



## INDISCRIMINATE KILLING OF COYOTES DOESN'T WORK

### **Killing coyotes harms sensitive ecosystems.**

Coyotes are an integral part of healthy ecosystems, providing a number of free, natural ecological services. For example, coyotes help to control disease transmission, keep rodent populations in check, clean up carrion (animal carcasses), increase biodiversity, remove sick animals from the gene pool, and protect crops. Coyotes balance their ecosystems and have trophic cascade effects such as indirectly protecting ground-nesting birds from smaller carnivores and increasing the biological diversity of plant and wildlife communities.<sup>1</sup>

### **Indiscriminate killing of coyotes will not help control their populations.**

The evidence is clear: over 100 years of coyote exploitation has not reduced their populations. In fact, since 1850 when mass killings of coyotes began, coyotes' range has tripled in the United States.<sup>2</sup> As the University of Illinois points out, "...coyote population reduction (removing some or all of the coyotes in an area) is usually unrealistic and always temporary."<sup>3</sup>

- **Indiscriminate killing of coyotes can stimulate increases in their populations.** Persecution of coyotes disrupts their social structure, which, ironically, encourages more breeding and migration, and ultimately results in more coyotes.<sup>4</sup>
  - The alpha pair in a pack of coyotes is normally the only one that reproduces. When one or both members of the alpha pair are killed, other pairs will form and reproduce. At the same time, lone coyotes will move in to mate, young coyotes will start having offspring sooner, and litter sizes will grow.<sup>5</sup>

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<sup>1</sup> S. E. Henke and F. C. Bryant, "Effects of Coyote Removal on the Faunal Community in Western Texas," *Journal of Wildlife Management* 63, no. 4 (1999); K. R. Crooks and M. E. Soule, "Mesopredator Release and Avifaunal Extinctions in a Fragmented System," *Nature* 400, no. 6744 (1999); E. T. Mezquida, S. J. Slater, and C. W. Benkman, "Sage-Grouse and Indirect Interactions: Potential Implications of Coyote Control on Sage-Grouse Populations," *Condor* 108, no. 4 (2006); N. M. Waser et al., "Coyotes, Deer, and Wildflowers: Diverse Evidence Points to a Trophic Cascade," *Naturwissenschaften* 101, no. 5 (2014).

<sup>2</sup> Robert Crabtree and Jennifer Sheldon, "Coyotes and Canid Coexistence in Yellowstone," in *Carnivores in Ecosystems: The Yellowstone Experience*, ed. T. Clark et al. (New Haven [Conn.]: Yale University Press, 1999)

<sup>3</sup> University of Illinois Extension. *Living with Wildlife in Illinois: Coyote*. University of Illinois at Urbana-Champaign, [http://web.extension.illinois.edu/wildlife/directory\\_show.cfm?species=coyote](http://web.extension.illinois.edu/wildlife/directory_show.cfm?species=coyote).

<sup>4</sup> F. F. Knowlton, E. M. Gese, and M. M. Jaeger, "Coyote Depredation Control: An Interface between Biology and Management," *Journal of Range Management* 52, no. 5 (1999); Robert Crabtree and Jennifer Sheldon, "Coyotes and Canid Coexistence in Yellowstone," in *Carnivores in Ecosystems: The Yellowstone Experience*, ed. T. Clark et al. (New Haven [Conn.]: Yale University Press, 1999); J. M. Goodrich and S. W. Buskirk, "Control of Abundant Native Vertebrates for Conservation of Endangered Species," *Conservation Biology* 9, no. 6 (1995).

<sup>5</sup> Knowlton, F.F. 1972. Preliminary interpretations of coyote population mechanics with some management implications. *J. Wildl. Manage.* 36:369-382.

- While widespread killing may temporarily reduce coyote numbers, coyotes bounce back quickly, even when up to 70 percent of their numbers are removed.<sup>6</sup>
- **It's impossible to completely eradicate coyotes from an area.**<sup>7</sup> New coyotes will quickly replace coyotes removed from an area. Coyote pairs hold territories, which leaves single coyotes ("floaters") continually looking for new places to call home.<sup>8</sup>

## Indiscriminate killing of coyotes will not reduce conflicts with humans, pets, or livestock or increase populations of game animals.

