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PULLING THE TRIGGER ON HUNTING REGULATIONS FOR LEAD AMMUNITION

“Like the resource [they] seek[] to protect . . . conservation [efforts] must be dynamic, changing as conditions change, seeking always to become more effective.”¹

I. IT ALL STARTS WITH A BANG: AN INTRODUCTION TO THE HARMFUL EFFECTS OF LEAD AMMUNITION

In 2018, researchers at Yellowstone National Park placed a Global Positioning System (GPS) tracker on a five-year-old female golden eagle to record her movements.² The tracker revealed the bird flew to an area frequented by hunters, where she likely ingested bullet fragments while scavenging carrion.³ Four months later, the researchers found the eagle dead.⁴ The necropsy confirmed the cause of death was lead poisoning.⁵

Lead poisoning can cause a slow and painful death for animals.⁶ Within twenty-four hours of the eagle’s consumption of

1. RACHEL L. CARSON, *Guarding Our Wildlife Resources*, in 5 CONSERVATION IN ACTION 1, 2 (Fish & Wildlife Serv. 1948) (advocating for effective wildlife conservation in North America).

2. Mead Gruver, *Lead Kills First Yellowstone Golden Eagle Fitted with Tracker*, ASSOCIATED PRESS (Apr. 15, 2019, 11:59 PM), <https://apnews.com/article/2f1249b76b284ec4bcc90bf0e606c11a> (stating researchers fitted GPS tracker on golden eagle). This was the first time scientists fitted a tracking device on a golden eagle in Yellowstone National Park. Brian Niemietz, *Golden Eagle Fitted with a Tracker in Yellowstone Died from Lead Poisoning*, DAILY NEWS (Apr. 15, 2019, 7:09 PM), <https://www.nydailynews.com/news/national/ny-dead-eagle-tracker-yellowstone-lead-2019-0415-32xjb2j72zcoljdv44hyim3wgi-story.html> (highlighting importance of golden eagle’s tracking device).

3. *Id.* (explaining park officials believe eagle ingested bullet fragments from animal hunter left behind). Carrion is the decaying flesh of a dead animal. *Carrion*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/carrion> (last visited Nov. 7, 2021) (defining carrion).

4. *See* Niemietz, *supra* note 2 (noting researchers found eagle dead).

5. *Id.* (indicating lead poisoning caused eagle’s death); Gruver, *supra* note 2 (explaining lead poisoning presents higher threat in fall and winter, when eagles usually roam and search for carrion).

6. *See* Nancy H. Golden, Sarah E. Warner & Michael J. Coffey, *A Review and Assessment of Spent Lead Ammunition and Its Exposure and Effects to Scavenging Birds in the United States*, 237 REVS. OF ENV’T CONTAMINATION & TOXICOLOGY 123, 130 (2016), https://soarraptors.org/wp-content/uploads/USFWS_Review-and-Assessment-paper.pdf (noting lead poisoning is “chronic condition resulting in anorexia, loss of fat reserves, muscle wasting, and debilitation”). Depending on the amount and form of lead ingested, an animal can develop acute or chronic lead toxicity. Sarah Kolb, *Lead Toxicity: A Threat to Wildlife*, TODAY’S VETERINARY NURSE (Summer 2018), <https://todaysveterinarynurse.com/articles/management-strategies-lead->

lead, digestive stomach acids would have broken down the metal, allowing it to enter the bloodstream.⁷ The bloodstream then distributed the lead to the eagle's "internal organs, the nervous system, the respiratory system, and the renal system."⁸ The lead poisoning probably caused her to lose coordination, an effect analogous to a person driving while under the influence.⁹ Unable to fly straight, the eagle may have collided into trees, broken bones, and sustained head trauma.¹⁰ The bird may also have suffered from anemia, which saps away any energy to find food.¹¹ Even if a human or other predator approached her, she would not have had the strength to fly away.¹² After a few months, the eagle died from a bullet that a hunter likely meant for another animal.¹³

toxicity-a-threat-to-wildlife/ (comparing chronic and acute lead toxicity). "Chronic lead toxicity is extended lead exposure at a level that does not cause immediate organ failure and death but may eventually result in death." *Id.* (describing chronic lead toxicity). In contrast, high levels of lead exposure cause acute lead toxicity, leading to a more rapid death. *Id.* (defining acute lead toxicity).

7. See *How Do Raptors Get Lead Poisoning?*, WILDLIFE CTR. OF VA., <https://www.wildlifecenter.org/how-do-raptors-get-lead-poisoning> (last visited Dec. 20, 2020) (tracing process through which eagle's body absorbs lead). Lead is extremely potent — a piece of lead the "size of a grain of rice" is sufficient to kill some species. *Id.* (explaining even small amounts of lead can kill eagles).

8. *Id.* (describing how body distributes lead); see Mohammed Abdulrazzaq Assi, *The Detrimental Effects of Lead on Human and Animal Health*, 9(6) VETERINARY WORLD 660, 662 (June 27, 2016), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4937060/pdf/VetWorld-9-660.pdf> (analyzing lead's effects on wildlife).

9. See *Lead Ammunition Overview*, TETON RAPTOR CTR., <https://tetonraptorcenter.org/our-work/lead-ammunition> [<https://web.archive.org/web/20210204113500/https://tetonraptorcenter.org/our-work/lead-ammunition>] (last visited Dec. 20, 2020) (detailing lead's impact on coordination); see also *Lead Poisoning in Raptors at the Wildlife Center*, WILDLIFE CTR. OF VA., <https://www.wildlifecenter.org/lead-poisoning-raptors-wildlife-center> (last visited Jan. 23, 2021) (comparing lack of coordination due to lead poisoning to alcohol intoxication).

10. See *Lead Ammunition Overview*, *supra* note 9 (expressing eagles admitted to Teton Raptor Center often have broken bones and head trauma).

11. See Golden, Warner & Coffey, *supra* note 6, at 133 (explaining how lead impacts birds). Anemia occurs when there are not enough "healthy red blood cells to carry adequate oxygen" to the body's tissues. See *Anemia*, MAYO CLINIC, <https://www.mayoclinic.org/diseases-conditions/anemia/symptoms-causes/syc-20351360> (last visited Dec. 20, 2020) (defining anemia). Anemia would cause the eagle to feel lethargic. Steven L. Marks & Allison Kendall, *Anemia in Animals*, MERCK VETERINARY MANUAL, <https://www.merckvetmanual.com/circulatory-system/anemia/anemia-in-animals> (Oct. 2019) (describing anemia's effect in animals).

12. *Lead Poisoning*, CANADIAN WILDLIFE HEALTH COOP., http://www.cwhc-rcsf.ca/docs/fact_sheets/Lead_Poisoning.pdf (last visited Dec. 20, 2020) (re-marking wildlife with lead poisoning fail to trigger "escape response" to predators).

13. See Gruver, *supra* note 2 (summarizing length of time to eagle's death from lead poisoning); see also Niemietz, *supra* note 2 (noting eagle died from ingested lead bullet).

This Comment argues in favor of a national ban on lead ammunition for hunting purposes.¹⁴ Part II examines the harmful effects of lead on humans, wildlife, and the environment.¹⁵ Part III provides an overview of the arguments against and in support of a lead ammunition ban.¹⁶ It concludes by surveying the regulations, statutes, and caselaw addressing restrictions on lead ammunition.¹⁷ Part IV explores recent federal and state efforts to regulate hunters' use of lead ammunition.¹⁸ Part V traces the implications of continued use of non-lead ammunition for wildlife and the environment.¹⁹ Finally, Part VI urges Congress to implement legislation requiring hunters to use non-lead ammunition.²⁰

II. SHOOTING OURSELVES IN THE FOOT: LEAD'S IMPACT ON WILDLIFE, THE ENVIRONMENT, AND HUMANS

Lead's physical properties and low cost make it the preferred metal for "batteries, caulks, pigments, dyes, paints, gasoline . . . ammunition, and fishing sinkers."²¹ Nonetheless, lead's harmful effects on humans prompted federal laws banning it from paint, toys, gasoline, and other products.²² To date, however, no federal law completely bans hunters from using lead ammunition on public land, even though studies show lead ammunition is deadly to wildlife, humans, and plants.²³

14. For an analysis of the need for a national ban on lead ammunition, see *infra* notes 178-96 and accompanying text.

15. For a discussion of the harmful effects of lead on humans, wildlife, and the environment, see *infra* notes 22-36 and accompanying text.

16. For a discussion of both sides of the debate surrounding lead ammunition restrictions, see *infra* notes 40-66 and accompanying text.

17. For a discussion of the caselaw, regulations, and statutes addressing lead ammunition restrictions, see *infra* notes 67-97 and accompanying text.

18. For a discussion of recent state and federal efforts to implement lead ammunition regulations, see *infra* notes 98-177 and accompanying text.

19. For a discussion of the positive impact of a lead ammunition ban on wildlife and the environment, see *infra* notes 178-92 and accompanying text.

20. For a discussion urging Congress to implement a federal lead ammunition ban for hunting, see *infra* notes 193-96 and accompanying text.

