



Koalas and forestry on the NSW north coast

This note summarises recent findings from independent research overseen by the Commission as part of the NSW Koala Strategy 2018-2021.

As part of the *NSW Koala Strategy 2018-2021*, the NSW Government asked the Commission to deliver independent research to better understand how koalas and their habitat are responding to harvesting in state forests on the NSW north coast.



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Figure 1 - Koala research survey sites

Research has been completed assessing koala and habitat responses to **selective harvesting** in north coast state forests (see **Figure 1** for location of study sites).

Overall, the research findings suggest that selective harvesting at the research sites did not adversely impact koala density, nor the nutritional quality of koala habitat.

This research is the most comprehensive conducted to date in NSW on how koalas and their habitat respond to harvesting. The program continues to investigate koala responses to timber harvesting on state forests.

The following sections below provide more information about our findings and our koala research program.

What does the research show about the impacts of selective harvesting?

The researchers worked in collaboration to investigate koala movement, occupancy, density, and the nutritional quality of koala habitat on north coast state forests. Key findings from the research are that:

- koala density was higher than anticipated in the surveyed forests and was not reduced by selective harvesting (see **Figure 2**)
- koala density was mostly similar between state forest and national park sites that had similar forest types, and a mix of old growth and regrowth from historical harvesting
- tree species composition – not tree size – is the key determinant of habitat nutritional quality for koalas and, therefore, the density of koalas that can be supported
- selective harvesting did not significantly change canopy tree species composition at the treatment sites, so is not expected to impact on the nutritional quality of koala habitat.

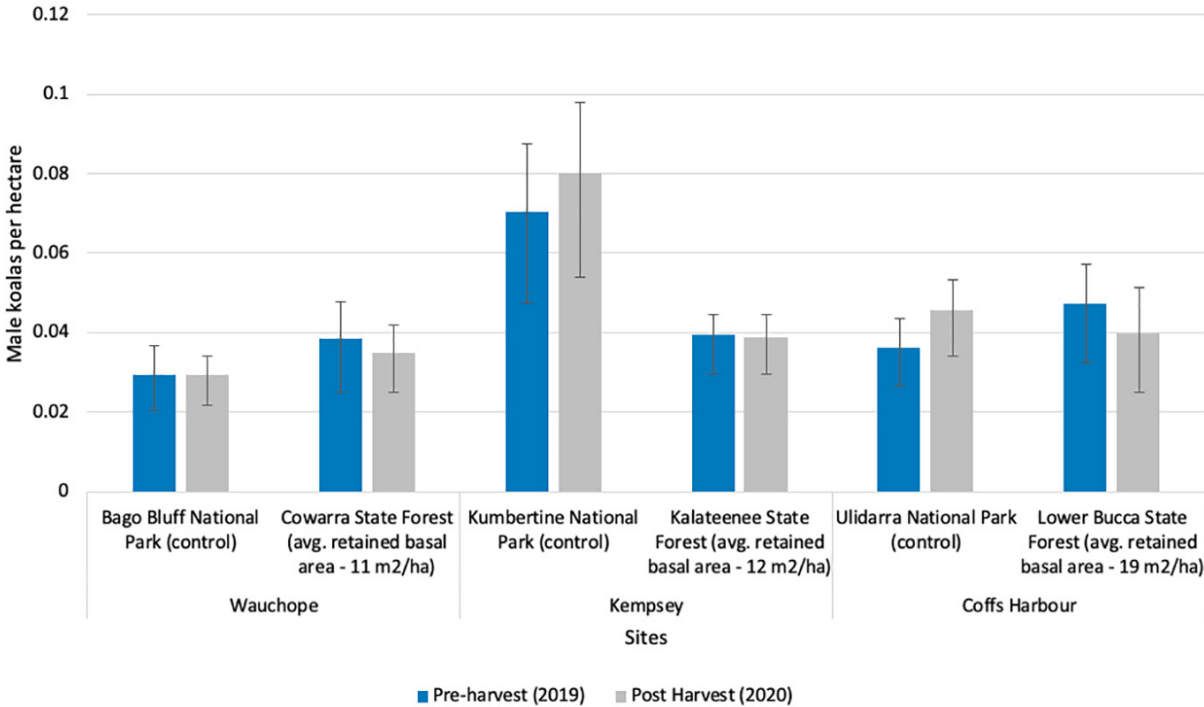


Figure 2 - Mean modelled male koala density pre- and post-harvest at treatment and control sites

Overall, the research indicates the current forestry rules to protect koalas are effective at managing the risks to koalas from selective harvesting at the study sites within NSW north coast state forests.

