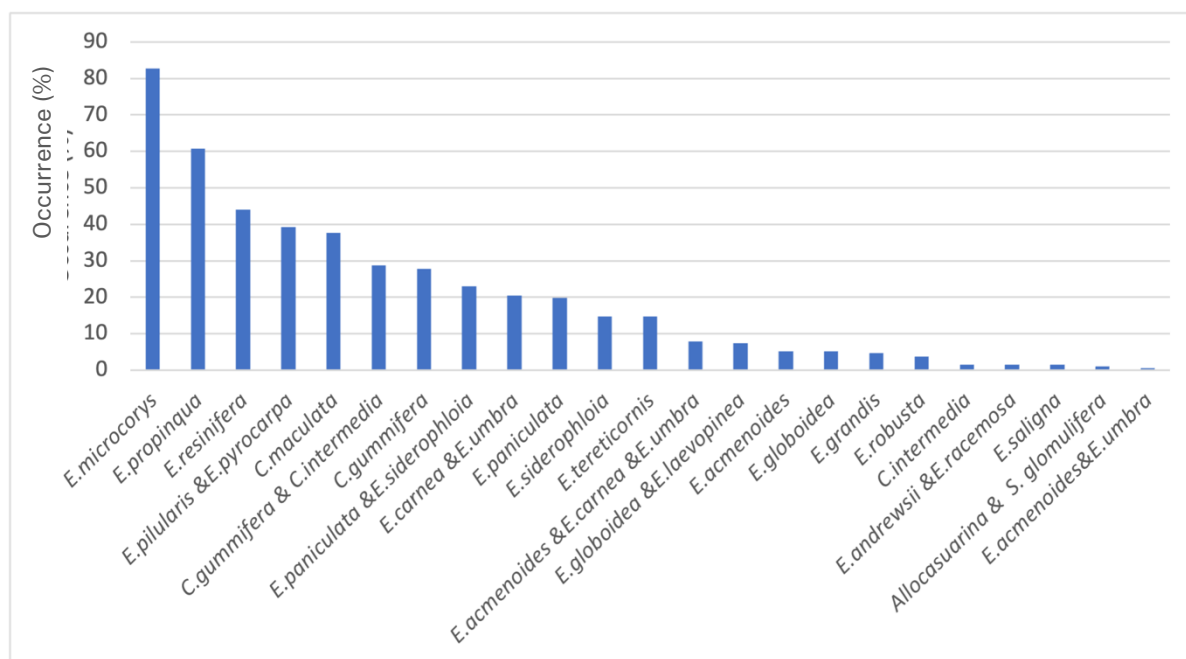


Figure 1: Detection (frequency of occurrence) of food tree species in 191 koala scat samples

Literature review

The literature review focused on:

- koala use of tree species listed as secondary browse trees under the Coastal IFOA; and,
- potential additional species identified by the researchers (see discussion below).

There was strong evidence that koalas use grey gums (*E. punctata* and *E. propinqua*) extensively¹, and these species can be a large component of their diet in some areas. There was also clear evidence that koalas use Sydney blue gum (*E. saligna*) at times, consistent with its listing as a secondary browse species under the Coastal IFOA.

Other notes:

- koalas do feed from the ironbarks (*E. paniculata* and *E. siderophloia*) but they are not generally preferred
- koalas will sometimes use spotted gum (*Corymbia maculata*); however the evidence is unclear on the quantity actually consumed
- good evidence to suggest koalas use red mahogany (*E. resinifera*) and consume it in sufficient quantities for it to be considered for listing as a secondary browse species
- clear evidence to suggest snow gum and New England blackbutt are not significantly used for feeding and mixed evidence on koalas feeding from other species such as grey boxes, peppermint species, ribbon gums, messmate, mountain gum and flooded gums.

A summary of the literature review can be found in the [full report](#).

Expert review

Consultation with subject matter experts addressed most of the listed koala browse trees under the Coastal IFOA koala browse tree list and explored potential additional tree species.

The experts:

- strongly agreed that tallowwood is a primary koala food tree, also noting that it is a highly valued commercial timber species
- suggested that the value of the forest patch to koalas may decline if insufficient tallowwood is retained
- strongly supported the view that grey gums (*E. punctata*, *E. propinqua* and *E. canaliculata*) are more valuable to koalas than is currently recognised by their secondary status on the Coastal IFOA koala browse tree list
- noted that *E. propinqua* (small-fruited grey gum) (or *E. punctata* south of Taree) is particularly valuable to koalas in the absence of tallowwood because they are often present in reasonable numbers even when tallowwood is not abundant
- nearly all recognised there were potential environmental risks with expanding the list of primary food trees. For example, if a new addition to the list were to be retained instead of tallowwood.