21. Kolb, *supra* note 6 (describing positive aspects of lead and its uses). These physical properties include lead's "high density, low melting point, malleability, [and] corrosion resistance." *Id.* (listing lead's chemical properties).

22. See *Federal Agency Bans Lead Ammunition for Depredation of Hunting Birds*, AM. BIRD CONSERVANCY (Feb. 10, 2011), <https://abcbirds.org/article/federal-agency-bans-lead-ammunition-for-depredation-hunting-of-birds/> (noting paint, gasoline, toy, home building, and automotive industries have removed lead from products).

23. See *Lead Regulations*, U.S. ENV'T PROT. AGENCY, <https://www.epa.gov/lead/lead-regulations#paint> (last visited Dec. 20, 2020) (listing regulations and statutes governing use of lead in materials). Emphasizing the need for lead ammunition regulations, then-Director of the American Bird Conservancy, Dr. Michael Dry, explained that lead's lethal environmental effects are "so well documented" in the

Scientific literature reports that lead ammunition has negatively impacted at least 130 species of animals.²⁴ Lead exposure can cause lethargy, weakness, organ failure, and emaciation, all of which may result in an animal's death.²⁵ Lead exposure can also produce behavioral changes that make animals vulnerable to predation.²⁶

Moreover, lead ammunition negatively impacts the environment.²⁷ It can remain in an area for one hundred to three hundred years.²⁸ When spent lead ammunition accumulates, it pollutes nearby soil, surface water, and ground water, and contaminates the "leaves, stems, and roots" of plant species in the surrounding area.²⁹ This contamination process results in increased concentrations of lead in highly-hunted areas, such as dove fields.³⁰ Accordingly, lead accumulation will persist so long as hunters continue to litter the environment with it.³¹

Lead exposure has a debilitating effect on humans.³² Consumption of lead can cause "high blood pressure, hearing loss,

science community that the intentional release of lead into the environment should be "unacceptable." *Id.* (emphasizing lead's recognized toxic impact).

24. See *Lead Poisoning Index*, CTR. FOR BIOLOGICAL DIVERSITY, https://www.biologicaldiversity.org/campaigns/get_the_lead_out/lead_poisoning_index.html (last visited Jan. 22, 2021) (citing lead poisoning's detrimental effects on various species).

25. *Lead Poisoning*, *supra* note 12 (describing symptoms of lead poisoning in wild birds).

26. Molly A. Tranel & Richard O. Kimmel, *Impacts of Lead Ammunition on Wildlife, the Environment, and Human Health – A Literature Review and Implications for Minnesota*, in *INGESTION OF LEAD FROM SPENT AMMUNITION: IMPLICATIONS FOR WILDLIFE AND HUMS* 318, 319 (R.T. Watson, M. Fuller, M. Pokras & W.G. Hunt eds., 2008), <https://science.peregrinefund.org/legacy-sites/conference-lead/PDF/0307%20Tranel.pdf> (listing species affected by lead poisoning).

27. Humane Soc'y of the U.S. et al., *Petition of Rulemaking to Require the Use of Nontoxic Ammunition*, U.S. FISH & WILDLIFE SERV. 1, 26 (Oct. 5, 2009) [hereinafter *2009 Petition to DOI*], https://www.fws.gov/cno/es/CalCondor/PDF_files/HSUS-Petition.pdf (detailing impact of lead contamination where use of lead ammunition is allowed, including woodlands, wetlands, agricultural fields, and areas near shooting ranges).

28. *Id.* (explaining how long lead takes to decompose).

29. *Id.* (describing how lead contaminates trees); *Lead*, PLANTPROBS, <https://plantprobs.net/plant/nutrientImbalances/lead.html> (last visited Feb. 19, 2021) (illustrating lead's toxic effect on plants).

30. *Dove Hunters Asked to Consider Stocking Up on Nontoxic Shot as Season Approaches*, AM. BIRD CONSERVANCY (Aug. 13, 2013), <https://abcbirds.org/article/dove-hunters-asked-to-consider-stocking-up-on-nontoxic-shot-as-season-approaches/> (noting dove hunters deposited around 4.5 million tons of lead into environment in 2011).

31. See *2009 Petition to DOI*, *supra* note 27, at 25 (indicating lead accumulates in environment).

32. See *id.* at 22 (explaining lead threatens human health).

[and] anemia . . . as well as . . . nerve disorders, muscle and joint pain[,]” and death.³³ Even trace amounts of lead can be harmful, leading to “kidney disease and impacts to the cardiovascular system.”³⁴ When hunters use lead ammunition to kill an animal, the bullet fractures into hundreds of tiny pieces.³⁵ Hunters and their families then consume these small pieces, exposing themselves to lead and its toxic effects.³⁶

III. LOCK AND LOAD: THE SOCIAL AND LEGAL FRAMEWORK UNDERLYING A LEAD AMMUNITION BAN

A national lead ammunition ban for hunters requires the support of Congress and the public.³⁷ In 1986, strong public support prompted the United States Fish and Wildlife Service (FWS) to prohibit the use of lead ammunition for hunting waterfowl.³⁸ Efforts to encourage the Environmental Protection Agency (EPA) to expand this limited lead ammunition ban to cover other animals under the Toxic Substances Control Act (TSCA) fell short, as both the EPA and the United States Court of Appeals for the District of Columbia found the EPA does not have the statutory authority to regulate lead ammunition.³⁹

33. See *id.* (describing symptoms of lead poisoning in humans).

34. Sam Totoni, James Fabisiak & Martha Ann Terry, *Lead in Hunted Meat: Who's Telling Hunters and Their Families?*, ENV'T HEALTH NEWS (Feb. 25, 2020), <https://www.ehn.org/lead-ammunition-in-meat-2645108170.html> (specifying low levels of lead are still harmful to humans).

35. See *Lead Ammunition Overview*, *supra* note 9 (explaining lead is designed to fragment upon impact and cause maximum damage to animals).

36. Totoni, *supra* note 34 (noting some hunters' concern regarding lead exposure of families). Because the “effects of lead on people may range from subtle to severe,” many hunters may not recognize the impact of the lead they consume. Lynne Peebles, *In the Battle Over Lead Ammunition, Science Collides with Culture*, UN-DARK (Jan. 30, 2017), <https://undark.org/2017/01/30/lead-ammunition-bullets-hunting-copper/> (describing effects of lead on humans). It is also difficult for doctors to identify lead as the source of a person's illness because the symptoms of lead poisoning mimic those of other diseases. *Lead Poisoning*, UNIV. OF MICH. HEALTH, <https://www.uofmhealth.org/health-library/hw119898> (last visited Feb. 20, 2021) (discussing difficulty of diagnosing lead poisoning).

37. For a discussion of the debate surrounding a lead ammunition ban, see *infra* notes 40-66 and accompanying text.

38. For a discussion of the ban on lead ammunition for hunting waterfowl, see *infra* notes 67-75 and accompanying text. Waterfowl are birds that “frequent[] water,” including ducks and geese. *Waterfowl*, MERRIAM WEBSTER, <https://www.merriam-webster.com/dictionary/waterfowl> (last visited Dec. 24, 2020) (defining waterfowl).

39. For a discussion of lead ammunition restrictions under the TSCA, see *infra* notes 76-97 and accompanying text.

A. Debate Over Lead Ammunition Alternatives and a Ban

Although lead is the most popular form of ammunition for hunters, various non-toxic forms of ammunition exist.⁴⁰ The FWS defines non-toxic ammunition as “any shot type that does not cause sickness and death when ingested.”⁴¹ Despite the availability of non-toxic alternatives to lead, there is significant pushback on a lead ammunition ban.⁴²

1. *Opponents of a Lead Ammunition Ban*

Opponents of a ban insist lead ammunition does not harm wildlife populations.⁴³ Hunt for Truth Association, a nonprofit organization founded by the firearms industry, claims the lead in bullets is “not sufficiently soluble in the digestive tract of scavengers to result in poisoning.”⁴⁴ Instead, Hunt for Truth alleges the lead fragments pass through the animal quickly, as the animal digests the food it consumed along with the ammunition.⁴⁵

Opponents also view a lead ammunition ban as a slippery slope towards increased gun regulation.⁴⁶ A ban “might be seen as more of an attack on hunters and the Second Amendment than . . . a conservation effort.”⁴⁷ The National Rifle Association (NRA) perceives lead bullets as not just a type of ammunition, but also as part

40. *Lead Ammunition Overview*, *supra* note 9 (noting popularity of lead bullets for hunting); see 50 C.F.R. § 20.21(j)(1) (2019) (listing non-toxic alternatives to lead).

41. See *Hunting: Nontoxic Shot Regulations for Hunting Waterfowl and Coots in the U.S.*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/birds/bird-enthusiasts/hunting/nontoxic.php> (Dec. 21, 2020) (defining non-toxic ammunition). Nontoxic alternatives include steel, copper, and tungsten. See 50 C.F.R. § 20.21(j)(1) (specifying non-toxic alternatives to lead ammunition).

42. See *Traditional Ammunition (Lead)*, NAT’L RIFLE ASS’N INST. FOR LEGIS. ACTION, <https://www.nraila.org/campaigns/huntingconservation/facts-at-a-glance-traditional-ammo/> (last visited Dec. 24, 2020) (characterizing advocates for lead ammunition regulation as “anti-hunting groups and gun control supporters”).

