

COYOTE CONTROL IN THE UNITED STATES: ONE STEP FORWARD AND TWO STEPS BACK IN NUISANCE ABATEMENT

ABSTRACT

Coyotes have been the targets of contempt since westward-bound pioneers began spotting them in the nineteenth century. As part of the “taming” of the Wild West, coyotes and all other predators were hunted, trapped, and poisoned to make way for domestic livestock. While the larger canine—the wolf—was brought to near extinction by these predator-control efforts in the early twentieth century, the coyote remained a persistent resident of the landscape.

Individuals, state governments, and the federal government have all tried to eradicate coyotes using a variety of policies and technologies. All of these efforts have largely failed, and the coyote population is now more widespread and abundant than ever. Modern science shows why these policies failed and why they were never good practice in the first place. This Note examines the ecologic impacts of the coyote and the history of their treatment in the United States. With a better understanding of coyotes’ role in our ecosystems and their current status as pests in most states, this Note argues that wildlife policies should be reformed to reflect the ecological reality while still preserving the sport of coyote hunting for future generations to enjoy.

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I. INTRODUCTION

Coyotes have existed in North America for more than a million years.¹ During this time, they did what coyotes do: prey upon smaller mammals, scavenge meals from carcasses, feed on nearby berries and vegetation, and avoid their genetic relative, the wolf.² The coyote’s traits of adaptability, cunning, and persistence became the focus of Native American legends and folklore.³ It is these same traits that make coyotes the target of contempt in modern U.S. society.⁴ As Americans began colonizing the Wild West, they encountered a familiar predator in the wolf—a common predator in Europe.⁵ However, there was no real comparable species in Europe to the American coyote.⁶ But some things were for

1. Simon Worrall, *How the Most Hated Animal in America Outwitted Us All*, NAT’L GEOGRAPHIC (Aug. 7, 2016), <https://news.nationalgeographic.com/2016/08/coyote-america-dan-flores-history-science/> [https://perma.cc/R7CK-9WLX].

2. *See 6 Cool Things You Should Know About Coyotes*, IOWA DEP’T NAT. RES. (Nov. 4, 2015), <http://www.iowadnr.gov/About-DNR/DNR-News-Releases/ArticleID/189/6-Cool-Things-You-Should-Know-About-Coyotes> [https://perma.cc/7EUK-KAFH].

3. DAN FLORES, *COYOTE AMERICA: A NATURAL AND SUPERNATURAL HISTORY* 6, 10 (2016).

4. Worrall, *supra* note 1.

5. Jay Antle, *Against Kansas’s Top Dog: Coyotes, Politics and Ecology, 1877-1970*, 20 KAN. HIST. 160, 163 (1977); Patrick Barkham, *Harmless or Vicious Hunter? The Uneasy Return of Europe’s Wolves*, GUARDIAN (Jan. 26, 2018), <https://www.theguardian.com/environment/2018/jan/26/harmless-or-vicious-hunter-the-uneasy-return-of-europes-wolves> [https://perma.cc/KV4K-WX7F].

6. Worrall, *supra* note 1.

sure: coyotes looked like wolves, sounded like wolves, and ate like wolves.⁷ As such, they were a nuisance and a threat that needed to be disposed of.⁸ Coyotes, along with wolves, were killed whenever possible to protect livestock herds and caravan supplies.⁹

What these original colonizers lacked was the knowledge that predators play a vital role in stabilizing the food chain.¹⁰ Modern science now shows the indiscriminate and continuous killing of predators harms overall biodiversity and leads to an imbalance in the wildlife food chain.¹¹ The result is an overpopulation of rodents, large ungulates (such as deer, elk, and antelope), and other herbivores.¹² These species feed largely on plants, resulting in significant crop loss to farmers.¹³ This is of particular concern to Iowa farmers as tariffs push profit margins ever tighter.¹⁴

This Note argues Iowa's coyote-hunting regulations are outdated and not consistent with modern ecological science. Iowa should make practical reforms to these regulations to reflect the fact that coyotes aid in controlling the rodent and deer populations to the benefit of the citizens of Iowa. Part II details the role that coyotes and other predators play in ecosystems, both historically and in modern times. Part III examines past attempts at controlling coyote populations and impacts—noting the consistent failure at every level of government. Ultimately, these failures are due to the highly adaptable nature of the coyote. Part IV describes the current coyote-control scheme in Iowa and evaluates its utility. Part V provides reform options that could better address coyote-control efforts while preserving coyote hunting in a more sportsmanlike and ethical way. The final Part concludes

7. See Antle, *supra* note 5, at 163–64.

8. See *id.*

9. See *id.*; Worrall, *supra* note 1.

10. Caroline Fraser, *The Crucial Role of Predators: A New Perspective on Ecology*, YALE ENV'T 360 (Sept. 15, 2011), https://e360.yale.edu/features/the_crucial_role_of_predators_a_new_perspective_on_ecology [<https://perma.cc/3QSH-3HDC>].

11. *Id.*

12. *Id.*

13. See Gary Witmer & Grant Single, *Sustained Agriculture: The Need to Manage Rodent Damage*, in AGRICULTURAL PRODUCTION 1, 5–6 (Felix C. Wager ed., 2011); see also Friedrich Reimoser & Rory Putman, *Impacts of Wild Ungulates on Vegetation*, in UNGULATE MANAGEMENT IN EUROPE—PROBLEMS AND PRACTICES 144, 147 (Rory Putman, Marco Apollonio & Reidar Anderson eds., 2011) (noting ungulates cause serious damage to both agriculture and forestry).

14. Donnelle Eller, *Iowa Farmers' Angst Grows as Tariffs Mount. But Many Still Back Trump and His Allies . . . for Now*, DES MOINES REG. (July 20, 2018), <https://www.desmoinesregister.com/story/money/agriculture/2018/07/20/iowa-politicians-court-farmers-trump-tariffs-sow-fear-ag-country/782196002/> [<https://perma.cc/6C9H-E4C9>].

this Note.

II. COYOTES' IMPACT ON ECOSYSTEMS

Coyotes and their canine ancestors have been in North America for over a million years.¹⁵ As a predator, they are naturally near the top of the food chain, although not quite the “king of the jungle” like the lions of Africa.¹⁶ A coyote’s diet consists of small mammals, birds, discarded human food and pet food, insects, reptiles, and wild berries.¹⁷ This Part shows that due to changing ecology, coyotes play an even more beneficial role in Iowa and the United States at large.

A. Coyotes' Spot in the Food Chain

As a predator, coyotes are naturally near the top of the food chain.¹⁸ Since the expansion of modern civilization across the lower 48 states, they have achieved an even higher prominence as the dominant predator in many environments.¹⁹ Their canine teeth allow them to hunt many small mammals and ground-dwelling birds.²⁰ Adult coyotes typically weigh between 20 and 50 pounds, making them far from the largest predator on the continent.²¹ However, their ability to hunt in packs allows them to successfully hunt large

ungulates such as deer.²² Coyotes’ predation on all sorts of mammals means they play a vital role in keeping ecosystems balanced, to the benefit of humans.²³

15. *6 Cool Things You Should Know About Coyotes*, *supra* note 2.

16. See Jeff Goertzen, *What Do Coyotes Eat? A Look at the Food Chain*, ORANGE COUNTY REG. (June 7, 2017), <https://www.oregister.com/2017/06/07/what-do-coyotes-eat-a-look-at-the-food-chain/> [<https://perma.cc/M4PP-4AYC>] (“Barring mountain lions, which don’t typically hunt coyotes, coyotes are at the top of the food chain in the Southern California animal kingdom.”).

17. *Id.*

18. *Id.*

19. See Antle, *supra* note 5, at 163–64; see also *6 Cool Things You Should Know About Coyotes*, *supra* note 2 (“Today . . . [coyotes] now act as our most common large predator.”); Goertzen, *supra* note 16.

20. See *Coyotes*, NAT’L PARK SERV. (Nov. 24, 2015), <https://www.nps.gov/bibe/learn/nature/coyote.htm> [<https://perma.cc/PD5B-2G8Y>]; Goertzen, *supra* note 16.