- **Disrupting the coyote family structure may actually increase conflicts.** Exploited coyote populations tend to have younger, less experienced coyotes, increased numbers of yearlings reproducing, and larger litters. Feeding pups is a significant motivation for coyotes to switch from killing small and medium-sized prey to killing sheep.<sup>9</sup>
- **Open hunts do not target specific, problem-causing coyotes.** Most killing contests target coyotes in woodlands and grasslands who are keeping to themselves—not coyotes who have become habituated to human food sources such as unsecured garbage, pet food, or livestock carcasses (left by problem humans).
- **Prevention—not lethal control—is the best method for minimizing conflicts with coyotes.** Eliminating access to easy food sources, such as bird seed and garbage, supervising pets while outside, and keeping cats indoors reduces conflicts with pets and humans. Practicing good animal husbandry and using strategic nonlethal predator control methods to protect livestock (such as electric fences, guard animals, and removing dead livestock) are more effective.<sup>10</sup>
- **Indiscriminate killing of coyotes does not increase game populations.**
  - The best available science demonstrates that killing native carnivores to increase ungulate populations, such as deer, is unlikely to produce positive results because the key to ungulate survival is protecting breeding females and access to adequate nutrition, not predation.<sup>11</sup>

<sup>6</sup> Connolly, G.E. 1978. Predator control and coyote populations: a review of simulation models. Pages 327-345 in M. Bekoff, ed. *Coyotes: biology, behavior, and management*. Academic Press, New York, N.Y.

<sup>7</sup> Washington Department of Fish and Wildlife, *Living with Wildlife*, <http://wdfw.wa.gov/living/coyotes.html>.

<sup>8</sup> Gehrt, S.D. 2004. Chicago coyotes part II. *Wildl. Control. Technol.* 11(4):20-21, 38-9, 42.

<sup>9</sup> F. F. Knowlton, E. M. Gese, and M. M. Jaeger, "Coyote Depredation Control: An Interface between Biology and Management," *Journal of Range Management* 52, no. 5 (1999); B. R. Mitchell, M. M. Jaeger, and R. H. Barrett, "Coyote Depredation Management: Current Methods and Research Needs," *Wildlife Society Bulletin* 32, no. 4 (2004).

<sup>10</sup> Adrian Treves et al., "Forecasting Environmental Hazards and the Application of Risk Maps to Predator Attacks on Livestock," *BioScience* 61, no. 6 (2011); Philip J. Baker et al., "Terrestrial Carnivores and Human Food Production: Impact and Management," *Mammal Review* 38, (2008); A. Treves and K. U. Karanth, "Human-Carnivore Conflict and Perspectives on Carnivore Management Worldwide," *Conservation Biology* 17, no. 6 (2003); J. A. Shivik, A. Treves, and P. Callahan, "Nonlethal Techniques for Managing Predation: Primary and Secondary Repellents," *Conservation Biology* 17, no. 6 (2003); N. J. Lance et al., "Biological, Technical, and Social Aspects of Applying Electrified Fladry for Livestock Protection from Wolves (*Canis Lupus*)," *Wildlife Research* 37, no. 8 (2010); Andrea Morehouse and Mark Boyce, "From Venison to Beef: Seasonal Changes in Wolf Diet Composition in a Livestock Grazing Environment," *Frontiers in Ecology and the Environment* 9, no. 8 (2011).

<sup>11</sup> Bishop, C. J., G. C. White, D. J. Freddy, B. E. Watkins, and T. R. Stephenson. 2009. Effect of Enhanced Nutrition on Mule Deer Population Rate of Change. *Wildlife Monographs*:1-28; Hurley, M. A., J. W. Unsworth, P. Zager, M. Hebblewhite, E. O.