43. *Id.* (claiming traditional ammunition does not have negative impact on wildlife).

44. *Myths: Claims and Truths*, HUNT FOR TRUTH ASS’N, <http://www.huntfortruth.org/myths/> (last visited Dec. 24, 2020) (explaining ingested lead fragments do not cause lead poisoning).

45. *Id.* (describing why lead does not poison animals).

46. See P. Kenneth Burns, *PA Game Commission Warns of Lead’s Danger to Animals, But Hunters Say Alternative Ammo Too Expensive*, PITTSBURG’S NAT’L PUB. RADIO NEWS STATION (Dec. 5, 2019, 4:10 AM), <https://www.wesa.fm/post/pa-game-commission-warns-leads-danger-animals-hunters-say-alternative-ammo-too-expensive#stream/0> (reporting some hunters’ views on lead ammunition regulation).

47. *Id.* (providing Philadelphia hunter’s opinion on ban).

of a hunter's heritage and way of life.⁴⁸ Efforts to regulate lead ammunition have prompted slogans such as “better dead, than a life without lead.”⁴⁹ Moreover, the NRA alleges that the goal of a lead ammunition ban is ultimately to prohibit hunting altogether.⁵⁰ In support of the view that restrictions on lead ammunition serve as a step towards a complete ban on hunting, opponents contend that non-lead alternatives are cost-prohibitive to hunters.⁵¹ For instance, copper bullets cost about thirty percent more than low-cost soft core lead bullets.⁵²

Further, opponents of a ban consider lead ammunition to be more effective than non-toxic alternatives.⁵³ Manufacturers design lead bullets to shatter on impact.⁵⁴ This fragmentation creates large areas of internal damage, allowing hunters to kill animals more humanely.⁵⁵

Finally, wildlife authorities and public officials may be reluctant to support a ban on lead ammunition for fear of alienating hunters.⁵⁶ Hunters bring in revenue that funds “conservation pro-

48. See *Traditional Ammunition (Lead)*, *supra* note 42 (referring to lead ammunition as “traditional ammunition” to emphasize hunting as part of cultural heritage).

49. Sandeep Ravindran, *Banning Lead Ammunition Could Give Condors a Chance*, NAT'L GEOGRAPHIC (Oct. 14, 2013), <https://www.nationalgeographic.com/news/2013/10/131014-lead-ammunition-ban-condor-california-science/> (noting opposition to lead ammunition regulations).

50. See *Traditional Ammunition (Lead)*, *supra* note 42 (identifying alleged ultimate purpose of lead ammunition regulations).

51. See *Myths: Claims and Truths*, *supra* note 44 (asserting lead is cheaper than alternatives).

52. See *Lead Cored Bullets vs. Copper; Ballistics, Cost of Switching, Penetration, Fragmentation & More*, SHOOTING RANGE INDUS. LLC, <http://www.shootingrangeindustries.com/lead-cored-bullets-vs-copper-ballistics-cost-of-switching-penetration-fragmentation-more/> (last visited Aug. 16, 2021) (observing non-toxic alternatives are slightly more expensive than low-cost lead ammunition).

53. *Homogenous Copper Bullets Can Be Inhumane*, TERMINAL BALLISTICS RSCH., <https://www.ballisticstudies.com/Knowledgebase/Homogenous+copper+bullets+can+be+inhumane.html> (last visited Jan. 11, 2021) (arguing lead bullets are more lethal than non-lead alternatives).

54. See *Lead Ammunition Overview*, *supra* note 9 (describing purpose behind fracturing of lead bullets).

55. See *id.* (outlining how lead bullets are designed to kill animals).

56. See Ian Urbina, *Poisoned Wildlife and Tainted Meat: Why Hunters Are Moving Away from Lead Bullets*, N.Y. TIMES (Nov. 24, 2018), <https://www.nytimes.com/2018/11/24/us/ammunition-lead-bullets-condors.html> (noting reluctance surrounding lead ammunition ban); see also Jillian Mock, *Lead Ammo, the Top Threat to Condors, Is Now Outlawed in California*, NAT'L AUDUBON SOC'Y (July 1, 2019), <https://www.audubon.org/news/lead-ammo-top-threat-condors-now-outlawed-california> (explaining ban on lead ammunition could “alienate hunters, breed[] bitterness and mak[e] them unwilling to comply with the law and switch to other options”).

grams, enforcement and research.”⁵⁷ Hunters also pay for “license fees and excise taxes on guns, ammunition and angling equipment[,]” which account for “sixty percent of the funding for state wildlife agencies.”⁵⁸ In 2016, for instance, hunters and fishers spent eighty-one billion dollars on expenses relating to hunting and fishing, ten percent of which went towards “licenses, stamps, tags, . . . permits[,]” and other expenditures.⁵⁹

2. *Proponents of a Lead Ammunition Ban*

Conversely, proponents of a ban cite studies conducted as early as 1965 that point to the toxic effects of lead ingestion in wildlife.⁶⁰ Proponents note the price of non-lead ammunition is about the same as premium lead ammunition.⁶¹ Indeed, as non-lead alternatives rise in popularity, higher production rates may reduce the difference between the two prices.⁶² Ammunition is also the least costly aspect of hunting — the benefits of non-lead ammunition for the environment, animals, and human health may outweigh the marginal price difference between low-cost lead ammunition and lead-free ammunition.⁶³

Proponents also argue that non-lead ammunition is just as lethal as lead ammunition despite their difference in design.⁶⁴ Cop-

57. Urbina, *supra* note 56 (outlining wildlife conservation programs that hunting funds).

58. Nathan Rott, *Decline in Hunters Threatens How U.S. Pays for Conservation*, NAT'L PUB. RADIO (Mar. 20, 2018, 6:31 AM), <https://www.npr.org/2018/03/20/593001800/decline-in-hunters-threatens-how-u-s-pays-for-conservation> (specifying how hunters bring in funds). A federal program, Duck Stamp, requires hunters to purchase a license to hunt waterfowl. *Hunting as Conservationists*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/refuges/hunting/hunters-as-conservationists/> (Feb. 12, 2018) (describing Duck Stamp program). Ninety-eight cents of every dollar hunters spend on Duck Stamps go towards purchasing “vital habitat[s] or acquir[ing] conservation easements within the National Wildlife Refuge System.” *Id.* (explaining how Duck Stamp program helps conservation efforts).

59. *2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*, U.S. FISH & WILDLIFE SERV. 1, 5 (2016), https://www.fws.gov/wsfrprograms/subpages/nationalsurvey/nat_survey2016.pdf (summarizing U.S. sportspersons' expenditures in 2016).

60. *See generally* Golden, Warner & Coffey, *supra* note 6, at 133 (citing several studies that found ingesting lead is harmful to waterfowl).

61. *See Resources for Hunters*, WILDLIFE CTR. OF VA., <https://www.wildlifecenter.org/resources-hunters> (last visited Jan. 11, 2021) (remarking price of non-toxic and premium lead ammunition is equivalent).

62. *Lead Cored Bullets vs. Copper*, *supra* note 52 (predicting alternative ammunition may reduce lead ammunition price).

63. *See Resources for Hunters*, *supra* note 61 (noting greater benefits of lead-free ammunition).

64. *See* Felix Gremse et al., *Performance of Lead-Free Versus Lead-Based Hunting Ammunition in Ballistic Soap*, 9 PLOS ONE e102015, e102015 (July 16, 2014), <https://doi.org/10.1371/journal.pone.0102015>

per bullets “mushroom,” or expand into “frontal petals” instead of fragmenting like lead bullets.⁶⁵ As such, non-toxic bullets made from steel, copper, and tungsten kill animals cleanly by cutting through them like knives.⁶⁶

B. Lead Shot and the Waterfowl Ban

The Department of the Interior (DOI) protects and conserves federal land and wildlife.⁶⁷ The FWS, a bureau within the DOI, is charged with protecting threatened and endangered species, conserving wildlife habitats, and enforcing wildlife laws.⁶⁸ Although researchers first reported incidences of waterfowl mortality by lead poisoning from bullets in 1894, the FWS did not move to phase out the use of lead shot for waterfowl until almost one hundred years later in 1986.⁶⁹ That year, an estimated 1.5 million ducks and eighty thousand geese died from ingesting spent lead ammunition.⁷⁰ The FWS then successfully implemented a complete ban on lead ammunition for hunting “waterfowl, coots, and certain other species” in 1991.⁷¹ Almost a decade later, a study found the ban saved millions of waterfowl from fatally ingesting lead ammunition.⁷²

www.ncbi.nlm.nih.gov/pmc/articles/PMC4100882/pdf/pone.0102015.pdf (finding no difference in lead and copper’s ability to kill based on results from experiments and studies).

65. Golden, Warner & Coffey, *supra* note 6, at 136 (detailing copper bullets’ transformation on impact).

66. *See id.* (comparing lead and non-lead ammunition).