21. See Alina Bradford, *Coyote Facts*, LIVE SCI. (Sept. 25, 2017), <https://www.livescience.com/27976-coyotes.html>; Jesse Males, *North American Predators: Top 5 Animals You Don’t Want to Mess with*, WIDE OPEN SPACES (Dec. 16, 2019), <https://www.wideopenspaces.com/heres-what-you-need-to-know-about-the-top-5-north-american-predators/> [<https://perma.cc/WU3J-2TV4>].

22. *Coyotes 101*, COYOTE SMARTS, <https://www.coyotesmarts.org/coyotes101/> [<https://perma.cc/6YR8-G7EJ>].

23. See Fraser, *supra* note 10.

Coyotes did not always occupy such a prominent role among U.S. predators. Before the Wild West was tamed, wolves were much more abundant.²⁴ As a sort of larger version of the coyote, wolves helped keep herbivore and rodent populations in check.²⁵ That is until the pioneers began expanding westward, shooting, trapping, and poisoning anything that resembled a wolf in order to make the land more fit for raising livestock.²⁶ Wolves were systematically killed for years, pushing many subspecies to near extinction.²⁷ For example, only recent reintroduction programs have allowed the Mexican gray wolf to establish a foothold back in its historic territories in Arizona and New Mexico.²⁸

In the absence of its larger genetic relative, coyotes were able to expand their territory.²⁹ Along with the new territory came new sources of food, and “coyotes are not picky eaters.”³⁰ The increase in food availability prompted higher reproduction rates among coyotes, thereby effectively filling the void left by the now much rarer wolves.³¹

B. Diet and Hunting Habits

1. Coyotes as Rodent-Population Managers

The importance of the coyote in controlling rodent populations cannot be overstated. Rodents are some of the most destructive animals from an economic standpoint:³² “Every year, rats in Asia consume food crops that could feed 200 million people for an entire year.”³³ In the United States, rodents can get into grain storage bins, causing significant losses due to contamination, or, alternatively, simply eat the crops right off the field.³⁴ Small mammals such as rodents make up

24. Antle, *supra* note 5, at 163–64.

25. *See id.*

26. *See id.*

27. *See id.*

28. Alex Devoid, *Endangered Mexican Gray Wolf Population Remained Flat in New Count*, AZCENTRAL (Feb. 22, 2018), <https://www.azcentral.com/story/news/local/arizona-environment/2018/02/22/endangered-mexican-gray-wolf-population-remained-flat-arizona-new-mexico/360862002/> [<https://perma.cc/5UCB-KXLC>].

29. *See* Antle, *supra* note 5, at 163–64.

30. Bradford, *supra* note 21.

31. Antle, *supra* note 5, at 163–64.

32. *The Economic Ill-Effects of Rodent Infestation*, VICTOR PEST, <http://www.victorpest.com/articles/economic-effects-of-rodent-infestation> [<https://perma.cc/5696-C4VG>].

33. Nils Chr. Stenseth et al., *Mice, Rats, and People: The Bio-Economics of Agricultural Rodent Pests*, 1 FRONTIERS ECOLOGY & ENV'T 367, 367 (2003).

34. Witmer & Single, *supra* note 13, at 5–6.

a significant portion of the typical coyote's diet.³⁵ Coyotes that are not part of a pack, and thus not able to hunt larger animals such as deer, are particularly fond of hunting small mammals.³⁶

Coyotes are such effective rodent hunters that the city of Chicago has released coyotes fitted with GPS collars into the city streets in an effort to reduce rodent populations.³⁷ Kansans have experience with the coyote's effectiveness at rodent control as well, although they learned this lesson the hard way: "One rancher's wife recalled in a letter 'the story of farmers who decided to have a 100 percent kill of coyotes one year. They did. The next year, the rodents took the crops.'"³⁸ Another anecdote published by the *Salt Lake Weekly Tribune* in 1887 reported a group of farmers had "exterminated [coyotes] by poison," causing the rabbits to multiply into "swarms, so . . . the farmers pray for coyotes now."³⁹ But not only do coyotes mitigate economic damage from crop-killing rodents, they also protect vegetative biodiversity by acting as a deer-population manager.⁴⁰

2. Coyotes as Deer-Population Managers

Deer are herbivores, feeding on green plants, twigs, acorns, and corn.⁴¹ Iowa farmers have been complaining about crop damage from deer since the 1870s.⁴² These complaints are not baseless. One study in Indiana found white-tailed deer accounted for 61 percent of documented soybean damage.⁴³ In a 1914 case—before there was a deer-hunting season in the state—the Iowa Supreme Court overturned the conviction of an irate farmer who shot and killed a deer that was causing damage to his crops, showing deer have long been a drain on agricultural

35. See Bradford, *supra* note 21.

36. See *General Information About Coyotes*, URBAN COYOTE RES. PROJECT, <https://urbancoyotereseach.com/coyote-info/general-information-about-coyotes> [https://perma.cc/YM7C-K796].

37. Jaymi Heimbuch, *Chicago Using GPS-Collared Coyotes to Control Rodents?*, TREEHUGGER (Nov. 16, 2010), <https://www.treehugger.com/natural-sciences/chicago-using-gps-collared-coyotes-to-control-rodents.html> [https://perma.cc/E2WG-NLE5].

38. Antle, *supra* note 5, at 174.

39. FLORES, *supra* note 3, at 83.

40. See JOHN LOOMIS, FUZZY MATH: WILDLIFE SERVICES SHOULD IMPROVE ITS ECONOMIC ANALYSIS OF PREDATOR CONTROL 13 (2012), <https://www.nrdc.org/sites/default/files/fuzzy-math-IP.pdf> [https://perma.cc/BJF7-QXPV].

41. *White-Tailed Deer – Odocoileus Virginianus*, NATURE WORKS, <http://www.nhptv.org/natureworks/whitetaileddeer.htm> [https://perma.cc/TN5X-BDN9].

42. LARRY STONE, WHITETAIL: TREASURE, TROPHY, OR TROUBLE? 36 (2003).

43. *Wildlife Crop Depredation*, IOWA ST. U., <https://naturalresources.extension.ia.state.edu/wildlife/wildlife-crop-depredation> [https://perma.cc/Z43Q-TXAS].

production.⁴⁴

Since then, Iowa has instituted a hunting season for deer.⁴⁵ What started as a four-day shotgun season in 1953 has gradually become longer and less regulated as Iowa tries to control the growth of the deer population.⁴⁶ Recently, Iowa enacted a regulation allowing hunters to use rifles firing certain caliber rounds that are more accurate at long range than a shotgun slug—traditionally the only type of firearm allowed besides large-caliber handguns and muzzleloader rifles (think muskets).⁴⁷ Additionally, Iowa allows bow hunters to harvest an extra doe each season provided that the animal is donated to the local food bank.⁴⁸ Despite all of these efforts, Iowa's deer population remains steady at an estimated 500,000 animals.⁴⁹

Farmers are not the only group that deer agitate. Motorists and insurance companies would also like to see a reduction in deer numbers.⁵⁰ In 2012, car accidents involving a collision with deer cost over \$4 billion in vehicle damage alone.⁵¹ Even more striking is the human toll, causing about 175–200 deaths and 10,000 injuries each year.⁵² Reducing the number of deer thus seems beneficial from both an economic and safety standpoint.

Coyotes are some of the best deer-population managers available. In one habitat area, coyotes accounted for at least 37 percent of deer fawn mortalities and as much as 80 percent of deer fawn mortalities when including data of probable

44. *State v. Ward*, 152 N.W. 501, 502–03 (Iowa 1914).

45. STONE, *supra* note 42, at 37.

46. *Id.* at 20–34.

47. William Petroski, *New Rifle Law Could Bring Big Bucks for Iowa Deer Hunting*, DES MOINES REG. (Sept. 21, 2017), <https://www.desmoinesregister.com/story/news/politics/2017/09/21/straight-wall-cartridge-rifle-law-has-iowa-hunters-gun-sellers-happy/687078001/> [<https://perma.cc/X89E-ET4K>].

48. HUSH, FOOD BANK IOWA, <https://www.foodbankiowa.org/make-a-difference/donate-food/hush> [<https://perma.cc/64TE-SMMN>].

49. *Iowa Deer Population*, DEER FRIENDLY, <http://www.deerfriendly.com/deer/iowa> [<https://perma.cc/M6EJ-6YM7>].

