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The plan to protect wildlife displaced by the Hume Highway has failed

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Hundreds of large old trees were removed when the Hume Highway was widened. Brian Yap/Flickr, CC BY-NC

It's no secret that human development frequently comes at a cost to other creatures. As our urban footprint expands, native habitat contracts. To compensate for this, most Australian governments require developers to invest in biodiversity offsetting, where habitat is created or protected elsewhere to counterbalance the impact of construction.

Although biodiversity offsetting is frequently used in Australia – and is becoming increasingly popular around the world – we rarely know whether offsets are actually effective.

That's why we spent four years monitoring the program designed to offset the environmental losses caused by widening the Hume Highway between Holbrook and Coolac, New South Wales. Our research has found it was completely ineffective.

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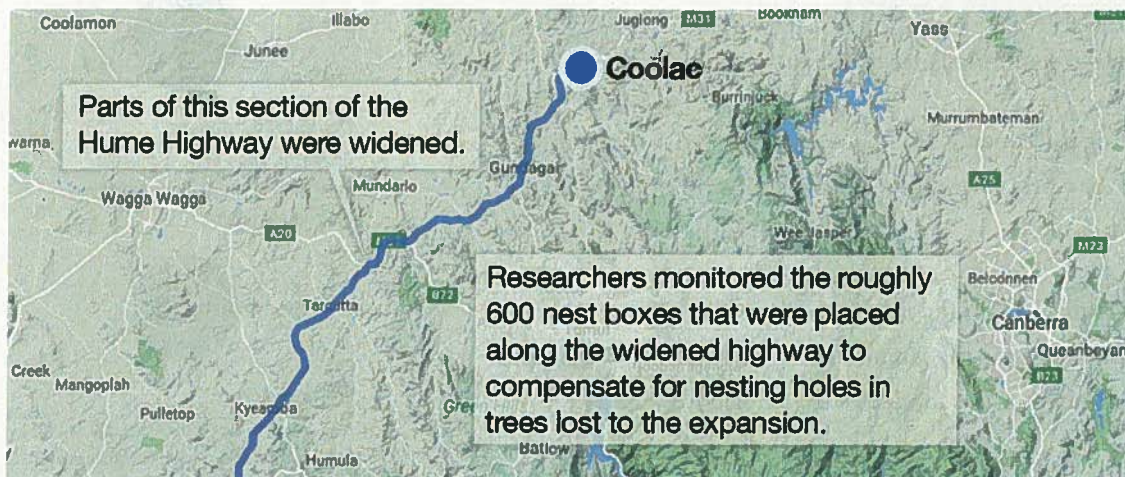


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Researchers monitored hundreds of nest boxes used to
offset habitat loss. Mason Crane, Author provided





Map courtesy Google/The Conversation, CC BY-ND

Trading trees for boxes

The roadworks required the removal of large, old, hollow-bearing trees, which are critical nesting sites for many animals, including several threatened species. To compensate for these losses, the developer was required to install one nest box for every hollow that was lost – roughly 600 nest boxes were installed.



Wild honeybees occupied many nest boxes.
Mason Crane, Author provided

Many of the boxes were specifically designed for three threatened species: the squirrel glider, the superb parrot and the brown treecreeper. We monitored the offset for four years to see whether local wildlife used the nest boxes.

We found that the nest boxes were rarely used, with just seven records of the squirrel glider, two of the brown treecreeper, and none of the superb parrot. We often saw all three species in large old tree hollows in the area around the boxes we monitored.

Even more worryingly, almost 10% of the boxes collapsed, were stolen or otherwise rendered ineffective just four years after being installed. Perversely, we found that invasive species such as feral bees and black rats frequently occupied the nest boxes.

The offset clearly failed to deliver the environmental outcomes that were promised. Indeed, researchers have been concerned for some time now that offsetting can be misused and abused.

What can be done?

It's worth noting that research supports using nest boxes as a habitat replacement. However, they may never be effective for species such as the superb parrot. It's not quite clear why some animals use nest boxes and others don't, but earlier monitoring projects in the same area found superb parrots consistently avoid them.

Still, concrete steps can – and should – be taken to improve similar offset programs.

First, the one-to-one ratio of nest boxes to tree hollows was inadequate; far more nest boxes needed to

be installed to replace the natural hollows that were lost.

There also was no requirement to regularly replace nest boxes as they degrade. It can take a hundred years or more for trees to develop natural hollows suitable for nesting wildlife. To truly offset their removal, thousands of boxes may be required over many decades.

Second, nest boxes clearly cannot compensate for the many other key ecological values of large old trees (such as carbon storage, flowering pulses or foraging habitat). This suggests that more effort is needed at the beginning of a development proposal to avoid damaging environmental assets that are extremely difficult to replace – such as large old trees.

Third, where it is simply impossible to protect key features of the environment during infrastructure development, more holistic strategies should be considered. For example, in the case of the woodlands around the Hume Highway, encouraging natural regeneration can help replace old trees.

Tree planting on farms can also make a significant contribution to biodiversity – and some of these may eventually become hollow-bearing trees. A combination of planting new trees and maintaining adequate artificial hollows while those trees mature might be a better approach.

Being accountable for failure

When an offset program fails, it's unlikely anyone will be asked to rectify the situation. This is because developers are only required to initiate an offset, and are not responsible for their long-term outcomes.

In the case of the Hume Highway development, the conditions of approval specified that nest boxes were to be installed, but not that they be effective.

Despite the ecological failure of the offset (and over A\$200,000 invested), the developer has met these legal obligations.

This distinction between offset compliance and offset effectiveness is a real problem. The Australian government has produced a draft policy of outcomes-based conditions, but using these conditions isn't mandatory.

The poor results of the Hume Highway offset program are sobering. However, organisations like



An old hollow-bearing river red gum. Trees like this are vital habitat for many species. Peter Halasz/Wikimedia commons, CC BY-SA

Roads and Maritime Services are to be commended for ensuring that monitoring was completed and for making the data available for public scrutiny – many agencies do not even do that.

Indeed, through monitoring and evaluation we can often learn more from failures than successes.

There are salutary lessons here, critical to ensuring mistakes are not repeated.

 **Biodiversity** **Birds** **Biodiversity offsets** **Trees** **Parrots**

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