67. *See 2009 Petition to DOI*, *supra* note 27, at 37 (detailing DOI’s function). The DOI “manages one-fifth of all the land in the United States.” Valerie Volcovici, *New Interior Head Lifts Lead Ammunition Ban in Nod to Hunters*, REUTERS (Mar. 2, 2017, 5:58 PM), <https://www.reuters.com/article/us-usa-interior-zinke/new-interior-head-lifts-lead-ammunition-ban-in-nod-to-hunters-idUSKBN16930Z> (mentioning extent of DOI authority over U.S. land).

68. *About the U.S. Fish and Wildlife Service*, U.S. FISH & WILDLIFE SERV., https://www.fws.gov/help/about_us.html (Jan. 21, 2021) (describing FWS’s function).

69. *See* Golden, Warner & Coffey, *supra* note 6, at 126 (stating reports of lead poisoning date back to 1894 in Texas and North Carolina); Migratory Bird Hunting; Criteria and Schedule for Implementing Nontoxic Shot Zones for 1987-88 and Subsequent Waterfowl Hunting Seasons, 51 Fed. Reg. 23,444, 23,444 (June 27, 1986) (to be codified at 50 C.F.R. pt. 20) (proposing rule banning lead ammunition for waterfowl hunting).

70. Nelson Bryant, *Outdoors; Lead-Shot Battle is Intensified*, N.Y. TIMES (Feb. 23, 1986), <https://www.nytimes.com/1986/02/23/sports/outdoors-lead-shot-battle-is-intensified.html> (citing statistics to lay out scope of lead poisoning in waterfowl).

71. *See* 50 C.F.R. § 20.108 (2020) (establishing ban on ducks, coots, and “certain other species”). “Certain other species” includes animals that hunters may kill along with waterfowl. *Id.* (defining “certain other species”).

72. *Service Continues to Expand Non-Toxic Shot Options as Study Shows Ban on Lead Shot Saves Millions of Waterfowl*, U.S. FISH & WILDLIFE SERV. (Oct. 18, 2000), <https://>

Other animals not covered under the waterfowl lead ban, including upland birds and mammals, continue to suffer lead-related deaths.⁷³ Deer hunters often leave internal organs and tissues at the kill site — a so-called “gut-pile” — which allows the hunter to transport the animal more easily.⁷⁴ Scavengers, like eagles, then consume the lead-laden organs, resulting in severe lead poisoning or death.⁷⁵

C. The Environmental Protection Agency and the Toxic Substances Control Act

The TSCA grants the EPA the authority to regulate “chemical substances” that “present an unreasonable risk of injury to health or the environment.”⁷⁶ Under section 21 of the TSCA, an individual can petition the EPA to initiate a proceeding for a rulemaking.⁷⁷ In 2012, over one hundred organizations petitioned the EPA to regulate the lead in ammunition under the TSCA.⁷⁸

The EPA previously denied a 2010 petition to regulate the lead in bullets, sinkers, and fishing gear, claiming the Agency did not have the authority to regulate ammunition or firearms under the TSCA.⁷⁹ The TSCA excludes from the definition of “chemical sub-

www.fws.gov/news/ShowNews.cfm?ID=A11C3D76-AC20-11D4-A179009027B6B5D3 (noting benefits of lead ammunition ban for waterfowl).

73. See Rachel Hawkins, Comment, *EPA Shoots Down Lead Shot Regulation: Lead Ammo’s Unreasonable Risk to Human Health and the Environment, and the Special Situation of the California Condor*, 5 GOLDEN GATE U. ENV’T L.J. 533, 540 (2012) (observing waterfowl ban does not help other animals).

74. Golden, Warner & Coffey, *supra* note 6, at 135 (describing hunters’ methods after killing large animals).

75. See *id.* (outlining process through which scavenger birds ingest lead). Lead ammunition can cause primary or secondary lead poisoning. *2009 Petition to DOI*, *supra* note 27, at 12 (explaining two ways lead ammunition is toxic to animals). “Primary poisoning occurs when the animal consumes the ammunition,” whereas secondary poisoning occurs when an animal ingests the lead in carrion accidentally. *Id.* (clarifying difference between primary and secondary poisoning).

76. See 15 U.S.C. § 2601(b)(2) (2018) (explaining EPA’s authority to regulate substances).

77. 15 U.S.C. § 2620 (2018) (allowing petitions to EPA).

78. See Ctr. for Biological Diversity et al., *Petition to the Environmental Protection Agency to Regulate Lead Bullets and Shot Under the Toxic Substances Control Act*, U.S. ENV’T PROT. AGENCY 1, 2 (Mar. 2012) [hereinafter *2012 Petition to EPA*], https://www.epa.gov/sites/production/files/2015-10/documents/tsca_ammunition_petition_3-13-12.pdf (requesting EPA regulate lead in ammunition).

79. See Ctr. for Biological Diversity et al., *Petition to the Environmental Protection Agency to Ban Lead Shot, Bullets, and Fishing Sinkers Under the Toxic Substances Control Act*, U.S. ENV’T PROT. AGENCY 1, 7 (Aug. 3, 2010) [hereinafter *2010 Petition to EPA*], https://www.biologicaldiversity.org/campaigns/get_the_lead_out/pdfs/Final_TS_CA_lead_ban_petition_8-3-10.pdf (petitioning EPA to implement ban on lead ammunition); see also *Lead in Ammunition and Fishing Sinkers*, 75 Fed. Reg. 58,377,

stance” sales that are subject to tax under section 4181 of the Internal Revenue Code, which includes shells and cartridges.⁸⁰ In addition to firearms and ammunition, the EPA determined the TSCA exempts seven other types of materials from EPA regulation: “pesticides, tobacco, specified nuclear material . . . food, food additives, drugs, and cosmetics.”⁸¹ Due to the TSCA exemptions, the 2012 petition urged the EPA to regulate the toxic lead inside the ammunition, not the ammunition itself.⁸²

The 2012 petition relied on the legislative history of the TSCA and an Internal Revenue Service (IRS) ruling in determining the EPA possessed the authority to regulate the lead in ammunition.⁸³ A 1968 IRS ruling states, “[T]he tax imposed upon sales of shells and cartridges by section 4181 . . . does not apply to sales of separate parts of ammunition such as . . . bullets[] and powder.”⁸⁴ Accordingly, supporters of the petition reasoned that the lead in bullets is not included in the TSCA’s exclusions to the term “chemical substance”; thus, the EPA had the authority to regulate the lead in ammunition.⁸⁵

The TSCA’s legislative history reinforces this conclusion.⁸⁶ The House of Representatives report for the TSCA states, “Although the language of the bill is clear on its face as to the exemption for pistols, revolvers, firearms, shells, and cartridges . . . the Committee does not exclude from regulation under the bill chemical components of ammunition.”⁸⁷ Similarly, the Senate report notes “chemical substance” does not include “firearms and ammu-

58,377 (EPA Sept. 24, 2010) (disposition of TSCA § 211 Petition) (denying 2010 petition for lack of statutory authority).

80. See 15 U.S.C. § 2602(2)(B)(v) (2018) (excluding sales subject to tax under 26 U.S.C. § 4181 (2018)); 26 U.S.C. § 4181 (imposing tax on shells and cartridges).

81. *Toxic Substances Control Act (TSCA) and Federal Facilities*, U.S. ENV’T PROT. AGENCY, <https://www.epa.gov/enforcement/toxic-substances-control-act-tsca-and-federal-facilities> (last visited Dec. 24, 2020) (listing chemical substances and materials exempt from EPA regulation under TSCA).

82. See *2012 Petition to EPA*, *supra* note 78, at 3 (advocating for EPA regulation of lead ammunition).

83. *Id.* at 55 (supporting EPA’s authority to regulate lead ammunition).

84. Rev. Rul. 68-463, 1968-2 C.B. 507 (stating section 4181 of Internal Revenue Code does not include bullets and powder); 26 U.S.C. § 4181 (imposing tax on cartridges and shells).

85. See *2012 Petition to EPA*, *supra* note 78, at 55 (asserting lead in ammunition falls within “chemical substance” in TSCA).

86. See *id.* at 56 (arguing legislative history supports contention that EPA has authority to regulate lead ammunition).

87. H.R. REP. NO. 94-1341, at 9 (July 14, 1976) (clarifying TSCA’s definition of “chemical substance” includes ammunition components).

inition (to the extent subject to taxes imposed under section 4181 of the Internal Revenue Code).”⁸⁸

The EPA nevertheless denied the 2012 petition for lack of authority under the TSCA to regulate ammunition.⁸⁹ Trumpeter Swan Society, one of the organizations behind the 2012 petition, subsequently filed suit against the Agency.⁹⁰ The D.C. Circuit agreed with the EPA and found the Agency did not have the statutory authority to regulate the lead in ammunition.⁹¹ Although the 2012 petition urged the EPA to regulate the lead components inside of ammunition, the D.C. Circuit focused on the petition’s mention of spent lead ammunition and its effect on wildlife and humans; the court thus concluded the petition instead sought regulation of spent ammunition.⁹² Because a shooter can only spend a bullet after it is “contained in a cartridge or shell,” the EPA could not regulate the spent ammunition without also regulating the prohibited “shells and cartridges” in section 4181 of the Internal Revenue Code.⁹³ Accordingly, the D.C. Circuit affirmed the district court’s dismissal of the complaint.⁹⁴

In 2015, President Obama signed the National Defense Authorization Act for Fiscal Year 2016 (NDAA) into law, which the NRA supported.⁹⁵ Although the law aimed to provide funds for the

88. S. REP. NO. 94-698, at 14 (Mar. 19, 1976) (explaining Internal Revenue Code section 4181 limits exclusion of ammunition from term “chemical substance”).