50. See Anne Broache, *Oh Deer!*, SMITHSONIAN MAG. (Oct. 2005), <https://www.smithsonianmag.com/science-nature/oh-deer-70659694/> [<https://perma.cc/5VZE-X9NK>] (“Nationwide, cars hit at least 1.5 million deer a year, the Insurance Institute for Highway Safety reports, causing more than a billion dollars in vehicle damage. In 2003, collisions with animals killed 210 people, and three-quarters of the encounters involved deer.”).

51. *Car and Deer Collisions Cause 200 Deaths, Cost \$4 Billion a Year*, INS. J. (Oct. 24, 2012), <https://www.insurancejournal.com/news/national/2012/10/24/267786.htm> [<https://perma.cc/TGF5-H8B5>].

52. *Deer vs. Car Collisions*, WEST BEND, <https://cultureofsafety.thesilverlining.com/driving/deer-vs-car-collisions> [<https://perma.cc/GJV3-3Y33>].

coyote predation.⁵³ Coyotes are much more effective hunters than humans. Wild predators such as coyotes are not restricted from hunting by an established hunting season. Meanwhile, human hunters, at least in Iowa, are limited to a few months of legal deer hunting per year.⁵⁴ Even during that time, most people cannot afford to be in the woods hunting deer all season long instead of working. If the goal is to reduce deer populations in the interests of protecting crops, people, and wallets, coyotes should be viewed not as a nuisance but as a partner in an effective wildlife-management policy.

3. Coyote Predation on Livestock

The aspect of a coyote's hunting habits and diet that is most troublesome is coyote predation on livestock. It was this characteristic of wolves that prompted the systematic eradication of those animals from much of the Midwest.⁵⁵ Coyotes and wolves both were accustomed to hunting large ungulates long before the first ranchers showed up.⁵⁶ After the population of their traditional large prey—bison—was decimated, “[R]anchers quickly filled this [bison’s] niche with domestic animals such as cattle[,] sheep . . . turkeys and chickens.”⁵⁷ Ranchers thus saw wolves and coyotes as a threat that needed to be tamed if the Wild West was ever to “turn a profit.”⁵⁸ However, this assumption was based on insufficient information about the relationship between coyotes and domestic animals.⁵⁹

Even Iowa Department of Natural Resources officials admit coyotes are incorrectly accused of causing livestock losses.⁶⁰ Commonly, the attack was

53. John C. Kilgo et al., *Predation by Coyotes on White-Tailed Deer Neonates in South Carolina*, 76 J. WILDLIFE MGMT. 1420, 1420 (2012).

54. IOWA DEP'T OF NAT. RES., 2018-19 IOWA HUNTING, TRAPPING & MIGRATORY GAME BIRD REGULATIONS (2018), <https://bidopportunities.iowa.gov/Home/GetBidOpportunityDocument/91d03035-815c-49c2-afb2-88c30918ab5f> [<https://perma.cc/W4H2-MU3S>] [hereinafter IOWA HUNTING REGULATIONS].

55. See Antle, *supra* note 5, at 163.

56. See *id.*

57. *Id.*

58. *Id.* (“Predators stood in the way of the domestication of the North American landscape. If the wilderness was to turn a profit and progress to sweep westward, so the argument went, natural obstacles such as wolves, bobcats, and coyotes, much like Indians, had to give way before the American people. Kansas, like the rest of the West, had to be ‘won’ from predators to make it safe for livestock and profitable . . .”).

59. *Id.* at 166.

60. BH News Serv., *Coyote Population Continues to Increase, Especially in Southwest Iowa*, DAILY NONPAREIL (Jan. 17, 2018), <https://www.nonpareilonline.com/news/local/coyote-population-continues-to-increase-especially-in->

actually perpetrated by a lesser known predator—wild dogs.⁶¹ The mix-up in identity is easy to understand, given the vast genetic and biological similarities between coyotes and dogs.⁶² But that is not the only problem in determining whether a coyote killed a domestic animal.

Coyotes will eat just about anything.⁶³ They will happily scavenge the meat of animals that have already been killed and fed on by another predator.⁶⁴ In the 1950s, one scientist studied the contents of coyotes' stomachs in Kansas:⁶⁵ "He found that more than half of [the coyote] diet was rabbit and that 27 percent of coyote food was carrion, which included domestic livestock."⁶⁶ These findings suggest typical coyotes do not normally attack livestock.⁶⁷ He further estimated that by preying on rabbits and rodents that eat vegetation, "[C]oyotes partially 'paid' for their predation on livestock."⁶⁸

The defense of livestock is the largest justification for predator-control programs. The United States Department of Agriculture Wildlife Services Division

southwest-iowa/article_7c0fa580-fb05-11e7-a561-6f91737a3ba0.html [https://perma.cc/BA2P-AQKB] (citing an interview with two Iowa Department of Natural Resources officials).

61. Antle, *supra* note 5, at 168 ("[E]vidence suggests that wild dogs, as much as coyotes, attacked Kansas sheep. . . . Finally, ample evidence suggests that much of the damage to livestock attributed to coyotes actually may have been caused by wild dogs."); BH News Serv., *supra* note 60 ("There is a lot of emotion and polarization with people hating or loving the coyotes and feel they are attacking livestock or calves, but often times it's a small pack of dogs that do that more 'We're not saying the coyote is innocent, but they are often wrongfully accused."); Megan M. Draheim, *Why Killing Coyotes Doesn't Make Livestock Safer*, CONVERSATION (May 29, 2017), <https://theconversation.com/why-killing-coyotes-doesnt-make-livestock-safer-75684> [https://perma.cc/646F-WSBW] ("[E]ven 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.").

62. See Valeda Slade, *Wolves, Coyotes and Dogs*, SCHOLASTIC, <https://www.scholastic.com/teachers/articles/teaching-content/wolves-coyotes-and-dogs/> [https://perma.cc/R748-2276].

63. See *infra* Part II.

64. *Living with Wildlife*, WASH. DEP'T FISH & WILDLIFE, <https://wdfw.wa.gov/living/coyotes.html> [https://perma.cc/VP6R-3SRP]; *What Do Urban Coyotes Eat?*, URBAN COYOTE RES. PROJECT, <https://urbancoyotereseearch.com/faq/what-do-urban-coyotes-eat> [https://perma.cc/23SY-CLT6].

65. Antle, *supra* note 5, at 165–68.

66. *Id.* at 166.

67. *Id.* at 166–68.

68. *Id.* at 166 (indicating that even where coyotes attacked livestock, the financial impact would be only slight).

(Wildlife Services) implements predator-control programs at the federal level.⁶⁹ The details of this program will be explored in Part III. In this Part, this Note will examine how Wildlife Services values these programs and determine if these claims are consistent with what we know about the ecological role and economic impacts of predators. Wildlife Services claims that for every \$1 spent on predator control, \$4.87 of livestock is saved.⁷⁰ Unlike the above study of Kansas coyotes, this result does not include value saved from loss of vegetation thanks to the coyotes' predation of rabbits and rodents.⁷¹ Wildlife Services' economic-impact studies have also been criticized for flawed methodology resulting in overinflated economic-benefit claims.⁷²

In sum, coyotes are not “pure evil” as the majority of the public used to think.⁷³ They aid in mitigating crop damage from invasive rodents; keep deer populations in check to the benefit of farmers, motorists, and insurance companies; and the largest justification for their vilification—defense of livestock—is of questionable credibility. With this understanding of the role that coyotes play in ecosystems generally, this Note will now examine federal and state policies implemented to “control” coyotes.

III. THE CONSISTENT FAILURES OF COYOTE-CONTROL EFFORTS

State and local governments started targeting predators for extermination around 1860, when ranchers and farmers started expanding their operations westward into traditional coyote territory.⁷⁴ Beginning around 1880, after wolves had been sufficiently culled from the West, attention turned to the coyote as a logical progression of predator-control efforts.⁷⁵ However, coyotes proved to be a more resilient adversary than their larger relatives, prompting the federal government to step in during the twentieth century.⁷⁶ Ultimately, even with the might of all levels of government behind them, predator-control programs have

69. *Protecting Livestock from Predators*, U.S. DEP'T AGRIC., https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/operational-activities/sa_livestock/ct_protecting_livestock_predators [<https://perma.cc/5574-4PFB>] (last modified July 23, 2015).

