

Wildlife Services

Protecting People
Protecting Agriculture
Protecting Wildlife

National Wildlife Research Center

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Predator Damage Management



Contact Information:

Dr. Julie K. Young
Supervisory Research Wildlife Biologist
Predator Research Station
Utah State University
Room 163, BNR Building
Logan, UT 84322-5295
Phone: (435) 797-1348
FAX: (435) 797-0288
julie.k.young@aphis.usda.gov
www.aphis.usda.gov/wildlife_damage/
nwrc

Major Cooperators:

- Utah Division of Wildlife Resources
- Utah State University
- Montana Fish, Wildlife and Parks
- Colorado Parks and Wildlife
- Wyoming Department of Game and Fish
- U.S. Army
- U.S. Forest Service
- Welder Wildlife Foundation
- Wildlife Conservation Society
- Wyoming Animal Damage Management Board
- Wyoming Department of Agriculture

Groups Affected By These Problems

- Environmental organizations
- Land management agencies
- Livestock producers
- U.S. citizens, urban and rural residents
- Wildlife managers

National Wildlife Research Center Scientists Study Predation and New Ways to Protect Livestock and People

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research organization devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and socially responsible methods, tools, and techniques.

Data on carnivore population dynamics, ecology, and behavior are necessary to understand predation patterns on livestock, game species, threatened and endangered species, and in urban areas. These data are also needed for effective depredation management, but significant gaps of knowledge exist with regard to predator-prey, predator-livestock, and predator-predator relationships. NWRC is adopting a multi-disciplinary approach to study interactions among predators and the impact of predators and predator removal on ecosystems, wildlife population dynamics, and livestock predation.

The development of new predator management tools to reduce livestock losses and protect public safety is also a high priority for NWRC. Livestock depredation costs producers approximately \$138 million each year. For the sheep and lamb industry alone, predators account for approximately 36 percent of the total losses from all causes. Concerns for public health and safety, as well as animal welfare, have resulted in wildlife managers seeking methods to reduce the risk of conflicts associated with predators. Research conducted by scientists at NWRC's field station in Logan, Utah, is focused on finding new tools and techniques to reduce conflicts with carnivores. In addition, NWRC researchers are developing improved methods for capturing carnivores and monitoring their behaviors and movements.

Applying Science and Expertise to Wildlife Challenges

Calf Mortality and Producer Detection Rates—To investigate factors influencing calf mortality and producer detection rates of predation, researchers monitored 930 radio-tagged domestic calves at two sites in New Mexico and Arizona. Study areas differed in grazing practices, density of predators (mountain lions, black bears, coyotes, and Mexican wolves), and the amount of effort spent monitoring cattle. Calves killed by predators were, on average, 25 days younger than surviving calves. The results indicate that year-round calving, especially in areas with high predator densities, is subject to higher losses primarily because calves are exposed to mortality agents for longer periods rather than having higher natural rates of mortality. Researchers also found a significant difference in producer detection rates of predation likely due to differences in the intensity of monitoring cattle. These findings support changing husbandry practices to limit calving to a seasonal endeavor and indicate that paying producers to maintain sustainable predator populations may be a better compensation strategy than paying producers based on verified losses.

Snowmobile Trails as Corridors for Coyote Movement—Increased snowmobile use and subsequent snow compaction in Canada lynx recovery areas are a concern for agencies responsible for recovery efforts. Researchers observed that coyotes used compacted snow trails as transit routes for approximately 35 percent of their travel distance. Coyotes also traveled closer to snow-compacted trails than expected. By facilitating coyote access to winter lynx habitats, snowmobile use may inadvertently contribute to increased competition between the two species. These results support the need for wildlife management agencies to consider winter recreational use patterns that may influence the distribution of coyotes in lynx reintroduction areas.

Predation on Endangered Black-Footed Ferrets—Researchers investigated whether landscape features could be used to predict predation risk from coyotes and great horned owls on endangered black-footed ferrets. Exposure to areas near likely owl perches



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reduced ferret survival, but landscape features potentially associated with coyote movements had no appreciable effect on survival. These results suggest that future decisions concerning the location of reintroduction sites should consider the location and distribution of landscape features potentially used by great horned owls.

Sampling Wolves and Coyotes—Monitoring wolves and coyotes in the wild is challenging because they are notoriously wary of humans and novel items in their environment. To identify potential alternatives for sampling these animals, researchers tested whether lures and rubbing posts could be used to monitor coyote and wolf populations. The rub stations successfully gathered enough hair samples to extract DNA. The researchers note that rub stations can be strategically placed in the environment in accordance with specific sampling designs and provide an inexpensive way to monitor populations, estimate abundance, and explore genetic diversity.