89. Letter from James Jones, Acting Assistant Admi’r for U.S. EPA, to Jeff Miller, Ctr. for Biological Diversity (Apr. 9, 2012) [hereinafter Letter from James Jones], <http://michellawyers.com/wp-content/uploads/2010/12/4.9.12-EPA-response-to-CBD’s-second-Petition.pdf> (declaring petition not “cognizable”).

90. *See Trumpeter Swan Soc’y v. EPA*, 774 F.3d 1037, 1038 (D.C. Cir. 2014) (summarizing district court proceedings). The EPA denied the 2012 petition in a letter, stating it was substantially similar to the 2010 petition and, as such, did not constitute a new, cognizable petition. *See* Letter from James Jones, *supra* note 89 (declaring 2012 petition not cognizable). Because the 2012 petition did not constitute a “cognizable” petition, the EPA’s denial of the petition was not subject to judicial review. *See Trumpeter Swan Soc’y*, 774 F.3d at 1041 (explaining problem with EPA’s reasoning). The district court nevertheless found the term was ambiguous, deferred to the EPA’s interpretation, and dismissed the complaint. *Id.* at 1040 (stating district court’s findings). The D.C. Circuit disagreed, finding the EPA cannot declare a petition that meets the statutory requirements “not cognizable.” *Id.* at 1041 (explaining circuit court’s holding).

91. *See Trumpeter Swan Soc’y*, 774 F.3d at 1043 (finding EPA cannot implement ban on lead ammunition).

92. *Id.* at 1042 (concentrating on spent ammunition).

93. *Id.* (finding EPA cannot regulate lead ammunition).

94. *See id.* at 1044 (affirming lower court’s dismissal).

95. National Defense Authorization Act for Fiscal Year 2016, Pub. L. No. 114-92, 129 Stat. 726, 791 (2015) (funding U.S. military); *see President Obama Signs NRA-Backed Measures into Law*, NAT’L RIFLE ASS’N (Nov. 27, 2015), <https://www.>

U.S. military, it also contained a provision to exclude shot shells and cartridges, as well as their components, from the term “chemical substance” in the TSCA.⁹⁶ This addition to the statute prevents the EPA from regulating the lead in ammunition under the TSCA, but it does not preclude other agencies or Congress from exercising their authority to implement a ban on lead ammunition.⁹⁷

IV. NOT BY A LONG SHOT: THE PRESENT STATE OF LEAD AMMUNITION REGULATIONS

Federal agencies, Congress, and states have attempted to restrict the use of lead ammunition for hunting.⁹⁸ In the absence of legislative or regulatory restrictions on lead ammunition, some states implemented educational programs to encourage and incentivize the voluntary use of non-lead alternatives.⁹⁹ Nonetheless, these restrictions and programs have failed to provide a comprehensive framework of protection for wildlife and the environment.¹⁰⁰

A. Federal Agencies and the Administrative Procedure Act

The day before President Trump’s inauguration on January 20, 2017, then-Director of the FWS, Dan Ashe, issued FWS Director’s Order 219 (Order 219).¹⁰¹ Recognizing lead’s harmful effects on species not covered by the 1991 regulation for waterfowl hunting, Order 219 banned all lead ammunition from “Service lands, waters, and facilities.”¹⁰² The Order provided that the ban would not be fully effective until 2022, allowing the FWS to work with states, wildlife associations, and tribes to facilitate the ban’s implementa-

nraaila.org/articles/20151127/president-obama-signs-nra-backed-measures-into-law (explaining how NDAA supports NRA’s policy goals).

96. See 15 U.S.C. § 2602(2)(B)(v) (amending TSCA’s language).

97. See *id.* (limiting only EPA regulation under TSCA); see also David Kopel, *President Obama Signs Three Constructive Gun Measures*, WASH. POST (Dec. 10, 2015), <https://www.washingtonpost.com/news/volokh-conspiracy/wp/2015/12/10/president-obama-signs-three-constructive-gun-measures/> (noting potential alternative avenues for regulating lead ammunition).

98. For a discussion of the federal and state attempts to regulate use of lead ammunition for hunting, see *infra* notes 101-77 and accompanying text.

99. For a discussion of programs encouraging the voluntary use of non-lead ammunition, see *infra* notes 146-67 and accompanying text.

100. For a discussion of the limited wildlife protections that the regulatory and voluntary use of non-lead ammunition affords, see *infra* notes 162-64 and accompanying text.

101. See FISH & WILDLIFE SERV., DIRECTOR’S ORDER 219: USE OF NONTOXIC AMMUNITION AND FISHING TACKLE (Jan. 19, 2017) [hereinafter ORDER 219] (expanding use of non-toxic ammunition and fishing tackle).

102. *Id.* (noting 1991 lead ammunition ban only benefits waterfowl).

tion.¹⁰³ Order 219 also specified that it would remain in effect until the FWS incorporated it into the Service Manual or revoked it.¹⁰⁴

FWS Director's Orders are limited to: "(1) Temporary policy and procedures, (2) Delegations of authority, (3) Emergency policy, (4) Special assignments or functions, and (5) Initial statements establishing new organizational units or transferring functions."¹⁰⁵ This is consistent with the scope of the Administrative Procedure Act (APA), which controls how administrative agencies promulgate rules and regulations.¹⁰⁶ The APA allows agencies to deviate from the prescribed rulemaking process for "interpretive rules, general statements of policy, . . . rules of agency organization, procedure, or practice" and when public input would be "impracticable."¹⁰⁷

Courts and Congress have criticized agencies for failing to follow the APA's prescribed rulemaking process by issuing rules that are not merely interpretive or internal, but instead "establish new policy decisions that the agency treats as binding."¹⁰⁸ A rule is "binding" if it reasonably leads "affected private parties . . . to believe that failure to conform will bring adverse consequences," contains "mandatory language," or includes terms demonstrating it

103. *Id.* (explaining FWS's two-year delay of ban).

104. *See id.* (describing when Order is effective). The FWS uses the Service Manual "to establish long-lasting policy and procedures." *Preparation and Issuance of Director's Orders*, U.S. FISH & WILDLIFE SERV. (June 4, 2020), <https://www.fws.gov/policy/012fw1.html> (specifying function of FWS Service Manual).

105. *Preparation and Issuance of Director's Orders*, *supra* note 104 (explaining purpose and scope of FWS Director's Orders).

106. Jill Nylander, *The Administrative Procedure Act*, 85 MICH. B.J. 39, 39 (2006) (describing APA's purpose).

107. 5 U.S.C. § 553(b) (2018) (specifying circumstances under which agencies may deviate from rulemaking process). The rulemaking process entails first publishing a proposed rule in the Federal Register, which includes a description of the rule and its source of legal authority, to allow the opportunity for public comment. *Id.* § 553(b)-(c) (outlining APA's rulemaking process). After the comment period closes, the proposing agency issues a final rule in the Federal Register responding to issues the public comments raised. *Id.* § 553(c) (specifying next steps after notice-and-comment period). The final rule is then codified in the Code of Federal Regulations (CFR). Nylander, *supra* note 106, at 39 (explaining APA's rulemaking requirements).

108. Agency Good Guidance Practices, 72 Fed. Reg. 3,432, 3,433 (Off. of Mgmt. & Budget, Exec. Off. of the President Jan. 25, 2007) (final bulletin) (describing how agencies circumvent APA requirements and establishing practices for agency guidance documents); *Appalachian Power Co. v. EPA*, 208 F.3d 1015, 1020 (D.C. Cir. 2000) (noting phenomenon of agencies contravening APA's rulemaking procedures); *General Elec. Co. v. EPA*, 290 F.3d 377, 385 (D.C. Cir. 2002) (vacating EPA rule because Agency did not adhere to statutorily prescribed rulemaking procedures); H.R. REP. NO. 106-1009, at 1 (2000) (finding agencies conduct "backdoor regulation" by bypassing APA's rulemaking process).

“will be regularly applied.”¹⁰⁹ Accordingly, if an agency establishes “a change in substantive law or policy . . . administer[ed] with binding effect,” it cannot rely on the APA’s policy statement exemption and must instead abide by prescribed rulemaking procedures.¹¹⁰ In effect, the APA offers members of the public the opportunity to consider, review, and critique an agency’s proposed rule before it becomes binding.¹¹¹

The FWS Director issued Order 219 without adhering to the APA’s rulemaking process.¹¹² Order 219’s explanation that it was FWS policy to require the use of non-toxic ammunition on Service land by 2022 appears to indicate that the Order was not binding; however, the Order also stated it was to take effect immediately, demonstrating its binding impact on the public.¹¹³ Notably, the FWS followed the APA’s rulemaking process in 2010 when it required the use of non-lead ammunition for the depredation hunting of migratory birds.¹¹⁴

In March of 2017, the Trump Administration’s new Secretary of the Interior, Ryan Zinke, revoked Order 219 on his first day in the position.¹¹⁵ Secretarial Order No. 3346 repealed Order 219 be-

109. Robert A. Anthony, *Interpretive Rules, Policy Statements, Guidances, Manuals, and the Like—Should Federal Agencies Use Them to Bind the Public?*, 41 DUKE L.J. 1311, 1328-29 (1992) (defining binding rules).