70. *Id.*

71. *Id. Contra* Antle, *supra* note 5, at 168 (noting the study found that coyotes cost each farm around \$12.35 per year but that each coyote saved \$21 of rodent damage per year).

72. *See generally* LOOMIS, *supra* note 40 (detailing how Wildlife Services does not follow federal cost-benefit analysis procedures, overestimates the amount of species benefited by predator control, and does not consider more cost-effective alternatives to predator control).

73. *See* Antle, *supra* note 5, at 168.

74. FLORES, *supra* note 3, at 87.

75. *Id.*

76. *See id.* at 97.

failed to exterminate coyotes.

A. State-Subsidized Coyote Control

States turned their attention to killing coyotes after wolves had mostly been eradicated from the Midwest and West.⁷⁷ Driven mostly by complaints from farmers and the ranching industry, states began offering bounties for coyote pelts.⁷⁸ Most states in the West and Midwest have since abandoned these policies after finding them to be too costly and ineffective at reducing coyote populations.⁷⁹ Some states, particularly those in the Southeast where coyotes are new to the area, are turning to bounties in the hopes of pushing coyotes out.⁸⁰ These newer programs are not motivated by the ranching industry but rather by the idea that coyotes kill preferred game species such as deer and wild turkeys.⁸¹ However, as the experience of the western states show, bounties are ineffective coyote-population controllers.⁸²

1. The Kansas Example

When Americans began expanding civilization westward in the mid-1800s,

77. See, e.g., Antle, *supra* note 5, at 163.

78. *Id.* at 169; FLORES, *supra* note 3, at 88.

79. See, e.g., Antle, *supra* note 5, at 169–70; Adam Burke, *Counties Put a Bounty on Coyotes*, HIGH COUNTRY NEWS (Apr. 26, 1999), <https://www.hcn.org/issues/153/4952> [<https://perma.cc/75HU-SAF6>] (describing the first bounty put on coyotes in Colorado since the policies were abandoned in the 1960s); Mike Stark, *Mange Threatening Wolves*, BILLINGS GAZETTE (Mar. 1, 2007), https://billingsgazette.com/news/state-and-regional/montana/mange-threatening-wolves/article_2e3904bc-89f2-5189-96eb-61f559fe42ba.html [<https://perma.cc/AX4G-HVAE>] (discussing how Montana turned away from a bounty system in favor of a biological-warfare approach after determining the bounty system failed to achieve the desired coyote-control results).

80. See, e.g., Jay Butfiloski, *Coyotes Released for 2018 Coyote Harvest Incentive Program*, S. C. MORNING AGCLIPS (Dec. 27, 2017), <https://www.morningagclips.com/coyotes-released-for-2018-harvest-incentive-program/> [<https://perma.cc/74YV-RZ3G>] (granting hunters who kill and harvest a coyote that was tagged by the Department of Natural Resources a lifetime hunting license in the state); Craig Lucie, *Georgia Coyote Challenge Kicks Off, but Not Without Its Controversy*, WSB-TV (Feb. 28, 2018), <https://www.wsbtv.com/news/local/annual-georgia-coyote-challenge-brings-out-annual-controversy/708748468/> [<https://perma.cc/7K6A-BJAT>] (describing a program allowing hunters to submit dead coyotes for an entry into a drawing for a lifetime hunting license).

81. See Christel Bell, *Hunting Coyotes Could Reward Hunters with Cash*, WMBF NEWS (Feb. 25, 2016), <http://www.wmbfnews.com/story/31319777/hunting-coyotes-could-reward-hunters-with-cash/> [<https://perma.cc/5DMB-QWKE>].

82. Antle, *supra* note 5, at 170; see FLORES, *supra* note 3, at 88 (stating that while bounties produced desired results for wolf-population control, they were ineffective against coyotes and subsequently called into question by the federal government).

Kansas was on the western frontier.⁸³ In 1877, to make way for sheepherders and cattle farmers, Kansas allowed counties to pay a \$1 bounty on the scalps of wolves and coyotes.⁸⁴ After seeing no real decrease in coyote population after eight years, the bounty was increased to \$3 per scalp in 1885.⁸⁵ The result was a strain on the state's finances,⁸⁶ and the bounty was reduced back down to \$1 per hide in 1907.⁸⁷ The bounty paid for coyote scalps continued to fluctuate until 1941, when the amount owed to bounty hunters exceeded the state's allocation by \$10,000, leading Kansas to liquidate all bounty claims at \$0.42 on the dollar.⁸⁸ By the 1960s, the bounty system had all but collapsed under its own financial weight.⁸⁹

Also noteworthy is the method by which bounty hunters killed and collected coyotes. Certainly Kansans used firearms and traps to kill coyotes,⁹⁰ but poisoning the predators was the most convenient way to dispose of them.⁹¹ By the 1850s, a chemical called strychnine was a common product available at western trading posts.⁹² A cheap and effective poison, travelers and hunters used strychnine to lace the carcasses of dead bison and horses to kill any coyote that scavenged a meal from the carcass.⁹³ The availability of this chemical allowed travelers to "lace every dead bison or horse they saw with the poison, hang around a day or two to see what happened, and reap the benefits."⁹⁴ Despite the widespread poisoning and hunting, coyotes were never eradicated from Kansas like their wolf relatives.⁹⁵

2. *The Montana Example*

Montana also used bounties during the same time period as Kansas.⁹⁶ During Montana's time as a territory of the United States, the bounty "devoured a stunning two-thirds of Montana's annual budget."⁹⁷ This program was highly effective at

83. Antle, *supra* note 5, at 163.

84. *Id.* at 169.

85. *Id.*

86. *See id.*

87. *Id.*

88. *Id.* at 170.

89. *Id.*

90. *See id.* at 169 ("Further . . . hunting coyotes was good for the soul as 'it stimulates the boys to hunt for wolves to earn some extra money and affords them good fun and exercise.'").

91. FLORES, *supra* note 3, at 86.

92. *Id.*

93. *Id.*

94. *Id.*

95. *See* Antle, *supra* note 5, at 169–70.

96. FLORES, *supra* note 3, at 88.

97. *Id.*

removing wolves, with Montana paying bounties on only 17 gray wolf pelts in the later years of the program.⁹⁸ However, coyote bounties paid remained steady at around 30,000 per year from 1883 to 1928.⁹⁹ For reasons ecologists could not yet explain, removing coyotes had seemingly no effect on their prevalence.¹⁰⁰

Having noted the traditional coyote killing methods—shooting, trapping, and poisoning—were not diminishing the number of coyotes to a satisfactory level, Montana passed a law in 1905 requiring the state veterinarian to infect wild coyotes with mange.¹⁰¹ Despite this “early form of state-sanctioned biological warfare,” coyote numbers in the state remained steady.¹⁰²

3. *Modern State Coyote Policies*

Apart from those states with bounties currently in place,¹⁰³ most states today are less aggressive in actively pursuing coyotes and leave the bulk of the work to the federal government.¹⁰⁴ However, most states allow individuals to hunt coyotes subject to very few regulations compared to other animals. For example, when hunting any kind of deer (white-tailed, black-tailed, sitka, sika, mule deer, coues deer, etc.), hunters can only hunt during the season established by the state’s fish and game agency, can only hunt with certain weapons, and can only harvest a certain number of animals per season.¹⁰⁵ In contrast, most states allow coyote hunting year round,¹⁰⁶

98. *Id.*

99. *Id.*

100. *See id.* at 88–89.

101. 1905 Mont. Laws 302–03; FLORES, *supra* note 3, at 88. Mange is a disease that causes fur loss. Coyotes rely on their fur to help them survive the winter. The idea behind this policy was that if enough coyotes develop mange from contact with infected individuals, less would survive the winter, resulting in a significant population drop. *See Disease*, URBAN COYOTE RES. PROJECT, <https://urbancoyotersearch.com/coyote-info/disease> [<https://perma.cc/7D9V-MDNX>].

102. FLORES, *supra* note 3, at 88.

103. *See supra* note 80 and accompanying text.

104. *See infra* Part III.B.

