

Animal trapping records reveal strong wolf effect across North America

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Scientists have used coyote and red fox fur trapping records across North America to document how the presence of wolves influences the balance of smaller predators further down the food chain.

From Alaska and Yukon to Nova Scotia and Maine, the researchers have demonstrated that a "wolf effect" exists, favoring [red foxes](#) where wolves are present and [coyotes](#) where wolves are absent.

This effect requires that enough wolves be present to suppress coyotes over a wide area. Fur trapping records from Saskatchewan and Manitoba reveal that where wolves are absent in the southern agricultural regions of each province, coyotes outnumber foxes on average by 3-to-1.

However, where wolves are abundant in the north, the balance swings dramatically in favor of foxes on average by 4-to-1 and at an extreme of 500-to-1 at one site.

In between is a 200-kilometer (124-mile) transition zone where too few wolves are present to tip the balance between coyotes and foxes.

The results of the study by Thomas Newsome and William Ripple in the Oregon State University Department of Forest Ecosystems and Society were published today in the *Journal of Animal Ecology* by the British Ecological Society.

"As wolves were extirpated across the southern half of North America, coyotes dramatically expanded their range," said Newsome, a post-

doctoral researcher at Oregon State. "They were historically located in the middle and western United States, but they dispersed all the way to Alaska in the early 1900s and to New Brunswick and Maine by the 1970s."

"So essentially coyotes have been dispersing into wolf and red-fox range in the north but also into areas where wolves are absent but red fox are present in the East," Newsome added.

Newsome came to the United States on a Fulbright scholarship from Australia where he earned a Ph.D. from the University of Sydney and specialized in the study of dingoes – that continent's top predator. There's a debate among Australians, he said, about the potential role of dingoes in suppressing introduced pests that have already decimated wildlife there.

"Over the last 200 years, Australia has had the highest extinction rate in the world," Newsome said. "The debate is about whether the dingo can provide positive ecological benefits. Where dingoes have been removed, the impacts of introduced red foxes and feral cats have been quite severe on native fauna."

Dingoes are managed as a pest in New South Wales, the country's most populous state. To reduce dingo predation in the livestock industry, Australia also maintains the world's longest fence, which runs for 5,500 kilometers (3,400 miles) in an attempt to exclude dingoes from almost a quarter of the continent.

In North America, the effect of wolves on coyotes and red foxes provides a natural case study that can be instructive for Australians. "Australians can learn a lot from how wolves are managed in North America, and Americans can learn from the ecological role of the dingo," Newsome said.

As coyotes have expanded in North America, they have become a major cause of concern for the livestock industry. In the United States in 2004, researchers estimated annual losses due to coyote predation on sheep and cattle at \$40 million. To reduce those damages, the Wildlife Service of the U.S. Department of Agriculture has a program to reduce coyote numbers, an effort that has drawn criticism from conservation groups.

In reviewing the fur trapping data from two U.S. and six Canadian jurisdictions, Newsome and Ripple eliminated potential sources of bias such as records from fur farms that raise foxes. The fur prices of coyotes and red foxes are also strongly correlated, and the two species occupy much of the same types of habitat, so they are equally likely to be targeted and caught in hunters' traps.

"This study gives us a whole other avenue to understand the ecological effects of wolves on landscapes and animal communities," said Ripple. He has studied the influence of carnivores on their prey—such as deer and elk—and on vegetation from aspen trees to willows. He and his colleagues have shown that the removal of top predators can cause dramatic shifts within ecosystems.

Wolves are naturally recolonizing many areas of the United States following their reintroduction into Yellowstone National Park and surrounding areas in 1995. Scientists are studying wolf interactions with other species, and in particular, there is interest in determining whether recolonizing [wolves](#) will suppress coyote populations and have cascading effects on red foxes and other species.

Provided by Oregon State University

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