110. *Id.* at 1355 (summarizing when agencies must follow APA’s rulemaking process).

111. See 5 U.S.C. § 553(c) (providing for public input on administrative regulations); see also Anthony, *supra* note 109, at 1314 n.7 (explaining APA’s notice-and-comment requirements).

112. See ORDER 219, *supra* note 101 (stating Order is effective immediately despite failing to follow APA requirements); see also 5 U.S.C. § 553(b)-(c) (prescribing APA’s rulemaking procedures).

113. See ORDER 219, *supra* note 101 (explaining FWS’s policy and effective date of Order 219).

114. See Migratory Bird Permits; Removal of Rusty Blackbird and Tamaulipas (Mexican) Crow From the Depredation Order for Blackbirds, Cowbirds, Grackles, Crows, and Magpies, and Other Changes to the Order, 75 Fed. Reg. 75,153, 75,153 (Dec. 2, 2010) (to be codified at 50 C.F.R. pt. 21) (requiring non-toxic ammunition for hunting migratory birds). The regulation states that hunters must use non-toxic shot or bullets for the depredation hunting of migratory birds without a permit. 50 C.F.R. § 21.43(d) (2020) (requiring hunters use non-toxic ammunition). Migratory birds include blackbirds, cowbirds, crows, grackles, and magpies. *Id.* (listing species covered).

115. See DEP’T OF INTERIOR, SECRETARIAL ORDER NO. 3346: REVOCATION OF THE UNITED STATES FISH AND WILDLIFE SERVICE DIRECTOR’S ORDER NO. 219 (USE OF NONTOXIC AMMUNITION AND FISHING TACKLE) (Mar. 2, 2017) [hereinafter SECRETARIAL ORDER 3346], <https://www.doi.gov/sites/doi.gov/files/elips/documents/3346%20-%20Revocation%20of%20the%20Unites%20States%20Fish%20and%20Wildlife%20Service%20Director%27s%20Order%20No.%202019%20%28Use%20of%20Nontoxic%20Ammunition%20and%20Fishing%20Tackle%29.pdf> (revoking Order 219). The National Shooting Sports Foundation, echoing the NRA’s

cause (1) it was not mandated by existing law, and (2) the FWS implemented it “without significant communication, consultation, or coordination with affected stakeholders.”¹¹⁶ Although the Secretarial Order did not define “affected stakeholders,” this term may include the public, wildlife associations, sportspersons, ammunition manufacturers, and policymakers.¹¹⁷

In 2009, the National Park Service (NPS) announced its aim to eliminate the use of lead ammunition on federal land by 2010 and, like the FWS, did so without following the APA’s rulemaking process.¹¹⁸ The NPS’s press release failed to address how the Agency would phase out the use of lead ammunition.¹¹⁹ The statement instead detailed the Agency’s requirement that rangers and resource managers use non-lead ammunition and announced the Agency’s intent to develop public awareness materials on the harmful effects of lead.¹²⁰ After receiving public backlash against the complete ban on lead ammunition, the NPS issued another press release asserting the non-lead ammunition requirement only applied internally to NPS officers and any future lead ban applicable to the public would entail “public involvement, comment, and review.”¹²¹

characterization of lead as “traditional,” approved the revocation of Order 219 because it “preserves the ability of hunters and target shooters to participate in their traditions.” *Secretary Zinke Downs Last-Minute Lead Ban; Preserves Sportsmen’s Ability to Participate in Traditions*, NAT’L SHOOTING SPORTS FOUND. (Mar. 2, 2017), <https://www.nssf.org/secretary-zinke-downs-last-minute-lead-ban-preserves-sportsmens-ability-to-participate-in-traditions/> (supporting Secretarial Order 3346).

116. SECRETARIAL ORDER 3346, *supra* note 115 (justifying revocation of Order 219). The Secretarial Order did not explain why Order 219 was not mandated by law, even though Order 219 cited the following eight statutes as authority for the lead ammunition ban on Service lands: Bald and Golden Eagle Protection Act, 16 U.S.C. §§ 668a-d (2018); Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712 (2018); National Wildlife Refuge System Administration Act of 1966, *amended by* National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. §§ 668dd-668ee (2018); National Wildlife Refuge Recreation Act, 16 U.S.C. §§ 460k-460k-4 (2018); Endangered Species Act (ESA), 16 U.S.C. §§ 1531-1543 (2018); Fish and Wildlife Act 1956, 16 U.S.C. §§ 742a-742j (2018); Migratory Bird Conservation Act, 16 U.S.C. §§ 715-715r (2018); Emergency Wetlands Resources Act of 1986, 16 U.S.C. § 3901b (2018). *See id.* (stating Order 219 was not mandated by law); ORDER 219, *supra* note 101 (listing statutory authority).

117. *See Final Position Statement: Lead in Ammunition and Fishing Tackle*, WILDLIFE SOC’Y (2009), https://wildlife.org/wp-content/uploads/2014/05/PS_LeadinAmmunitionandFishingTackle.pdf (providing wildlife organization’s interpretation of “affected stakeholders”).

118. *See* Press Release, Nat’l Park Serv., National Park Service Gets the Lead Out! (Mar. 10, 2009) (on file with author) (establishing goal to disallow lead ammunition in NPS parks).

119. *See id.* (failing to address phase-out plan for lead ammunition).

120. *Id.* (explaining NPS’s actions to reduce use of lead ammunition).

121. Press Release, Nat’l Park Serv., National Park Service Clarification Statement (Mar. 18, 2009) (on file with author) (clarifying statements in previous press

B. Federal Agencies and Congress

In 2012, the Center for Biological Diversity, Sierra Club, and Grand Canyon Wildlands Council filed suit against the United States Forest Service (USFS), seeking a declaratory judgment that the USFS violated the Resource Conservation and Recovery Act (RCRA) by failing to regulate the use and disposal of lead ammunition on forest floors.¹²² The RCRA governs the disposal of hazardous waste and aims to reduce or eliminate future waste.¹²³ During oral argument, the USFS recognized its authority to ban the use of lead bullets, remove discarded bullets from Forest Service land, and require hunters to do the same.¹²⁴ At the time, however, Congress prevented federal agencies from using federal funds to regulate the lead content of ammunition under “any . . . law.”¹²⁵ This effectively

release); see *Lead Ammo Ban by National Park Service an Anti-Hunting Move*, NAT'L RIFLE ASS'N (Mar. 11, 2009), <https://www.nrila.org/articles/20090311/lead-ammo-ban-by-national-park-service> (stating NPS's lack of notice to sportsperson community was “deliberate attempt” to deter hunting). Although the NPS has not established a requirement that hunters use non-lead ammunition, it has encouraged hunters to maintain the “proud tradition of wildlife conservation” by using non-lead bullets. *Lead Bullet Risks*, NAT'L PARK SERV., https://www.nps.gov/redw/learn/nature/lead_bullets.htm (Aug. 21, 2020) (discouraging hunters from using lead bullets).

122. See *Ctr. for Biological Diversity v. U.S. Forest Serv.*, No. CV-12-8176-PCT-SMM, 2013 U.S. Dist. LEXIS 92771, at *3-4 (D. Ariz. July 1, 2013) (explaining purpose behind lawsuit). The statute provides that any person can commence a civil action under the RCRA against any governmental agency that allegedly violates the RCRA. 42 U.S.C. § 6972 (2018) (establishing mechanism by which individuals can commence civil action under RCRA). To state a claim under the RCRA, the plaintiff must establish the defendant “has contributed or . . . is contributing to the past or present handling . . . or disposal of any solid or hazardous waste.” *Id.* § 6972(a)(1)(B) (requiring claimant establish defendant contributed to RCRA violation). The district court dismissed the case twice, the first time for lack of standing and the second time on justiciability grounds. See *Ctr. for Biological Diversity v. U.S. Forest Serv.*, 925 F.3d 1041, 1046-47 (9th Cir. 2019) (summarizing prior case history). The United States Court of Appeals for the Ninth Circuit reversed the district court's dismissal and remanded for consideration of the merits of the case. *Id.* at 1053 (reversing and remanding district court's decision).

123. 42 U.S.C. § 6902 (2018) (stating objectives and national policy behind RCRA).

124. *Ctr. for Biological Diversity*, 925 F.3d at 1045 n.1 (explaining USFS stated it had authority to regulate lead ammunition on Forest Service land); see also 36 C.F.R. § 261.70(a)(4) (2020) (noting USFS can issue regulations to protect threatened or endangered animals).

