

Dingoes to the rescue?

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Could dingoes be the answer to controlling the havoc red foxes wreak on native and domestic animal populations?

Dingoes are a polarising force in Australian society, viewed as both victim and villain. The introduced red fox, however, has few friends among native animals or farmers.

Now, the first study to look at the effects of dingo distribution and abundance on fox populations has found that fox numbers are reduced in areas where dingo numbers are high.

The article, "Top predators constrain mesopredator distributions," published in *Nature Communications* today examines the relationship between foxes and dingoes as part of a wider study investigating the effects of [apex predators](#) on smaller mesopredators.

Lead researcher Dr Thomas Newsome, from Deakin University's Centre for Integrative Ecology (CIE) and the University of Sydney, said the new research showed fox numbers were reduced where dingoes were high in abundance, compared to areas where foxes existed alongside fewer dingoes.

"What's significant is that fox numbers were reduced in the centre of the dingo's geographic range but at the edges of the range the suppressive effect on foxes significantly declined," Dr Newsome said.

The research, supported by other Australian, and several international

universities, also looked at predator pairs in the US (wolves and coyotes) and Europe (wolves and golden jackals) and found similar results.

Dr Newsome said that further studies would help confirm the findings.

"We need to think about the broader geographical territory of the apex predators and where ecologically effective densities are being achieved.

"Our investigation suggests studies assessing the strength of top-down mesopredator control should consider whether the mesopredator is located on the periphery or in the core of the top predator's range, and whether the top predator has reduced abundance, destabilised social structure or a sporadic distribution," he explained.

"If these factors aren't taken into account, we could underestimate the potential effects of top predators on ecological communities and inhibit conservation and restoration efforts."

Dingoes are classified as apex predators due to their position at the top of the food chain, and can control fox numbers through direct predation – chasing and killing them – as well as through fear, which can alter foxes' activity and feeding patterns.

Dr Newsome said foxes and other introduced animals were blamed for the extinction of at least 20 native mammals in Australia since their introduction following European settlement.

"Foxes kill many threatened small and medium sized mammal species – including bilbies and small wallabies – and they also spread diseases and impact on agriculture," he said.

"Dingoes don't pose the same risk to these threatened [mammal species](#), as these mammals have been able to develop effective anti-predator

strategies to coexist with dingoes since they were introduced around 4,500 years ago.

"Unfortunately, our native mammals have not developed sufficient anti-[predator](#) strategies to coexist with foxes – essentially making them sitting ducks."

The research will add to the growing body of research about the functional role that dingoes, and other apex predators such as wolves, play in ecosystems around the world.

"Apex predators can benefit ecosystems by controlling mesopredators and other prey species. This has flow-on effects to other populations and even plant growth," Dr Newsome said.

"As an example, when wolves were removed from large areas of the US, deer numbers increased, which meant that plant populations declined, and bears suffered because their food source dwindled.

"When wolves were reintroduced to Yellowstone National Park, it helped to shift the area back into relative balance."

However, human modifications, like the widespread clearance of land for livestock grazing and cropping, made it difficult for dingoes and wolves to recolonise their former habitats, Dr Newsome added.

"If we want to harness the ecological benefits of dingoes, we need to provide suitable areas for them to recolonise.

"This means providing areas of suitable habitat that are large enough to maintain multiple packs of dingoes and wild prey, such as kangaroos."

Acknowledging the tension between farmers and dingoes, Dr Newsome

said that allowing adequate space and prey for dingoes, as well as accepting occasional stock losses in return for rising net benefits, would mean minimal impact on the agricultural industry.

"If dingoes suppress kangaroos, it could lead to more vegetation and better grazing conditions for livestock," he said

"Red foxes are also estimated to cause around \$17 M annually in damage to the sheep industry alone, and after accounting for other impacts they cost the Australian economy \$227.5 M annually."

Dr Newsome said the best way to help dingoes recolonise larger parts of Australia was to let them do it naturally.

"This research shows that apex predators like [dingoes](#) and wolves need large, continuous territories in order to effectively control the balance of their ecosystems."

More information: Thomas M. Newsome et al. Top predators constrain mesopredator distributions, *Nature Communications* (2017). [DOI: 10.1038/ncomms15469](https://doi.org/10.1038/ncomms15469)

Provided by Deakin University

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