- Comprehensive studies, including those conducted in Colorado<sup>12</sup> and Idaho,<sup>13</sup> show that killing native carnivores fails to grow deer herds. In recent studies that involved predator removal, those removals had no beneficial effect for mule deer.<sup>14</sup>
- In response to hunters' concerns that coyotes are diminishing populations of game animals, the Pennsylvania Game Commission made the following statements in 2016 (see the full letter [here](#)):<sup>15</sup>
  - “During the late 1800s and early 1900s, the Game Commission focused much of its energy and resources into predator control efforts. During this period, we did not understand the relationship between predators and prey. After decades of using predator control (such as paying bounties) with no effect, and the emergency of wildlife management as a science, the agency finally accepted the reality that predator control does not work.”
  - “[Predators] don’t compete with our hunters for game. The limiting factor is habitat—we must focus our efforts on habitat.”
  - The Commission called it a “false prophecy” to “pretend that predator control can return small game hunting to the state[.]” Further, it stated that the focus must be based on “...science, not anecdotal comments stemming from theory or supposition.”
- In recommending against a year-round hunting season on coyotes, the New York State Department of Environmental Conservation based their decision in part on the fact that “...random removal of coyotes resulting from a year-round hunting season will not: (a) control or reduce coyote populations; (b) reduce or eliminate predation on livestock; or (c) result in an increase in deer densities.”<sup>16</sup>

### **Proponents of indiscriminate killing of coyotes (such as in killing contests) exaggerate claims that coyotes attack humans, threaten livestock, and diminish game populations.**

Such incidents are blown out of proportion to make coyotes a convenient scapegoat to justify killing them in large numbers.

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Garton, D. M. Montgomery, J. R. Skalski, and C. L. Maycock. 2011. Demographic Response of Mule Deer to Experimental Reduction of Coyotes and Mountain Lions in Southeastern Idaho. *Wildlife Monographs*:1-33.; Forrester, T. D. and H. U. Wittmer. 2013. A review of the population dynamics of mule deer and black-tailed deer *Odocoileus hemionus* in North America. *Mammal Review* 43:292-308.; Monteith, K. L., V. C. Bleich, T. R. Stephenson, B. M. Pierce, M. M. Conner, J. G. Kie, and R. T. Bowyer. 2014. Life-history characteristics of mule deer: Effects of nutrition in a variable environment. *Wildlife Monographs* 186:1-62.

<sup>12</sup> Bishop, C. J., G. C. White, D. J. Freddy, B. E. Watkins, and T. R. Stephenson. 2009. Effect of Enhanced Nutrition on Mule Deer Population Rate of Change. *Wildlife Monographs*:1-28.

<sup>13</sup> Hurley, M. A., J. W. Unsworth, P. Zager, M. Hebblewhite, E. O. Garton, D. M. Montgomery, J. R. Skalski, and C. L. Maycock. 2011. Demographic Response of Mule Deer to Experimental Reduction of Coyotes and Mountain Lions in Southeastern Idaho. *Wildlife Monographs*:1-33.

<sup>14</sup> Forrester, T. D. and H. U. Wittmer. 2013. A review of the population dynamics of mule deer and black-tailed deer *Odocoileus hemionus* in North America. *Mammal Review* 43:292-308

<sup>15</sup> Frye, Bob. (July 25, 2016). *Habitat, not predators, seen as key to wildlife populations*, Trib Live, <http://triblive.com/sports/outdoors/10756490-74/game-predator-predators>.

<sup>16</sup> NYS Department of Environmental Conservation. (June 1991). *The Status and Impact of Eastern Coyotes in Northern New York*, [http://www.dec.ny.gov/docs/wildlife\\_pdf/coystatnny91.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/coystatnny91.pdf).