105. *See, e.g.*, IOWA ADMIN. CODE r. 571-106.2–571-106.7 (2019); ALA. DEP’T OF CONSERVATION & NAT. RES., ALABAMA REGULATIONS 2018-2019 GAME, FISH, FURBEARERS, AND OTHER WILDLIFE 16 (2018), <https://www.outdooralabama.com/sites/default/files/Enforcement/2018-2019%20REG%20BOOK%20Revised%20Final.pdf> [<https://perma.cc/C64J-J4WN>]; AZ. GAME & FISH DEP’T, 2018-19 ARIZONA HUNTING REGULATIONS 34 (2018), https://s3.amazonaws.com/azgfd-portal-wordpress/azgfd.wp/wp-content/uploads/2018/04/24093438/2018-19-AZ-Hunt-Regulations_WEB.pdf [<https://perma.cc/75BZ-UXKZ>].

106. Randy D. Smith, *Coyote Hunting Regulations in 50 States*, DIGITAL FIELD VIEW (Feb.

with no limit on the number of coyotes a hunter can harvest¹⁰⁷ and no restriction on the types of weapons used.¹⁰⁸

One result of this lack of regulation is coyote-hunting competitions, or coyote derbies, organized by hunters.¹⁰⁹ Thanks to the lack of bag limits, hunters who participate in a coyote derby can win cash prizes based on which team kills the most coyotes.¹¹⁰ Prizes are also commonly awarded for the largest coyote killed, but in some cases hunters are given awards for killing the smallest coyote in the competition.¹¹¹ Presumably, the smallest coyote would also be the youngest.¹¹²

This is in stark contrast to how sport hunters of other animals value their harvest. For example, white-tailed deer hunters have developed a complex system of measuring a male deer's antlers, resulting in a numeric value that can be compared to others.¹¹³ The bigger and more complex the antlers are, the higher the score.¹¹⁴ With a higher score comes stronger bragging rights and the possibility of getting one's name in the record books.¹¹⁵ This scoring system was initially developed as an incentive for harvesting mature deer instead of *every* deer a hunter

2010), <http://digitalcrosshairs.com/coyote-hunting.php> [<https://perma.cc/A5UH-3R5H>]. The only states with any meaningful coyote-hunting "season" are Arkansas, Massachusetts, Michigan, Mississippi, New Jersey, and New York. *See id.*

107. *See, e.g.*, IOWA ADMIN. CODE r. 571-108.5; Chad Clark, *Coyote Hunting Ohio*, (Aug. 7, 2014), <https://www.coyotehunting101.com/coyote-hunting-ohio/> [<https://perma.cc/EXZ8-PEBF>].

108. *See Hunters Turning Attention to the Wily Coyote*, IOWA DEP'T NAT. RES. (Jan. 10, 2017), <https://www.iowadnr.gov/About-DNR/DNR-News-Releases/ArticleID/1124/Hunters-turning-attention-to-the-wily-coyote> [<https://perma.cc/LQ3K-JE79>].

109. *See FLORES, supra* note 3, at 183–85.

110. *Id.* at 183.

111. Jacquelyn Voghel, *State Wildlife Officials Propose Ban on Coyote Killing Contests*, DAILY HAMPSHIRE GAZETTE (July 18, 2019) <https://www.gazettenet.com/Coyotes-hg-071919-27089634> [<https://perma.cc/GY36-QF75>] [hereinafter *Proposed Coyote Killing Contest Ban*].

112. *See id.*

113. *See Official Scoring Calculator*, BOONE & CROCKETT CLUB, https://www.boone-crockett.org/scoring/bc_scoring_typwhitetail.asp [<https://perma.cc/99CK-NFSD>].

114. *See How to Score a Buck*, SUMMIT TREESTANDS (Sept. 17, 2018), <https://www.summitstands.com/summit-journal/how-to-rough-score-deer/> [<https://perma.cc/H5Q9-4A3L>].

115. *See id.*

sees.¹¹⁶

Coyote derbies, on the other hand, incentivize killing every single coyote possible, regardless of qualities such as age or thickness of fur.¹¹⁷ In some cases, as many as 200 coyotes have been killed in a single, weekend-long derby.¹¹⁸ Some states, such as Iowa, prevent a hunter from leaving any usable part of a harvested animal in the field.¹¹⁹ This is not the case in every state, and sometimes the carcasses are simply left in the field to rot after a derby ends.¹²⁰ Most hunters are ethical people who treat the animals they harvest with the utmost respect,¹²¹ but the lack of state coyote-hunting regulations allows what some would consider disrespectful behavior to occur in the name of predator control—even in the face of science that shows indiscriminately killing coyotes does not protect livestock or big game animals.¹²²

B. *The Federal Government's Losing Fight Against Coyotes*

1. *The Beginning of Federal Coyote-Control Efforts*

With states such as Kansas and Montana seemingly at a loss for how to control coyote populations, the federal government began funding the killing of “wolves, prairie dogs, and other animals injurious to agriculture and animal husbandry.”¹²³ The Bureau of Biological Survey (now called Wildlife Services) subsequently began a campaign of poisoning predators en masse.¹²⁴ The Bureau’s methods paralleled that of the states but on a larger scale. The Bureau opened a poison-manufacturing plant in Denver, Colorado, specifically for its use in killing

116. *Id.* (emphasis added).

117. *Proposed Coyote Killing Contest Ban*, *supra* note 111.

118. FLORES, *supra* note 3, at 184.

119. IOWA HUNTING REGULATIONS, *supra* note 54, at 13.

120. *See* FLORES, *supra* note 3, at 185.

121. *See, e.g.*, Jeff Barnard, *Just Because You Can Doesn't Mean You Should: Hunting Ethics*, MEDIUM (Oct. 21 2016), <https://medium.com/@MyODFW/just-because-you-cant-mean-you-should-hunting-ethics-80b571de39ec> [<https://perma.cc/E457-DLDK>]; Trail Kreitzer, *The Importance of Hunting Ethics and Values*, GOHUNT (Oct. 21, 2015), <https://www.gohunt.com/read/life/the-importance-of-hunting-ethics-and-values> [<https://perma.cc/59D6-6MVJ>].

122. *See* Ted Williams, *Coyote Carnage: The Gruesome Truth About Wildlife Killing Contests*, YALE ENV'T 360 (May 22, 2018), <https://e360.yale.edu/features/coyote-carnage-the-gruesome-truth-about-wildlife-killing-contests> [<https://perma.cc/5G5V-CJ49>].

123. Act of June 30, 1914, Pub. L. No. 63-122, 38 Stat. 415.

124. FLORES, *supra* note 3, at 98.

predators.¹²⁵ Federal agents would lead a surplus horse to coyote territory, kill the horse, lace the body with poison, and return to collect the bodies of unlucky coyote scavengers.¹²⁶ By the mid-1920s, the Bureau was killing about 35,000 per year.¹²⁷ But the federal agency soon came to the same realization that the states had: Despite all of the successful killings, coyote numbers refused to diminish.¹²⁸

2. Modern Federal Coyote-Control Policy

Today, Wildlife Services (the agency in charge of federal predator-control programs) still employs poison traps to kill coyotes,¹²⁹ although not as prominently as in the early-twentieth century.¹³⁰ The federal government now uses a much more modern predator-control tactic—“aerial hunting.”¹³¹ Aerial hunting refers to the tactic of flying federal rangers, typically armed with 12 gauge shotguns, around in a helicopter and shooting every coyote they see.¹³² In 2017, Wildlife Services killed a reported 68,913 coyotes—nearly double the amount killed per year in the 1920s and 1930s.¹³³ The number of kills has stayed consistent at about 70,000 per year.¹³⁴ Since 2001, about half of these kills occur by way of aerial gunning.¹³⁵

Even with the advantage of modern poisons and aircraft-based killing, coyote populations appear to be at an all-time high.¹³⁶ Further, coyotes have expanded their range from the Great Plains and the West and are now commonly

125. *Id.* at 98, 102.

126. *Id.* at 98–99.

127. *Id.* at 102–03.

128. *Id.* at 103.

129. U.S. DEP’T OF AGRIC., M-44 DEVICE FOR PREDATOR CONTROL (2019), https://www.aphis.usda.gov/publications/wildlife_damage/fs-m44-device.pdf [<https://perma.cc/RFY4-MGX2>].

130. *See id.* (“Fifteen states, mostly in the west, authorize Wildlife Services to use M-44s Wildlife Services certified applicators cannot place M-44s within 0.5 mile of occupied residences.”).