The findings also support the current approach to native forestry, which focuses on retaining a mix of tree species and sizes across the landscape.

Although this research focuses on the immediate impacts of selective harvesting, researchers also carried out acoustic surveys at three sites that had been more intensively harvested within the previous 5 to 10 years. They found koalas were still using these sites and detection rates and density were comparable to unharvested sites.

What does the research show about koala dietary preferences?

Research into koala diets showed that individual koalas have different dietary preferences, which may be influenced by the available food resources and local conditions. The koalas in the study consumed a range of tree species, although they did show a preference for certain species. Important diet species included tallowwood (*Eucalyptus microcorys*) and small-fruited grey gum (*E. propinqua*), which are already known to be important food resources for koalas and protected accordingly. Notably, the research showed that koalas also preferentially browsed on other species such as spotted gum (*Corymbia maculata*) and ironbarks (*E. paniculata*, *E. siderophloia*), which are not currently protected as a koala food source during timber harvesting operations.

Are there other threats impacting koalas and their habitat?

In the broader context, the Commission reported several significant threats to the long-term survival of koalas across the landscape, particularly due to climate change including:

- prolonged periods of heat stress, increased tree mortality and periodical decreases in leaf moisture associated with more frequent drought periods
- increased probability of high-intensity, large-scale wildfires that kill koalas and severely damage koala habitat.

Further research is needed into the broader implications for koalas of climate-driven changes in fire regimes and drought, including how habitat may shift in response to climate change.

Why was this research undertaken, and how will it be used?

This research program was initiated to address knowledge gaps identified by the NSW Chief Scientist and Engineer around the effects of timber harvesting practices on koalas, both in NSW and nationally.

Evidence from this research will be used to help assess the effectiveness of the NSW Government's Coastal Integrated Forestry Operations Approval (Coastal IFOA), which sets out the rules for native timber harvesting in NSW's coastal state forests. The approval includes a range of koala protections, such as the permanent retention of preferred browse trees in harvesting areas and designation of protected areas that are excluded from harvesting.

Based on the research findings, the Commission has recommended that the tree retention guidelines in the Coastal IFOA should be reviewed to determine whether certain species should be added or removed from the koala browse tree list.

How was the research undertaken?

Acoustic surveys were used to assess koala detection rates and thereby density at nine sites:

- three treatment sites in state forests where selective harvesting occurred
- three sites that had previously been intensively harvested (5 to 10 years ago)
- three control sites in national parks where harvesting did not occur.

Acoustic arrays at each of the nine sites covered a total of 400 hectares, located largely in the North Coast Koala Management Region.

The basal area retained at the treatment sites ranged from an average of 11 to 19 square metres per hectare, which exceeds the minimum average of 10 square metres of basal area per hectare that must be retained after harvesting in regrowth forests under current rules.

Habitat nutritional quality was determined from chemical analysis of leaf samples for 58 sites across the regeneration forestry zone on the north coast, representing the most common forest types in the region.

Researchers also tracked tagged koalas using GPS and collected faecal pellets from the tracked koalas and from other targeted searches between Kempsey and south of Taree.

Analysis of the DNA and chemicals from these pellets determined exactly which tree species koalas were eating and their nutritional contribution.

Who is involved in this research?

The research was carried out by eminent scientific researchers from the Australian National University, Western Sydney University, and the Department of Primary Industries Forest Science Unit.

To guide the broader research program and help select the successful research proposals to ensure delivery of robust, and scientifically credible research, we have established an expert panel comprising koala and forestry experts.

What other research is being done?

The program is continuing to expand its assessment of the impact of timber harvesting practices on koalas and their habitat in state forests across NSW.

In addition, a research project has been completed looking at the impact of the 2019-20 wildfires on koalas and their habitat. The research used existing pre-fire data and analysis combined with targeted sampling after the wildfires to opportunistically address knowledge gaps. The results of this research project are summarised in a [final report](#) available on the [Commission's website](#).

Where to find more information?

Researchers engaged under our Koala Research Program publish their research in peer-reviewed scientific journals. The results of the research on koala density outlined in this note were recently published in the Nature Portfolio of Journals titled [Regulated timber harvesting does not reduce koala density in north-east forests of New South Wales](#).

Results from the GPS study of koalas have been published in the Wildlife Research journal titled [Tree use by koalas after timber harvesting in a mosaic landscape](#).

Summary reports outlining the key findings of all our Koala Research Program projects can also be found on the [Commission's website](#). If you would like to receive updates regarding this work, you can also sign up to our [mailing list](#) via our website.

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