



United States Department of Agriculture

Animal and Plant Health Inspection Service

Wildlife Services

FY 2004

Ecology, Behavior, and Management Methods for Predators to Protect Livestock and Wildlife

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National Wildlife Research Center Scientists Study Predation Behavior and Ecology

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research facility devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and acceptable methods, tools, and techniques. NWRC's field station in Logan, UT, is the leading coyote ecology research complex in the world.

Data on predator population dynamics, ecology, and behavior are necessary to understand predation patterns on livestock, game species, and threatened and endangered species. 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. This project is adopting a multi-disciplinary approach to study interactions among predators, and the impact of predators and predator removal on ecosystems and wildlife population dynamics. Results from these studies are fundamental to selective predator management. The information gathered will also be used to guide WS' operational programs, and to provide necessary information in the National Environmental Policy Act (NEPA) process.

Major Research Accomplishments:

- WS demonstrated that coyotes can exert significant negative impacts on smaller predators (swift fox, kit fox) and may decimate populations under appropriate conditions.
- WS provided additional evidence that territorial coyotes are primarily responsible for livestock predation although predation by non-territorial coyotes can be significant when prey is abundant and unprotected.
- WS showed that when coyotes are prevented from having pups, damage to livestock is reduced.



Applying Science and Expertise to Wildlife Challenges

Predator-Prey Relationships—Through field studies, knowledge of the interactions between predators and prey (livestock, native prey, or other predators) will aid in regulatory compliance for Wildlife Services, particularly with regard to NEPA and Endangered Species Act regulations. At the Utah Field Station, studies being initiated include determining the population ecology and evaluating survey methods for swift foxes; examining interactions between coyotes and kit foxes; investigating swift foxes as an indicator species of ecosystem health; determining interactions among wolves, coyotes, and mule deer and their influence the abundances of these species; examining the interactions between wolves, coyotes, and pronghorn; and investigating the predation patterns of jaguars on livestock and native prey species.

Sterilization as a method to prevent predation behaviors—

Using sterilization of coyotes to reduce predation rates on domestic lambs was experimentally tested during 1997-1999. Results of the research found that depredation rates were 6-8 times higher for coyote packs with pups compared to sterilized packs that did not have pups. Provisioning of pups appears to be a major motiva-

tion for adult coyotes to kill domestic lambs. While this research illustrated the utility of sterilization, NWRC researchers will now work directly with livestock producers and WS Operations to determine if implementing predator sterilization programs is practical for reducing losses of livestock by wolves or coyotes.

Groups Affected by This Problem:

- Livestock producers
- Wildlife managers
- Environmental organizations
- Land management agencies
- Pet owners

Major Cooperators:

- Utah State University
- The Berryman Institute
- U.S. Army

Selected Publications:

- Gese, E. M. 2004. Survey and census techniques for canids. Pages 273-279 in Sillero-Zubiri, C.; Hoffmann, M.; Macdonald, D. W. Canids: Foxes, Wolves, Jackals, and Dogs: Status Survey and Conservation Action Plan, 2nd edition. IUCN-The World Conservation Union, Gland, Switzerland.
- Blejwas, K. M.; Sacks, B. N.; Jaeger, M. M; McCullough, D. R. 2002. The
 effectiveness of selective removal of breeding coyotes in reducing sheep
 predation. Journal of Wildlife Management 66(2):451-462.
- Schauster, E. R.; Gese, E. M.; Kitchen, A. M. 2002. Population ecology of swift foxes (Vulpes velox) in southeastern Colorado. Canadian Journal of Zoology 80:307-319.
- Gese, E. M. 2001. Territorial defense by coyotes (Canis latrans): who, what, where, when, and why? Canadian Journal of Zoology. 79:980-987.
- Gese, E. M. 2001. Monitoring of terrestrial carnivore populations. Pages 372-396 in Gittleman, J. L.; Funk, S.M.; Macdonald, D. W.; Wayne, R. K. Carnivore Conservation. Cambridge University Press, London.
- Gese, E. M.; Knowlton, F. F. 2001. The role of predation in wildlife population dynamics. Pages 7-25 in Ginnett, T. T.; Henke, S. E. The Role of Predator Control as a Tool in Game Management. Texas Agricultural Research and Extension Center, San Angelo, TX.
- Stoddart, L. C.; Griffiths, R. E.; Knowlton, F. F. 2001. Coyote responses to changing jackrabbit abundance affect sheep predation. Journal of Range Management. 54:15-2.