131. ERIC M. GESE ET AL., LINES OF DEFENSE: COPING WITH PREDATORS IN THE ROCKY MOUNTAIN REGION I, 24 (2004), https://www.aphis.usda.gov/wildlife_damage/protecting_livestock/downloads/predators_booklet7.pdf [<https://perma.cc/C4A9-F7XX>].

132. *Id.*

133. FLORES, *supra* note 3, at 102–03; *Program Data Report G – 2017*, USDA, https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/pdr/?file=PDR-G_Report&p=2017:INDEX: [<https://perma.cc/FF8R-U9MR>].

134. FLORES, *supra* note 3, at 177.

135. *Id.* at 174.

136. *Coyote*, NAT’L GEOGRAPHIC, <https://www.nationalgeographic.com/animals/mammals/c/coyote/> [<https://perma.cc/6NVE-5LB2>].

found as far east as Maine, as far north as Alaska, and as far south as Guatemala.¹³⁷ Despite over a century of federal, state, local, and individual efforts put into trying to exterminate coyotes or at least limit their population, coyotes are now more numerous and widespread than ever before.¹³⁸ The question becomes this: How do coyotes thrive in the face of almost universal persecution?

C. Why the Wily Coyote Refuses to Go Away

Employees of the Bureau of Biological Survey must have been bewildered by the resiliency of coyote populations. After all, by the time their attention turned to coyotes, they had all but exterminated the U.S. wolf population with relative ease.¹³⁹ Modern science reveals several traits that make the coyote much more difficult to get rid of than their larger cousins.

1. Flexible Social Bonds

Wolves are social animals. They live their lives in packs of about 6 to 10, with the dominant pair of mates in charge.¹⁴⁰ The packs work together to bring down big game such as bison, elk, and moose.¹⁴¹ The “lone wolf” is actually an anomaly in wolf culture.¹⁴² Typically, when a wolf pup reaches a certain age, it is cast out from the familial pack and must go integrate into a new one.¹⁴³ Life for lone wolves is dangerous; they risk being killed for stepping into a foreign pack’s territory if that pack rejects them.¹⁴⁴ It was this need to operate as a pack that ultimately led to wolves’ near extinction in the early-twentieth century. When a seemingly fresh and unmolested dead

horse was found in its territory, an entire pack could be killed in one fell swoop by the poison-laced trap.¹⁴⁵

137. *North American Distribution*, URBAN COYOTE RES. PROJECT, <https://urbancoyotereseach.com/coyote-info/north-american-distribution> [https://perma.cc/RB5J-DA2T].

138. *Id.*

139. FLORES, *supra* note 3, at 103.

140. *Gray Wolf*, NAT’L GEOGRAPHIC, <https://www.nationalgeographic.com/animals/mammals/g/gray-wolf/> [https://perma.cc/JUJ5-BTDZ].

141. *Id.*

142. NATE BLAKESLEE, *AMERICAN WOLF: A TRUE STORY OF SURVIVAL AND OBSESSION IN THE WEST* 12–13 (2017).

143. *Id.*

144. *Id.*

145. *See* FLORES, *supra* note 3, at 36, 98, 101.

Coyotes, on the other hand, often live solitary lives.¹⁴⁶ Once coyote pups become about a few months old, their parents may kick them out to find their own territory.¹⁴⁷ Their flexible diet means they do not have to hunt in a pack to take down large, big-game animals to survive.¹⁴⁸ Rather, they hunt solo or in pairs pursuing small-game animals and supplement their diet with carrion and wild vegetation.¹⁴⁹ However, showing their characteristic flexibility, coyotes have also been known to occasionally hunt as a pack to take down big-game animals such as deer.¹⁵⁰ These flexible social bonds helped coyotes thrive and replace the wolf's ecological niche in the United States after that larger predator was nearly eradicated.¹⁵¹ It is this same flexibility that allows them to disperse when persecuted by humans.¹⁵² However, humans did help stop other animals from persecuting coyotes.

2. Lack of Competition

Coyotes are far from the top of the natural predator hierarchy.¹⁵³ Apart from wolves, the U.S. landscape was home to vast numbers of bears, mountain lions, wolverines, and bobcats before the war on predators in the early-twentieth century.¹⁵⁴ The larger of these predators, particularly wolves, regularly killed coyotes that the wolves perceived to be encroaching on their territory or prey.¹⁵⁵ When the wolf population dropped, coyotes became “the big dogs on the block.”¹⁵⁶ Coyotes were free to replace the wolf as the top predator in areas such as Yellowstone National Park,¹⁵⁷ as well as the Eastern Seaboard.¹⁵⁸

146. Antle, *supra* note 5, at 164.

147. *Coyotes 101*, *supra* note 22.

148. LAURAY YULE, COYOTES 23–24 (2004).

149. *Id.* at 23–24, 31–32.

150. *See* FLORES, *supra* note 3, at 36.

151. *Id.* at 101.

152. *Id.* at 36.

153. *10 Most Dangerous Predators in North America*, GAME & FISH (Apr. 9, 2015), <https://www.gameandfishmag.com/editorial/10-lethal-predators-north-america/193290> [<https://perma.cc/K6SD-J7LD>].

154. *See* Antle, *supra* note 5, at 163.

155. FLORES, *supra* note 3, at 127–28 (“But there was, you know, a real big spike in dead coyotes two, three years after wolf recovery, and 90 percent of them were at the elk carcasses that wolves killed. . . . I recall over one hundred dead coyotes the first two years.”).

156. *Id.* at 127.

157. *Id.*

158. *See North American Distribution*, *supra* note 137.

3. *Varying Litter Sizes*

Coyotes are socially flexible when they need to avoid human persecution and do not have to worry about becoming prey to larger animals in most of their habitats. But how does a population of coyotes survive after a coyote derby claims 200 of them in a weekend? The answer lies in the coyote's yipping howl.

Coyotes typically howl at night.¹⁵⁹ During mating season, the howls help eligible bachelors and bachelorettes find each other.¹⁶⁰ The howls also help establish the territory of a given coyote familial unit.¹⁶¹ Most importantly for the purpose of this Part, it also acts as a quasi-population census.¹⁶² The amount of howls that a female coyote hears corresponds with the size of her litter.¹⁶³ If the female hears less howling than usual, her body responds by producing a larger litter of pups.¹⁶⁴ If the females do not feel persecuted, their litter size shrinks to only "a couple of surviving pups."¹⁶⁵

Left alone, coyote populations in a given area tend to stabilize to the carrying capacity of that ecosystem.¹⁶⁶ For example, Yellowstone National Park's Lamar Valley housed around 80 coyotes from the late 1930s to the mid-1990s.¹⁶⁷ After gray wolves were reintroduced to the park in the 1990s and subsequently began killing their smaller canine relatives, the coyote population in Lamar Valley fell and stabilized at around 30 animals.¹⁶⁸ Naturalists believe not only do coyotes vary their litter size based on their nightly howling census but also on the availability of food.¹⁶⁹ With the reintroduction of wolves, not only were there less coyotes due to mortality but there was also less food for them due to competition.¹⁷⁰ Luckily for coyotes, they have adapted the ability to live in unconventional environments without hunting pressure or natural competition for food.

159. Harvey Specter, *5 Frequently Question You Need to Know About Coyote Howls?*, DAILY SHOOTING, <https://www.dailyshooting.com/coyotes-howl/> [[https:// perma.cc/RJ2Q-XBSR](https://perma.cc/RJ2Q-XBSR)].

160. *See id.*

161. *Id.*

162. FLORES, *supra* note 3, at 105.

163. *See id.*

164. *See id.*

165. *Id.*

166. *Id.* at 133.

167. *Id.*

168. *Id.* at 133–34.

169. *See id.* at 105.

170. *See id.* at 131–32.