125. See Consolidated Appropriations Act, 2019, Pub. L. No. 116-6, § 418, 133 Stat. 13, 262 (2019) (prohibiting agencies from using federal funds to regulate lead in ammunition); Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, § 418, 132 Stat. 348, 691 (2018) (preventing agencies from using federal funds to impose restrictions on lead ammunition); Consolidated Appropriations Act, 2017, Pub. L. No. 115-31, § 420, 131 Stat. 135, 498-99 (2017) (banning use of federal funds for regulating lead ammunition); Consolidated Appropriations Act, 2016, Pub. L. No. 114-113, § 420, 129 Stat. 2242, 2579 (2016) (precluding agencies from

precluded any federal agency from successfully requiring hunters to use non-lead ammunition.¹²⁶

Instead, Congress could support restrictions on lead ammunition for hunting.¹²⁷ In July of 2020, Representative Ted Lieu of California introduced the Lead Endangers Animals Daily Act (LEAD Act).¹²⁸ The bill required the Secretary of the Interior to implement regulations prohibiting the use of lead ammunition on FWS land.¹²⁹ The prohibition was not applicable to government officials who manage wildlife, law enforcement officers, and active members of the U.S. military.¹³⁰ Violators of the LEAD Act would receive a five hundred-dollar penalty.¹³¹ Despite evidence demonstrating that the reduction of lead is beneficial to the environment, wildlife, and hunters, the bill did not receive a vote before the legislative session ended.¹³²

C. States' Lead Ammunition Legislation

Although no federal ban on lead ammunition exists for hunting, individual states have enacted laws to reduce hunters' use of lead ammunition.¹³³ This patchwork of legislation protects some animal and plant species from the detrimental effects of lead.¹³⁴

devoting federal funds towards regulating lead ammunition); Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. No. 113-235, § 425, 128 Stat. 2130, 2450 (2015) (using same language from Consolidated Appropriations Acts 2016-2018 to prevent restrictions on lead ammunition). As a result, the USFS could not regulate lead ammunition between 2010 and 2014 due to funding challenges. *See Ctr. for Biological Diversity*, 925 F.3d at 1045 n.1 (noting USFS's inability to regulate use of lead ammunition on Forest Service land).

126. *See* Consolidated Appropriations Act, 2019 § 418 (regulating agencies' use of federal funds).

127. *See* LEAD Act of 2020, H.R. 7547, 116th Cong. (2020) (banning lead ammunition on federal land).

128. *Id.* (introducing LEAD Act on July 9, 2020).

129. *See id.* § 3(a) (requiring DOI secretary to ban lead ammunition).

130. *See id.* § 3(c) (stating exceptions to proposed lead ammunition prohibition).

131. *See id.* § 3(d) (discussing penalty for violating proposed lead ban). Although first-time violators pay a five hundred-dollar penalty, this penalty increases to between one thousand and five thousand dollars with subsequent violations. *Id.* (explaining fines increase with subsequent violations).

132. *See* H.R. 7547, § 2 (noting lead poses threat to wildlife and humans); *H.R. 7547 (116th): LEAD Act of 2020*, GovTRACK, <https://www.govtrack.us/congress/bills/116/hr7547> (last visited Jan. 31, 2021) (indicating bill did not receive vote).

133. *See* Andy McGlashen, *If Lead Ammunition Is Bad For People and the Environment, Why Do We Still Use It?*, MEDIUM (Apr. 14, 2018), <https://medium.com/ensia/if-lead-ammunition-is-bad-for-people-and-the-environment-why-do-we-still-use-it-9d3baefcabb9> (describing state regulation of lead ammunition).

134. *See id.* (summarizing benefits of state lead regulations).

The state regulations fall roughly within three categories: (1) a complete ban on the use of lead ammunition for all hunting, (2) a ban on lead ammunition for hunting certain animals or in particular areas, and (3) no further regulation past the federal ban for waterfowl.¹³⁵

135. See *id.* (outlining specific state lead ammunition regulations). The majority of states limit lead ammunition regulations to the federal waterfowl ban. See ALA. ADMIN. CODE r. 220-2-.02(4) (2020) (banning lead shot for waterfowl); *Arizona Waterfowl and Snipe Regulations*, ARIZ. GAME & FISH DEP'T 1, 3 (2020), https://azgfd-portal-wordpress-pantheon.s3.us-west-2.amazonaws.com/wp-content/uploads/archive/2020-21-Waterfowl-and-Snipe-Regulations_amended-201006.pdf (requiring non-toxic shot for “ducks, geese (including brant), or coots”); COLO. CODE REGS. § 406-5(502)(B) (2021) (requiring non-toxic shot for waterfowl); CONN. AGENCIES RECS. § 26-66-4(q)(1) (2021) (stating hunters must use non-toxic shot for “waterfowl, coot[s], and rail[s]”); 7-3000-3900 DEL. ADMIN. CODE § 3.3.1 (2021) (obligating hunters to use non-toxic ammunition for “waterfowl, rails, snipe, and moorhens”); FLA. ADMIN. CODE ANN. r. 68A-16.001(2) (2021) (adopting federal regulation banning use of lead ammunition for waterfowl); GA. COMP. R. & REGS. 391-4-2.40(3) (2020) (barring use and possession of lead shot when hunting ducks or geese); HAW. CODE R. § 13-122-12(b) (LexisNexis 2021) (applying firearm restrictions for hunting that do not include restrictions on lead ammunition); IDAHO ADMIN. CODE r. 13.01.09.301(1) (2021) (banning non-toxic shot for waterfowl); IOWA ADMIN. CODE r. 571-92.3(3) (2021) (providing hunters can only possess non-toxic shot while hunting “brant, wild ducks, geese, rails, coots, and snipe”); KAN. ADMIN. REGS. § 115-18-14(b) (2021) (noting hunters must use non-toxic shot for “waterfowl, coot, rail, snipe, and sandhill crane”); 301 KY. ADMIN. REGS. 222(2)(2)(a) (2021) (banning waterfowl hunters’ use or possession of shotgun shells containing lead shot); 09-137-016 ME. CODE R. § 16.11(14)(A) (2021) (stating hunters must use non-toxic shot for “wild ducks, geese, brant, rails, and American coots”); 321 MASS. CODE REGS. 3.02(2)(e)(7) (2021) (designating Massachusetts as non-toxic shot zone for waterfowl or coots); *Lead Poisoning*, MICHIGAN.GOV, https://www.michigan.gov/dnr/0,4570,7-350-79136_79608_85016-26676-,00.html#:~:text=Michigan%2C%20as%20well%20as%20all,the%20use%20of%20lead%20bullets (last visited Feb. 9, 2021) (stating Michigan requires use of non-toxic shot for waterfowl hunting); 40-2 MISS. CODE R. § 1.38 (LexisNexis 2021) (stating only non-toxic shot can be used to hunt waterfowl in certain areas); MONT. CODE ANN. § 87-3-403 (2020) (stating DOI and FWS regulations proscribe migratory bird hunting with lead shot); 163 NEB. ADMIN. CODE § 163-4(11) (2021) (adhering to federal FWS regulations for waterfowl); N.H. CODE ADMIN. R. ANN. Fish & Game Dep’t 302.04(g) (2021) (requiring non-toxic shot for “taking of ducks and mergansers”); N.Y. COMP. CODES R. & REGS. tit. 6, § 90.2(c) (2021) (prohibiting use of lead shot for waterfowl hunters); N.D. ADMIN. CODE 30-02-03-11 (2021) (stating waterfowl hunting must conform to federal regulations); S.C. CODE ANN. § 123-40-10.16 (2020) (providing hunters must use non-toxic shells on Waterfowl Management Areas); *Legal Hunting Equipment & Methods*, TENN. WILDLIFE RES. AGENCY, <https://www.tn.gov/twra/hunting/equipment-methods.html> (last visited Feb. 10, 2021) (prohibiting use of non-toxic shot for “waterfowl, coots, gallinules, Virginia rails, and sora rails”); 31 TEX. ADMIN. CODE § 65.310(11) (2021) (preventing possession of all shot except non-toxic shot while hunting waterfowl); 16-4 VT. CODE R. § 142:1(b) (2021) (stating hunters cannot possess toxic shot while hunting combination of waterfowl, coots, and other species); 4 VA. ADMIN. CODE § 15-260-140 (2021) (providing it is unlawful to use toxic shot to hunt “ducks, geese, brant, swans, coots, mergansers, rails, snipe, gallinules, or moorhens”); W. VA. CODE R. § 58-58-3.8 (2021) (stating hunters must use non-toxic shot for waterfowl). California is the only state that imposes a lead ammunition ban for all hunt-

1. *Category One: California's Complete Ban on Lead Ammunition for Hunting Purposes*