- **Humans:** Coyote attacks on humans are exceedingly rare. There has not been a reported coyote attack on humans in Illinois in the last 30 years.<sup>17</sup> The New York Department of Environmental Conservation points out that there are only a handful of coyote attacks on humans annually nationwide, while around 650 people are hospitalized and one person is killed by domestic dogs ever year in New York State alone.<sup>18</sup>
- **Livestock:** According to USDA data, livestock losses to native carnivores are minuscule. In 2010, U.S. cattle and sheep inventories numbered 99.6 million animals. Of that total, 467,100 cattle and sheep were lost to all carnivores combined (including coyotes, domestic dogs, wolves, cougars, bobcats, vultures, and bears), or 0.5 percent of the inventory. The largest source of mortality to livestock, by far, is from disease, illness, birthing problems, and weather.<sup>19</sup>
- **Game Animals:**
  - Coyotes have a diverse diet, but their favorite prey are rabbits and rodents.<sup>20</sup>
  - The Pennsylvania Game Commission recently stated that “practices such as forestry and farming dictate the abundance of small game, not predators.”<sup>21</sup>
  - In a study in Idaho, coyotes and mountain lions were heavily hunted to determine if mule deer numbers would rebound. They did not. The study’s authors found that deer are more limited by a lack of nutrition than by their predators.<sup>22</sup> Many other studies concur with this finding.<sup>23</sup>
  - A study by the New York State Department of Environmental Conservation found that on the whole, data indicated that deer numbers were growing in the presence of well-established coyote populations. Further, it found that it is “...only when other factors, such as poor habitat, harsh winters, and other forms of predation are severe and chronic that coyote predation limits the growth of a deer population...” on a localized basis.<sup>24</sup>

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<sup>17</sup> University of Illinois Extension | University of Illinois at Urbana-Champaign:  
[http://web.extension.illinois.edu/wildlife/directory\\_show.cfm?species=coyote](http://web.extension.illinois.edu/wildlife/directory_show.cfm?species=coyote); see also Illinois DNR:  
<https://www.dnr.illinois.gov/conservation/wildlife/Pages/Coyote.aspx>

<sup>18</sup> NY DEC: <http://www.dec.ny.gov/animals/6971.html>

<sup>19</sup> For an in depth discussion, see: Wendy Keefover, "Northern Rocky Mountain Wolves: A Public Policy Process Failure: How Two Special Interest Groups Hijacked Wolf Conservation in America," *WildEarth Guardians* [www.wildearthguardians.org/site/DocServer/Wolf\\_Report\\_20120503.pdf](http://www.wildearthguardians.org/site/DocServer/Wolf_Report_20120503.pdf) 1, no. 1 (2012).

<sup>20</sup> A. M. Kitchen, E. M. Gese, and E. R. Schauster, "Resource Partitioning between Coyotes and Swift Foxes: Space, Time, and Diet," *Canadian Journal of Zoology-Revue Canadienne De Zoologie* 77, no. 10 (1999).

<sup>21</sup> Frye, Bob. (July 25, 2016). Habitat, not predators, seen as key to wildlife populations, Trib Live, <http://triblive.com/sports/outdoors/10756490-74/game-predator-predators>.

<sup>22</sup> M. A. Hurley et al., "Demographic Response of Mule Deer to Experimental Reduction of Coyotes and Mountain Lions in Southeastern Idaho," *Wildlife Monographs*, no. 178 (2011).

<sup>23</sup> Raymond Lee et al., "Pronghorn Management Guide, Proc. 1998-18th Biennial Pronghorn Antelope Workshop," Pronghorn Antelope Workshop, AZ Game and Fish, and Arizona Antelope Foundation, Inc., (1998); K. L. Monteith et al., "Life-History Characteristics of Mule Deer: Effects of Nutrition in a Variable Environment," *Wildlife Monographs* 186, no. 1 (2014); Bruce Watkins, James Olterman, and Thomas Pojar, "Mule Deer Survival Studies on the Uncompahgre Plateau, Colorado 1997-2001," *Colorado Division of Wildlife*, (2002); T. M. Pojar and D. C. Bowden, "Neonatal Mule Deer Fawn Survival in West-Central Colorado," *Journal of Wildlife Management* 68, no. 3 (2004); C. J. Bishop et al., "Effect of Enhanced Nutrition on Mule Deer Population Rate of Change," *Wildlife Monographs*, no. 172 (2009); T. D. Forrester and H. U. Wittmer, "A Review of the Population Dynamics of Mule Deer and Black-Tailed Deer *Odocoileus Hemionus* in North America," *Mammal Review* 43, no. 4 (2013).

<sup>24</sup> NYS Department of Environmental Conservation. (June 1991). *The Status and Impact of Eastern Coyotes in Northern New York*, [http://www.dec.ny.gov/docs/wildlife\\_pdf/coystatnny91.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/coystatnny91.pdf).