

One size doesn't fit all for conserving our iconic kangaroos

March 8 2021, by Dr Holly Sitters



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While kangaroos are easier to spot than many of Australia's more secretive native species, a suite of threats currently face these magnificent animals.

The 2019-20 [fire](#) season was exceptional because, according to modern records, it consumed forests that had never before burnt at such vast scales.

More than [200,000 kangaroos are thought to have died during or soon after the](#) fires in Victoria, where paradoxically, permits have been issued to kill almost 450,000 kangaroos since 2018. At that time, the state's total population was estimated to be 1.4 million.

Although these figures are alarming, this is not another grim conservation tale.

This year, [La Niña climate patterns](#) have brought Victoria's wildlife and fire crews some respite in the form of summer rain and cooler daytime temperatures. And the Victorian Government's Department of Environment Land, Water and Planning has among the most sophisticated approaches to ecological fire management in the world, having forged partnerships with researchers and community groups over recent decades.

My team, including co-researchers Lauren Delaney and Dr. Julian Di Stefano, works with land managers in Victoria and South Australia to find out where and when to apply planned fire for the benefit of kangaroos and other animals.

Our new research has found that kangaroos prefer a mix of long-unburnt and recently burnt areas within large expanses of woodland or forest.

It's likely that kangaroos enjoy the shelter provided by shrubs and large trees in long-unburnt vegetation, alongside fresh, green ephemeral foods in recently burnt areas.

However, the kangaroos' preferences changed where remnant patches of

vegetation were surrounded by pasture, crops or small towns.

In fragmented landscapes, kangaroos did not prefer a mix of fire ages, presumably because they substituted pasture grasses for post-fire ephemerals.

We found consistent patterns in four species: eastern grey [kangaroo](#) (*Macropus giganteus*), western grey kangaroo (*Macropus fuliginosus*), red-necked wallaby (*Notamacropus rufogriseus*) and—to our surprise—the yellow-footed antechinus (*Antechinus flavipes*), a 45-gram shrew-like marsupial.

The yellow-footed antechinus is famed for its unusual sexual exploits, involving the death of all males following an annual winter mating season. After the males die, pregnant females must search for a suitable den in a tree hollow or log where they rear their young.

Fire may cause a shortage of these den sites if it consumes big, old trees which provide lots of hollows.

While females are fairly sedentary, a radio-tracking study showed that males live their short lives to the full and may leave the relative safety of native woodland to find food in nearby pasture.

Nonetheless, it was harder to wrap our heads around the notion that the dainty antechinus would venture into paddocks more often than the much larger and more mobile kangaroos and wallabies—but our results indicate that the four species share an ability to take advantage of a range of resources.

We used wildlife cameras to survey the animals on Gunditjmara Country in the heathy woodland of a quiet corner of southwest Victoria, where remnant vegetation is surrounded by pasture, pine and blue gum

plantations.

Using a sprawling and dilapidated house in Casterton as a base for our fieldwork, we visited 70 sites and tied cameras near the base of two trees per site. The cameras are triggered automatically by motion and heat, and we placed a smelly bait mix of oats, peanut butter and golden syrup in front of the camera to encourage animals to hang out long enough for us to identify them with confidence.

After 25 days, we returned to pick up the cameras and celebrate our haul of tens of thousands of animal images.

For animals like koalas and echidnas, identification is easy—but Gunditjmarra Country features several mammals that are very difficult to distinguish from one another.

Eastern and western grey kangaroos may look identical to the untrained eye, but with practice and help from kangaroo experts we gradually picked up the subtle differences in ear shape and fur colour.

We hope that the outcomes of the many days we spent scratching our heads while looking at grainy images will help land managers decide where and when to use planned fire (or fire suppression) to benefit kangaroos and other less-well-known species.

Although two kangaroos, the wallaby, and the antechinus are not currently listed as threatened or endangered, increasingly frequent wildfires, together with increases in the numbers of kangaroos that can be killed for commercial profit, are likely to be having dramatic impacts on population sizes.

Biodiversity conservation during this time of rapid environmental change can sometimes feel like trying to hold back a tsunami with the palm of

your hand.

However, tailoring ecological fire management strategies according to whether native vegetation occurs as a large, continuous block or in fragmented remnants may help preserve one of Australia's iconic species for generations to come.

More information: Lauren Delaney et al. Mammal responses to spatial pattern in fire history depend on landscape context, *Landscape Ecology* (2021). [DOI: 10.1007/s10980-020-01186-3](https://doi.org/10.1007/s10980-020-01186-3)

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