Improving Forensic DNA Identification of Predators—WS operations personnel need to identify predator species from depredation events and forensic genetic techniques offer tremendous potential. Unfortunately, non-invasive DNA (e.g., saliva, feces) degrades rapidly and to varying degrees depending on field conditions. Therefore, degradation of non-invasive DNA is the limiting factor for identifying predators from depredated carcasses. A study at the NWRC Utah Field Station in Logan, Utah, and the Wildlife Science Center in Columbus, Minnesota, is underway to determine degradation rates of DNA (saliva) left behind by predators on depredated sheep and calves and identify methods of optimal field collection for depredation events that increase success rates of predator identification in the laboratory.

Livestock Protection Dogs in Areas with Wolves and Grizzly Bears—Livestock protection dogs have been used in the United States for decades as a non-lethal tool to protect livestock from coyote depredation. WS research is investigating whether select breeds of livestock protection dogs, such as the larger breeds still used in Europe, are effective at reducing livestock losses to larger carnivores, such as wolves and grizzly bear. Field work began in January 2013 and will continue for several years. The goal of the study is to identify the best breed(s) of livestock protection dogs to guard herds from grizzly bears and wolves and maintain this non-lethal tool for producers.

Selected Publications:

ATWOOD, T. C., J. K. YOUNG, J. P. BECKMANN, S. W. BRECK, J. FIKE, O. E. RHODES Jr., and K. D. BRISTOW. 2011. Modeling connectivity of black bears in a desert sky island archipelago. *Biological Conservation* 144:2851-2862.

AUSBAND, D. E., J. K. YOUNG, B. FANNIN, M. S. MITCHELL, J. L. STENGLEIN, L. P. WAITS, and J. A. SHIVIK. 2011. Hair of the dog: Obtaining samples from coyotes and wolves noninvasively. *Wildlife Society Bulletin* 35:105–111.

BARUCH-MORDO, S., S. W. BRECK, K. R. WILSON, and J. BRODERICK. 2011. The carrot or the stick? Evaluation of education and enforcement as management tools for human-wildlife conflicts. *PLoS ONE* 6:e15681.

BRECK, S. W., B. M. KLUEVER, M. PANASCI, J. OAKLEAF, D. L. BERGMAN, W. BALLARD and L. HOWERY. 2011. Factors affecting predation on calves and producer detection rates in the Mexican wolf recovery area. *Biological Conservation* 144:930-936.

GESE, E. M., P. S. MOREY, and S. D. GEHRT. 2012. Influence of the urban matrix on space use of coyotes in the Chicago metropolitan area. *Journal of Ethology* 30:413-425.

POESSEL, S. A., S. W. BRECK, D. E. BIGGINS, T. M. LIVIERI, K. R. CROOKS and L. ANGELONI. 2011. Landscape features influence postrelease predation on endangered black-footed ferrets. *Journal of Mammalogy* 92:732-741.

SEIDLER, R. G. and E. M. GESE. 2012. Territory fidelity, space use, and survival rates of wild coyotes following surgical sterilization. *Journal of Ethology* 30:345-354.

YOUNG, J. K., K. A. OLSON, R. P. READING, S. AMGALAN-BAATAR and J. BERGER. 2011. Is wildlife going to the dogs? Impacts of feral and free-roaming dogs on wildlife populations. *BioScience* 61:125-132.

Major Research Accomplishments:

- WS predation studies indicated that year-round calving, especially in areas with high predator densities, is subject to higher losses primarily because calves are exposed to mortality agents for longer periods of time rather than having higher natural rates of mortality.
- WS studies showed snowmobile use and subsequent snow compaction in areas may inadvertently allow for increased competition between lynx and coyotes by facilitating coyote access to winter lynx habitats.
- WS research observed that the survival of reintroduced endangered black-footed ferrets decreased when the animals were exposed to areas near likely great-horned owl perches. However, landscape features potentially associated with coyote movements had no appreciable effect on survival.
- WS research showed rub stations for coyotes and wolves provide an inexpensive way to gather hair and subsequent DNA samples for use in monitoring populations, estimating abundance, and exploring genetic diversity.
- WS study showed territory fidelity, space use, and survival rates of surgically sterilized coyote packs were similar to intact coyote packs. Because surgical sterilization of coyotes does not affect territory fidelity, survival rates, or home range maintenance, it may serve as an effective tool to reduce conflict over long time periods. Previous WS research has shown that surgically sterilized coyotes had significantly lower depredation rates of sheep compared to intact coyotes.