

Why killing coyotes doesn't make livestock safer

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Few Americans probably know that their tax dollars paid to [kill 76,859 coyotes](#) in 2016. The responsible agency was Wildlife Services (WS), part of the U.S. Department of Agriculture. Its [mission](#) is to "resolve wildlife conflicts to allow people and wildlife to coexist." This broad mandate includes everything from reducing bird strikes at airports to curbing the spread of rabies.

Controlling predators that attack livestock is one of the agency's more controversial tasks. WS uses nonlethal techniques, such as livestock guard dogs and [fladry](#) – hanging strips of cloth from fences, where they flutter and deter predators. But every year it also kills tens of thousands of predators, including bears, bobcats, coyotes, foxes, hawks, cougars and wolves.

However, there is no clear evidence that lethal control works to reduce human-predator conflict. In fact, it can even make the problem worse. At the same time, research shows that [predators play key roles](#) in maintaining healthy ecosystems. As a conservation biologist specializing in human-wildlife conflicts, I see growing evidence that it is time to reconsider lethal control.

Warfare on the range

Coyotes have been a target ever since European explorers first arrived in their territory centuries ago. Nonetheless, their range has [expanded](#) from the western plains across most of the continent.

The most common reason for killing coyotes is to reduce [predation](#) of livestock, such as sheep and calves. In a 2015 [USDA report on sheep losses](#), ranchers reported how many of their animals died in 2014 and how they died. Twenty-eight percent of adult sheep losses and 36 percent of lamb losses were attributed to predators. Of those animals, ranchers stated that 33,510 adult sheep (more than half of total predation losses) and 84,519 lambs (nearly two-thirds of all predation losses) were killed by coyotes.

According to the [American Sheep Industry Association](#), about UD\$20.5 million of ranchers' losses in 2014 (roughly one-fifth of their total losses) were attributed to coyotes. Importantly, however, these numbers were based on self-reported data and were not verified by wildlife

professionals. External review would be useful because even experienced ranchers may have trouble determining in some cases whether a sheep was killed by a [coyote](#) or a dog (dogs are second only to coyotes in reported predation on livestock), or died from other causes and later was scavenged by coyotes.

To keep coyotes in check, WS employees set neck snares and other traps, shoot coyotes on the ground and from planes and helicopters, arm sheep with [collars containing liquid poison](#) and distribute [M-44 "bombs"](#) that inject sodium cyanide into the mouths of animals that chew on them.

As in warfare, there is collateral damage. M-44s [killed more than 1,100 domestic dogs between 2000 and 2012](#). Scientists have also criticized WS for [unintentionally killing numerous animals and birds](#), including federally protected golden and bald eagles, while failing to do any studies of how its actions affected nontarget species. Early this year the American Society of Mammalogists [called for more scientific scrutiny](#) of the policy of killing large predators.

How effective is lethal control?

It is understandable for struggling ranchers to blame coyotes for economic losses, since kills leave tangible signs and killing predators seems like a logical solution. However, a widely cited 2006 study [called coyotes scapegoats](#) for factors that were more directly related to the decline of sheep ranching in the United States.

The author, [Dr. Kim Murray Berger](#), who was then a research biologist with the Wildlife Conservation Society, built and tested a series of statistical models to explain the declining number of sheep being bred in the United States. She found that variables including the price of hay, wage rates and the price of lamb explained most of the decline, and that

the amount of money spent on predator control had little effect.

Other research indicates that even if predation is one factor in ranchers' economic losses, lethal control is not the best way to reduce it.

One 2016 analysis reviewed studies that [compared lethal and nonlethal strategies](#) for controlling livestock predation. Lethal methods ranged from civilian hunts to government culls. Nonlethal methods included fladry, guard animals, chemical repellents and livestock protection collars. The review found that nonlethal methods generally reduced livestock predation more effectively, and that predation actually temporarily increased after use of some lethal methods.

Why would predation increase after predators are killed? When pack animals such as coyotes, dingoes and wolves are killed, the social structure of their packs breaks down. Female coyotes become more likely to breed and their pups are more likely to survive, so their numbers may actually increase. Packs generally protect territories, so breaking up a pack allows new animals to come in, raising the population. In addition, some new arrivals may opportunistically prey on livestock, which can increase predation rates.

These findings extend beyond the United States. A three-year study in [South Africa](#) found that using nonlethal methods to protect livestock from jackals, caracals and leopards cost ranchers less than lethal methods, both because less predation occurred and because the nonlethal methods cost less.

In Australia dingoes occupy a similar ecological niche to coyotes and are similarly targeted. In a recent [case study at a cattle station](#), researchers found that ceasing all lethal and nonlethal predator control reduced predation of cattle by dingoes as the social structure of the resident dingoes stabilized.

Even research by USDA supports this pattern. In a recent study, researchers from several universities, USDA's [National Wildlife Research Center](#) and the nonprofit advocacy group [Defenders of Wildlife](#) analyzed [wolf predation rates for sheep producers](#) on public grazing lands in Idaho. Predation was 3.5 times higher in zones where lethal control was used than in adjacent areas where nonlethal methods were used.

A high-stakes placebo

Overuse of subsidized [predator control](#) is comparable to primary care doctors [overprescribing antibiotics to human patients](#). Patients often demand antibiotics for common colds, although doctors understand that these infections are caused mainly by viruses, so antibiotics will be ineffective. But receiving a prescription makes patients feel that their concerns are being addressed. Lethal control is a high-stakes placebo for the problems that ail ranchers, and misusing it can increase problems for ranchers and the ecosystems around them.

Human-wildlife conflict is a complex issue. Often, as some colleagues and I showed in our recent book, "[Human-Wildlife Conflict](#)," the real problem is confrontations between humans about how to deal with wildlife.

This means that we need to choose prevention and mitigation methods carefully. If cultural values and prevailing community attitudes are not taken into account, attempts to change ranching practices could increase hostility toward predators and make it harder for conservation groups to work with ranchers.

Federal employees at Wildlife Services are under tremendous pressure from the agricultural industry. And farmers and [ranchers](#) often act based on deeply rooted traditions and cultural attitudes. It rests with wildlife

professionals to use current and well-grounded science to address human concerns without harming the environment.

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