¹ Feeding observations, tree use observations and faecal analysis.

Opportunities to improve the koala browse tree listings

There is strong evidence that koalas use and browse on a diverse range of trees, including non-eucalypts. Revised diet composition analysis provides firmer evidence of the use of trees for browsing.

The researchers have suggested there is an opportunity to update the Coastal IFOA koala browse tree list, including:

- adding a new class in the list hierarchy
- reallocating species to a lower or higher list hierarchy
- delisting existing species
- listing new species.

Notably, the assessment identified three species of grey gum that are important browse species compared to those listed as secondary species, but not as important as those currently listed as primary species. The researchers suggested to classify these species on a new tier between the existing primary and secondary browse trees (referred to in this advice as Primary – Level 2). Under the proposed model, retention would first be directed towards existing primary browse trees, then if these are unavailable or exhausted, towards the grey gums as Primary – Level 2 species, and then in turn, to the secondary browse trees.

Additional information to address the existing knowledge gaps identified in this review will be important evidence to help further understand the merits of an additional class in the list hierarchy (for example, adding more complexity to the rule set) and potential impacts on the retention of other species.

Table 1: Suggested classification changes of koala browse trees for the Upper and Lower North East Coastal IFOA subregions

Species	Current status	Suggested status change
<i>E. seeana</i> (narrow-leaved red gum) + hybrids	Primary	Secondary
<i>E. propinqua</i> (small-fruited grey gum)	Secondary	Primary – level 2
<i>E. punctata</i> (grey gum)	Secondary	Primary – level 2
<i>E. canaliculata</i> (grey gum)	Secondary	Primary – level 2
<i>E. radiata</i> (narrow-leaved peppermint)	Secondary	Remove from list
<i>E. nobilis</i> (ribbon gum)	Secondary	Remove from list
<i>E. obliqua</i> (messmate)	Secondary	Remove from list
<i>E. pauciflora</i> (snow gum)	Secondary	Remove from list
<i>E. andrewsii</i> (New England blackbutt)	Secondary	Remove from list
<i>E. campanulata</i> (New England blackbutt)	Secondary	Remove from list
<i>E. resinifera</i> (red mahogany)	Not listed	Consider listing as Secondary

Knowledge gaps remain

Any changes to the koala browse tree list may impact koalas and other environmental values. Decision makers need further knowledge on the effectiveness of existing Coastal IFOA retention rules to more fully understand these impacts and their potential risks.

At present, there is a knowledge gap around the outcomes of current protocols in terms of retained quantities of browse for koalas and on the tree species profile regenerating following harvesting. Research completed under the Commission's previous Koala Research Program found that canopy composition, assessed using canopy cover, was similar between harvested and unharvested sites.

Further understanding of outcomes will be gained from the Commission's extended Koala Research Program currently underway using drone remote sensing to characterise canopy volume and nutritional quality in unharvested and harvested forests. Changes in tree species composition after harvesting, including selected focal feed trees used by koalas and important non-browse and timber species, are also being assessed under the Coastal IFOA monitoring program. This will contribute further evidence to assess the environmental and wood supply impacts of the proposed changes to the koala browse tree list within the context of the Coastal IFOA operational settings.

Uncertainty still surrounds the importance of some browse tree species (particularly secondary) to koalas and research continues into koala browse preferences and the nutritional consequences of what koalas eat. Despite clear knowledge gaps, koala diets are better understood than the diets of other eucalypt folivores that inhabit state forests and the evidence base continues to grow. As new evidence emerges it will be important to periodically reassess the koala browse tree list.

Within the broader landscape context, a number of recent studies and ongoing monitoring have considered the impacts of timber harvesting and the combined multi-scale landscape protections in the Coastal IFOA on koalas. This work includes:

- [passive acoustic monitoring of koala occupancy trends in north-east NSW](#), ongoing since 2015
- [assessment of change in koala density after selective harvesting](#) with regulations to protect environmental values (under the Commission's previous Koala Research Program)
- [assessment of tree use by koalas after timber harvesting](#) in a mosaic of various forest management zones, including exclusion zones and wildlife clumps.

The Commission will consider the above research as part of the five-yearly review of the Coastal IFOA monitoring program and as appropriate recommend that it is considered in future koala browse tree list decisions made by the Environment Protection Authority (EPA).

More information

This work is part of the Coastal IFOA evaluation program which aims to determine the effectiveness of the practices used in coastal native hardwood state forest in NSW. The report detailing the project findings can be found on the [Commission's website](#).

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