4. *Habitat Adaptability*

Not only have coyotes adapted to live in habitats very different from their natural range in the Great Plains and the West into the northern, southern, and eastern parts of the continent but they have also adapted to city life.¹⁷¹ Generally, hunting within cities is only allowed under very specific circumstances,¹⁷² meaning urban coyotes do not have to fear being killed by hunters. At the same time, coyotes are happy to make their territory out of a patchwork of city parks, golf courses, and undeveloped areas.¹⁷³ Wolves, mountain lions, and bears need large areas of contiguous wilderness to live in, meaning urban coyotes have no natural predators.¹⁷⁴

Besides being able to adapt from wilderness to cityscape, coyotes have moved from the desert heat to the mountain cold.¹⁷⁵ Coyotes were commonly found in and around Aztec civilization,¹⁷⁶ where the temperature averaged in the range of 90 degrees Fahrenheit.¹⁷⁷ Coyotes now inhabit parts of Alaska,¹⁷⁸ where the average low temperatures in January hover around 11 degrees Fahrenheit.¹⁷⁹ Coyotes can live at such a wide variety of latitudes thanks to their natural, canine ability to grow and shed their fur coat as necessary.¹⁸⁰

In sum, coyotes refuse to go away because Mother Nature saw fit to give them just the right traits to survive everything humans can throw at them. Killing coyotes results in the females producing a proportional number of replacements and pushing remaining coyotes into new territory that they did not previously

171. *Id.* at 189; *About the Project*, URBAN COYOTE RES. PROJECT, <https://urbancoyotersearch.com/about-project> [https://perma.cc/ZJN6-8YEE].

172. *See, e.g.*, WEST DES MOINES, IOWA, CITY CODE § 5-2-30 (2007) (allowing hunting only on tracts of land that are at least 20 acres and if the hunter is pursuing deer or turkey, among other requirements).

173. *See* FLORES, *supra* note 3, at 195.

174. *Coyotes at Risk*, PREDATOR DEFENSE, <https://www.predatordefense.org/coyotes.htm> [https://perma.cc/TZF3-9M2Q].

175. *Id.*

176. *See* FLORES, *supra* note 3, at 9–10.

177. Chad Buleen, *Average Temperature in Mexico*, USA TODAY (Feb. 2, 2018), <https://traveltips.usatoday.com/average-temperature-mexico-14798.html> [https://perma.cc/X5Z2-36Y5].

178. *North American Distribution*, *supra* note 137.

179. *See Climate Alaska – Anchorage*, U.S. CLIMATE DATA, <https://www.usclimate.com/climate/alaska/united-states/3171> [https://perma.cc/6RZW-A9F3].

180. Janet Kessler, *How Much Rain Do You Think a Coyote's Fur Can Hold?*, COYOTE YIPPS (Feb. 18, 2017), <https://coyoteyipps.com/category/shedding/> [https://perma.cc/9HSP-SMPU].

inhabit—which can be anywhere in North America. Most coyote-related regulations do not take account of this fact, so how do Iowa’s coyote laws compare to decades of failed policies that are not based on science?

IV. CURRENT STATE OF COYOTE CONTROL IN IOWA

Iowa is not unique in that it is one of many states that treat coyotes as nuisances rather than valuable members of our ecosystem. To see the difference in treatment between an animal that Iowa values versus one that is treated as a nuisance, it is helpful to examine white-tailed deer hunting regulations.

White-tailed deer are some of Iowa’s most prized natural resources.¹⁸¹ Nonresident hunters come from all around the nation and spend thousands of dollars to hunt Iowa’s white-tailed deer.¹⁸² In order to preserve this resource and the economic boost it provides to the state, the Iowa Department of Natural Resources regulates white-tailed deer hunting with a passion.¹⁸³ Technically, one may hunt white-tailed deer from October 1st to January 27th, only with a bow and arrow, and from January 11th to the 27th, only for does (female deer).¹⁸⁴ Further, hunters must purchase a deer-transportation tag for each deer that they plan to take, in addition to a state hunting license.¹⁸⁵ A hunter can use a firearm to hunt during this time instead of a bow and arrow, but the firearm must be a muzzleloader.¹⁸⁶ For two weeks during the season, a hunter can use additional firearms—including shotguns and rifles that fire certain caliber bullets—but only if the hunter purchases an additional deer tag.¹⁸⁷ Total bag limits for white-tailed deer are based on the deer population of a given county.¹⁸⁸ Additionally, one may not bait deer into range, use an electronic caller to call deer into range, or use two-way electronic communications when hunting deer.¹⁸⁹

In contrast, one may hunt coyotes every day of the year for 24 hours a day, with any type of firearm (including high-powered rifles) and no bag limit as to how many animals the hunter may take anywhere in the state.¹⁹⁰ Nothing besides a

181. See STONE, *supra* note 42, at 60.

182. *Id.*

183. See IOWA HUNTING REGULATIONS, *supra* note 54, at 6, 29.

184. *Id.* at 6.

185. *Id.* at 29.

186. See *id.* at 6.

187. *Id.* at 6, 29.

188. *Id.* at 6.

189. *Id.* at 30.

190. IOWA ADMIN. CODE r. 571-108.5 (2019); *Hunters Turning Attention to the Wily Coyote*, *supra* note 108.

standard hunting license is required to hunt a coyote.¹⁹¹ Coyote hunters are also allowed to bait coyotes, use an electronic caller to call them in, use trained dogs to lure coyotes, and use two-way electronic communications to coordinate with other hunters during the coyote hunt.¹⁹² Clearly, coyote hunters are given several advantages that deer hunters are not. Most hunters would likely agree with this policy because most hunters enjoy hunting deer, and coyotes certainly kill deer that would otherwise be available for human hunters to take. However, killing coyotes has little to no effect on deer populations.¹⁹³ Yet the regulations (or lack thereof) allow the widely criticized¹⁹⁴ coyote derbies to go on inside of Iowa.¹⁹⁵ On the one hand, there is no risk of pushing coyotes to extinction due to hunting.¹⁹⁶ However, there is a better way to preserve the sport of coyote hunting while having regulations that respect and account for the value that coyotes bring to Iowa's ecosystems.

V. A BETTER SCHEME FOR IOWA'S ECOSYSTEMS

In light of the science discussed thus far, the economics of coyotes' benefit to states, and the ample number of examples of failed coyote-control policies, Iowa's coyote-hunting regulations could use some work. Iowa's current regulations do not reflect the value of coyotes and allow for the unethical treatment of these unique and beneficial predators. Iowa can remedy this situation by implementing simple and familiar wildlife-management policies in the areas deemed appropriate by wildlife-management professionals.

A. Establish a Coyote-Hunting Season

The reality is that most coyote hunting occurs after the regular deer-archery

191. IOWA HUNTING REGULATIONS, *supra* note 54, at 5.

192. *Id.* at 13; *Hunters Turning Attention to the Wily Coyote*, *supra* note 108.

193. See FLORES, *supra* note 3, at 137; Tavis Forrester, *Do Coyotes Cause Deer Decline?*, EMAMMAL (Apr. 1, 2015), <https://emammal.si.edu/okaloosa-science-home-page/blog/do-coyotes-cause-deer-declines> [https://perma.cc/J87V-6ZR6] (“[R]esearchers concluded that coyotes actually had a stabilizing effect on the deer herd.”).

194. See Perry Vandell, *Upcoming Coyote-Killing Contest Draws Ire from Arizona Town, Animal-Rights Groups*, AZCENTRAL (Dec. 14, 2018), <https://www.azcentral.com/story/news/local/arizona/2018/12/14/coyote-killing-contest-arizona-draws-ire-groups/2306036002/> [https://perma.cc/7MGQ-QHWQ]; *The Hidden War on Wildlife: Killing Contests in North America*, PROJECT COYOTE, <http://www.projectcoyote.org/wkc/> [https://perma.cc/49MD-4EWJ].

195. Southwest Iowa Coyote Calling, FACEBOOK, <https://www.facebook.com/pages/category/Community/Southwest-Iowa-Coyote-Calling-214293329037126/> [https://perma.cc/4CDR-43B5]; Williams, *supra* note 122.

196. See *supra* Part III.C.

season ends on January 10th.¹⁹⁷ It is at this point that regular hunters no longer fear spooking deer in their hunting spots with the sound of high-powered rifles going off.¹⁹⁸ It also happens to be the dead of winter, when a coyote's fur is at its thickest and most valuable.¹⁹⁹ The season could end sometime before April because coyote breeding season generally runs from December through March.²⁰⁰ Allowing hunting during breeding season means hunters can be successful using the widest range of calls,²⁰¹ and cutting the season off after breeding season is over allows the surviving coyote

families to raise their pups in peace. Iowa would not be the first state to establish a coyote-hunting season.²⁰² Of course, a season will not prevent coyote derbies if there is no bag limit.

