

Cougars could save lives by lowering vehicle collisions with deer

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A cougar standing over its prey. Credit: Brian Kertson/Washington Department of Fish and Wildlife

You would never guess it from their soft eyes and timid demeanor, but the swift-footed deer is North America's most dangerous mammal to humans.

Each year [deer](#) cause 1.2 million vehicle collisions in the U.S., triggering more than 200 deaths, some 29,000 injuries and \$1.66 billion in costs associated with vehicle damage, medical bills and road cleanup.

These staggering figures are in part because deer's natural predators—[large carnivores](#) such as wolves and cougars—have declined in population, leaving large ungulates like deer to reproduce mostly unchecked.

A team including University of Washington's Laura Prugh has for the first time begun to quantify the economic and social impact of bringing back large carnivores. Using cougars and their value in reducing deer-vehicle collisions as a case study, the researchers found that within 30 years of cougars recolonizing the Eastern U.S., large cats

could thin deer populations and reduce vehicle collisions by 22 percent—each year preventing five human fatalities, 680 injuries and avoiding costs of \$50 million.

The study is published online this week in the journal *Conservation Letters*. The student-led project was initiated during a community ecology class Prugh taught in 2014 at the University of Alaska Fairbanks. Lead author Sophie Gilbert, now a postdoctoral researcher at the University of Alberta, will start in the fall as an assistant professor at the University of Idaho.

"The important take-home is that there can be very tangible benefits to having large carnivores around—economic and social benefits, not just ecological benefits," said Prugh, a UW assistant professor of quantitative wildlife sciences in the School of Environmental and Forest Sciences.

"Carnivores are so controversial and there's a lot of fear, anxiety and resistance when they are reintroduced or recolonize an area. We are hoping that showing people how their lives could really benefit in a tangible way from having large carnivores around could help people become more accepting of living with them."

Cougars, also called mountain lions, panthers and pumas, used to live throughout most of the U.S. and Canada. State-sponsored bounty hunts to protect livestock and humans from the cats led to their complete removal from the Midwest and eastern states by the early 20th century.

Breeding populations have since recolonized their former habitats in South Dakota, North Dakota and Nebraska, and individual males have made it to Connecticut and, most recently, Tennessee. It is likely just a matter of time before new breeding populations pop up farther east, Prugh said.

In the meantime, without as many predators, the

deer population has grown across the U.S., particularly in the eastern states. While these ungulates provide ample hunting opportunities, an overabundance of deer has led to more collisions with vehicles as well as impacts on landscapes and vegetation from deer's herbivore diet.

"I think everyone on the East Coast has either hit a deer or knows somebody who's hit a deer, so it's a very real problem for people," Prugh said. "An overabundance of ungulates might be a hunter's paradise, but it comes with problems as well."

The researchers calculated the cougars' impact by comparing white-tailed deer population densities and the numbers of deer killed by vehicles with and without cougar predation.

Their models showed that cumulatively over 30 years, 155 human deaths and more than 21,000 injuries could be prevented by the presence of cougars in 19 eastern states. A single cougar would kill 259 deer over its average six-year lifespan, preventing eight collisions and saving nearly \$40,000 in associated costs.

The researchers were conservative in their estimates of the benefits cougars could bring. They assumed that three out of four deer killed by cougars would have died from other causes without cougars present, thereby reducing the impact of cougars on deer mortality by 75 percent. They also limited the possible range for cougars to large forested areas, although cougars could probably live in rural and suburban areas as they do in western states. Finally, the researchers assumed cougars would prey on deer at the same rate in western and eastern states. In reality, cougars would likely hunt deer at a higher rate in eastern states, because out west they have more prey options such as elk.

"The modeling framework and assumptions we made stacked the cards against the cougars being able to reduce the [deer population](#). We didn't have any expectations that cougar predation would be enough to drive the deer down, and yet it did," Prugh said.

"Cougars are deer specialists and they target

adults. With a long-lived species like deer, removing adults in prime breeding age can really have an impact on population growth."

The researchers were able to compare their modeled results with an actual example in South Dakota, where a viable cougar population lives in the Black Hills. The data clearly showed that after cougars repopulated the region in the 1990s, deer-vehicle collision rates markedly dropped. This real-life test case was strong evidence of a trend that could happen elsewhere, Prugh said.

The authors acknowledge that re-establishing cougars across the U.S. has its costs. Attacks on humans, pets and livestock could become more common, though their estimates show that cougars would actually save five times the number of people they would kill by way of preventing deer-vehicle collisions. The researchers next hope to complete full cost-benefit analyses in smaller subsections of the country where [cougars](#) are present.

More information: Sophie L. Gilbert et al, Socioeconomic Benefits of Large Carnivore Recolonization Through Reduced Wildlife-Vehicle Collisions, *Conservation Letters* (2016). [DOI: 10.1111/conl.12280](https://doi.org/10.1111/conl.12280)

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