B. Establish a Bag Limit

Science has revealed not having a bag limit on coyotes provides no benefit to an ecosystem and allows for unnecessary coyote slaughter.²⁰³ A bag limit could incentivize hunters to shoot only large, mature coyotes, leaving the younger and smaller animals to grow and enjoy another year of life before being considered for a shot again. This policy would also not do away with coyote hunting competitions but instead reform them, so the winner would be awarded for the quality of the animal, rather than the quantity.

C. Prohibit Practices That Give Hunters an Unreasonably Unfair Advantage

A central tenant of hunting is a "fair chase."²⁰⁴ A fair chase is "the ethical, sportsmanlike, and lawful pursuit and taking of any free-ranging wild, [native

197. *Hunters Turning Attention to the Wily Coyote*, *supra* note 108.

198. *See id.*

199. Kessler, *supra* note 180.

200. *Coyotes 101*, *supra* note 22.

201. *See* Ben Romans, *Snow Dogs: Hunting the Coyote Rut*, FIELD & STREAM (Jan. 19, 2015), <https://www.fieldandstream.com/articles/hunting/2015/01/snow-dogs-hunting-the-coyote-rut> [<https://perma.cc/D2TF-X77Y>]. Just because coyotes are valuable does not mean we should prohibit hunters from using their full arsenal of skills.

202. Smith, *supra* note 106.

203. *See supra* Part III.C.

204. *See Fair Chase Statement*, BOONE & CROCKETT CLUB, https://www.boone-crockett.org/huntingEthics/ethics_fairchase.asp [<https://perma.cc/T8HH-T784>].

North American] big game animal in a manner that does not give the hunter an improper or unfair advantage over the game animals.”²⁰⁵ This value is currently reflected in Iowa’s deer-hunting regulations wherein Iowa prohibits deer hunters from either using bait to lure in deer or using two-way electronic communications to coordinate the taking of deer.²⁰⁶ Coyote hunters should have to comply with the same ethical standards. Coyotes, like deer, rely on their acute sense of smell to find food, find comrades, and avoid trouble.²⁰⁷ The current regulations, however, allow a coyote hunter to bait a coyote by throwing a pound of rotten ground beef into a field and waiting for the scent of rotting flesh to draw in a hungry coyote scavenger.²⁰⁸ This would seem to be an unfair advantage, even if some hunters would only use meat from other wild game that they had killed. Likewise, if deer hunters are not allowed to use two-way electronic communications such as radios, then coyote hunters should not be allowed to either.²⁰⁹ Iowa’s regulations already set forth the ethics of fair chase, and it is simply a matter of applying these principles to all of our game animals.

This is not to say that all deer-hunting regulations should be applied to coyote hunting. The natural world is nuanced, and our hunting regulations should be as well. Several existing coyote-hunting regulations reflect the differences in hunting deer versus coyotes.

For example, to have a reasonable chance of success, a coyote hunter will likely need to use a high-powered rifle. Rarely can one get close enough to kill a coyote with a bow and arrow.²¹⁰ There are many rifle calibers designed for coyote-sized targets, such as a .223 Remington and .22–.250 caliber ammo.²¹¹ However, larger calibers such as .308, .338, and .450 Bushmaster are probably overkill.²¹²

205. *Id.*

206. IOWA HUNTING REGULATIONS, *supra* note 54, at 30.

207. YULE, *supra* note 148, at 15, 23; *Deer Scents Guide: The How, When, and Why of Deer Scents*, BONE COLLECTOR (Sept. 26, 2016), <https://www.bonecollector.com/deer-scents-guide-deer-scents/> [<https://perma.cc/9TCM-NWE2>].

208. *See* IOWA HUNTING REGULATIONS, *supra* note 54, at 30.

209. *See id.*

210. Mark Kayser, *3 Secrets for Bowhunting Coyotes*, PETERSEN’S BOWHUNTING (Feb. 9, 2016), <http://www.bowhuntingmag.com/editorial/3-secrets-for-bowhunting-coyotes/309232#> [<https://perma.cc/2SEW-KZ33>] (“Some consider bowhunting coyotes as a stunt. . . . Without the advantage of bullet distance, you need to use every big game strategy you know and add savvy predator tricks to your game plan.”).

211. Mark Kayser, *Coyotes and Varmints: The Best Predator Hunting Caliber?*, GRAND VIEW OUTDOORS (Sept. 11, 2018), <https://www.grandviewoutdoors.com/predator-hunting/the-best-predator-calibers> [<https://perma.cc/2WX5-KPDE>].

212. *Id.* (“Sure, the .308 is a bit on the overkill side. . . .”). If an enthusiastic predator hunter concedes a caliber is “a bit on the overkill side,” then it probably is. *See id.*

Iowa should develop a list of approved calibers for coyote hunting that allow hunters to have a reasonable chance of success without needlessly sending overly powerful bullets flying miles through the countryside.

Likewise, electronic calls should remain legal for coyote hunters. Apart from their keen sense of smell, coyotes also have excellent vision and hearing.²¹³ An electronic caller gives beginner coyote hunters a reasonable chance of success because mimicking actual animal noises well enough to draw in a wild predator takes hours of practice to become proficient and years to master.²¹⁴

D. Establish a Depredation Unit for Troublesome Coyotes

In any group of living creatures, there are a few bad apples. Iowa should create a mechanism by which landowners and citizens who encounter coyotes can report problem coyotes and have them removed by government professionals or willing coyote hunters. Iowa already has a similar mechanism for troublesome deer.²¹⁵ The focus should be on controlling coyote *behavior*, not coyote populations.²¹⁶ Even Wildlife Services is starting to realize this.²¹⁷

VI. CONCLUSION

The governments and citizens of the United States have relentlessly persecuted coyotes for over a century now. Modern ecology, economics, and science have shown us this hostility is uncalled for. Coyotes have a nominal negative effect on livestock and hunted big-game animals and play a major role in controlling invasive pests that damage our agricultural sector. However, most policies at all levels of government treat coyotes like noxious beasts. The result of these campaigns against coyotes has been the spread of these resilient canines across the continent, even into our cities, with a larger-than-ever population.

Legislators and regulators should have an understanding of the history of coyotes in the United States and the reason that they are in the food chain in the

213. USDA WILDLIFE SERVS., LIVING WITH WILDLIFE: COYOTES, https://www.aphis.usda.gov/wildlife_damage/nwrc/publications/living/coyotes.pdf [<https://perma.cc/XLH8-8PKZ>].

214. Brad Fitzpatrick, *8 Mistakes Rookie Coyote Hunters Make*, REALTREE (Dec. 4, 2018), <https://www.realtree.com/predator-hunting/articles/8-mistakes-rookie-coyote-hunters-make> [<https://perma.cc/T86B-U2P6>] (“The reliability of today’s electronic calls make it easy for anyone to go out and give it a try without worrying whether or not they are making a correct sound with a hand call . . .”).

215. See IOWA CODE § 481C.2A (2019).

216. See FLORES, *supra* note 3, at 177–78.

217. See *id.*

first place. Most states' coyote-hunting policies are based on an outdated understanding of the role that predators play in ecosystems. Iowa's citizens, hunters, and wildlife can benefit from reforming regulations to ensure coyotes have the same opportunity of fair chase as other, more favored species enjoy. Reforms could not only benefit Iowa's economy and ecosystem but would also show the public that hunters are willing to adapt to change after learning more about the natural world. Hunter numbers are

declining,²¹⁸ and winning the public relations battle can help reverse that trend. Coyote hunting is a sport worth preserving, and changing the sport as we learn more about coyotes will ensure the next generation has the same opportunities that hunters enjoy today.

*Alexander LeSher**

218. Natalie Krebs, *Why We Suck at Recruiting New Hunters, Why It Matters, and How You Can Fix It*, OUTDOOR LIFE (Oct. 15, 2019), <https://www.outdoorlife.com/why-we-are-losing-hunters-and-how-to-fix-it>.

* B.A., Iowa State University, 2016; J.D. Candidate, Drake University Law School, 2020. The Author would like to thank his parents for their unwavering support over the last three years.