In 2013, California became the first state to require that hunters use non-lead ammunition for all firearms.¹³⁶ In 2007, California banned lead ammunition in condor ranges in an effort to protect the declining condor population.¹³⁷ Although the 2007 ban helped reduce condors' exposure to lead, it was ineffective in

ing. See CAL. CODE REGS. tit. 14, § 250.1(a) (2021) (banning use of lead ammunition for all hunting). The remainder of the states expand upon the federal ban for waterfowl to include other animals or to cover certain protected areas. See ALASKA ADMIN. CODE tit. 5, § 92.080(13) (2020) (requiring non-toxic shot for upland game birds in certain areas); 002-00-001 ARK. CODE R. § 23.05 (LexisNexis 2020) (stating it is unlawful to hunt small game with lead ammunition in certain areas); ILL. ADMIN. CODE tit. 17, § 690.30(d), (i) (2021) (establishing areas where hunters must use non-toxic shot); 312 IND. ADMIN. CODE 8-2-3(k) (2021) (prohibiting hunters from possessing lead shot while hunting mourning doves in certain areas); LA. ADMIN. CODE tit. 76, § 111(c)(3) (2021) (requiring non-toxic shot for nutria, an invasive rodent); MD. CODE REGS. 08.03.07.06(A) (2021) (providing hunters must use non-toxic shot for wetland game birds); MINN. R. 6230.0200(13) (2021) (forbidding use or possession of lead shot for hunting doves on managed dove fields); MO. CODE REGS. ANN. tit. 3, § 10-11.180(8) (2021) (prohibiting use or possession of lead shot in certain areas); NEV. ADMIN. CODE § 503.187(2) (2020) (requiring use of non-toxic shot when hunting wild turkey in wildlife management area); N.J. ADMIN. CODE § 7:25-5.13(c), (l)(15) (2021) (specifying hunters must use non-toxic shot for "waterfowl, woodcock, mourning doves, rails, gallinules, and light geese"); N.M. CODE R. § 19.31.5.9(H)(3) (2021) (requiring non-toxic shot on all state game commission-owned lands); 15a N.C. ADMIN. CODE 10B.0114(i)(2) (2021) (mandating non-toxic shot for training dogs with waterfowl); OHIO ADMIN. CODE 1501:31-7-02(E) (2021) (making it unlawful to use toxic lead shot in certain areas); OKLA. ADMIN. CODE § 800:25-1-7 (2021) (specifying hunters must use non-toxic shot in certain areas while hunting doves and rabbits); OR. ADMIN. R. 635-008-0190(9) (2021) (establishing hunters must use non-toxic shot in certain areas "except for big game hunters using buckshot or slugs"); 58 PA. CODE § 135.107(a)(6) (2021) (mandating non-toxic shot for hunting small game and waterfowl in particular areas); 250-60 R.I. CODE R. § 9.16(N)(10)(a) (LexisNexis 2021) (banning possession of lead shot for killing doves while hunting geese in specific areas); S.D. ADMIN. R. 41:06:04:05.01 (2021) (requiring non-toxic shot for hunting small game in particular areas); UTAH ADMIN. CODE r. 657-9-8(2) (LexisNexis 2021) (specifying areas where hunters cannot use lead shot); WASH. ADMIN. CODE § 220-414-040(4) (2021) (establishing it is unlawful to use toxic shot for "upland game birds[,] . . . mourning doves, and band-tailed pigeons"); WIS. ADMIN. CODE Nat. Res. § 10-09(2)(d)(1) (2021) (banning use of non-toxic shot when hunting "waterfowl, mourning doves, snipe, rails, moorhens, or coot" on lands under management of department); 40-14 WYO. CODE R. § 2(e) (LexisNexis 2020) (requiring use of non-toxic shot when hunting any game bird in specified wildlife habitat management areas).

136. CAL. CODE REGS. tit. 14, § 250.1(a) (2021) (banning use of lead ammunition for all hunting).

137. See Ravindran, *supra* note 49 (describing benefits of lead ammunition ban for condor ranges). In 1982, the total condor population was only twenty-two. Tim Stephens, *Lead Poisoning Blocks Recovery of California Condor Population*, UC SANTA CRUZ (June 25, 2012), <https://news.ucsc.edu/2012/06/condors-and-lead.html> (providing statistics on condor population). Although a captive breeding program allowed the condor population to grow, around half of all "free-flying"

protecting the species.¹³⁸ Condors often travel outside their protected ranges, where they consume the spent lead hunters leave behind in carcasses.¹³⁹ One study found that over the span of ten years, if less than one percent of carcasses are contaminated with lead, a condor has an eighty-five to ninety-eight percent chance of becoming lethally exposed to it.¹⁴⁰ Condors are not the only species in California that lead endangers — bald eagles, golden eagles, mountain lions, and bears also suffer from hunters' use of lead ammunition.¹⁴¹

California's 2013 ban on lead ammunition for all hunting served to remedy this problem by reducing the amount of lead that hunters deposit into the environment.¹⁴² To ease the ban's burden on the hunting industry, California phased in the non-lead ammunition requirement, which went into full effect on July 1, 2019.¹⁴³ To discourage people from ignoring the ban, California also imposed a considerable fine for violations.¹⁴⁴

2. *Category Two: States That Expand upon the Waterfowl Ban*

Some states, like Pennsylvania, expand upon the federal waterfowl ban to require non-lead ammunition when hunting in certain areas or for specific species.¹⁴⁵ Pennsylvania prohibits hunters from using lead ammunition to hunt "small game" on the protected Middle Creek Wildlife Management Area.¹⁴⁶ The Pennsylvania Game Commission (PGC) owns and operates the Middle Creek Wildlife

California condors required treatment for lead poisoning between 1997 and 2012. *Id.* (explaining lead continues to impede condor population growth).

138. See Ravindran, *supra* note 49 (noting lead ban on condor ranges does not reduce condors' lead exposure completely).

139. See *id.* (analyzing how geographic bans on lead ammunition do not prevent condors from consuming lead).

140. See Stephens, *supra* note 137 (illustrating lethal effects of lead left behind in carcasses).

141. Ravindran, *supra* note 49 (listing other species lead ammunition adversely affects).

142. See CAL. CODE REGS. tit. 14, § 250.1(a) (prohibiting hunters from using lead ammunition).

143. See *id.* (laying out phased-in approach to full lead ammunition ban).

144. See CAL. FISH & GAME CODE § 3004.5(g) (West 2013) (establishing fine for using lead ammunition). California imposes a five hundred-dollar fine on the first offense and up to a five thousand-dollar fine for subsequent offenses. *Id.* (describing fine for violating ban).

145. See 58 PA. CODE § 135.107(a)(6) (requiring non-toxic shot for certain species in particular areas).

146. See *id.* (stating hunters must use non-toxic shot to hunt small game in protected areas like Middle Creek Wildlife Management Area). "Small game" includes squirrels, ruffed grouses, rabbits, pheasants, bobwhite quails, hares, woodchucks, crows, starlings, and English sparrows. *Seasons and Bag Limits*, PA. GAME

Management Area to ensure the preservation of wildlife on the land.¹⁴⁷

Although Pennsylvania does not ban lead ammunition for all hunting, the PGC began conducting education campaigns in 2017 to warn hunters of lead ammunition's detrimental effects on human health and wildlife.¹⁴⁸ The education campaigns include newsletter articles explaining the effects of lead toxicosis in eagles specifically, as well as YouTube videos describing lead's harmful impact.¹⁴⁹ The purpose of this educational outreach is to encourage hunters to choose non-lead alternatives voluntarily.¹⁵⁰

Other states have also considered implementing educational outreach programs to highlight the benefits of non-lead ammunition.¹⁵¹ For example, in 2014, Oregon conducted a survey to gather information from hunters and the general public about their perceptions surrounding the use of lead ammunition and its impact on wildlife.¹⁵² The survey results indicated that although fifty-one percent of the non-hunting public strongly agreed that "[i]ngestion of lead can be fatal to animals," only twenty percent of

COMM'N (2020), <https://www.pgc.pa.gov/HuntTrap/Law/Pages/SeasonsandBagLimits.aspx> (listing small game species).

147. See *About Us*, PA. GAME COMM'N, <https://www.pgc.pa.gov/InformationResources/AboutUs/Pages/default.aspx> (last visited Feb. 12, 2021) (describing PGC's mission).

148. See Burns, *supra* note 46 (explaining PGC's education campaign). Between 2006 and 2016, thirty percent of the eagles PGC examined contained detectable levels of lead in their liver. See *Bald Eagles and Lead*, PA. GAME COMM'N 1, 2, <https://www.pgc.pa.gov/Wildlife/WildlifeSpecies/BaldEagles/Documents/eagle-lead%20brochure%20web.pdf> (last visited Feb. 12, 2021) (explaining result of PGC's examination of bald eagles). The Communications Director of the PGC, Travis Lau, explained the PGC's preference for educational materials encouraging hunters to use non-lead ammunition, stating hunters have no opposition to the educational information the PGC releases on lead ammunition. Burns, *supra* note 46 (noting hunters are skeptical of information but do not object to it). In contrast, Lau expressed that both the PGC and Pennsylvania legislators were not interested in banning lead ammunition for hunting. *Id.* (comparing support for education campaigns with lack of support for non-lead regulations).

149. See *Bald Eagles and Lead*, *supra* note 148 (outlining lead ammunition's danger to bald eagles); Pa. Game Comm'n, *Webinar: Lead Toxicity in Bald Eagles in Pennsylvania*, YOUTUBE (Oct. 26, 2018), <https://www.youtube.com/watch?v=MVzu3aPCyVk> (discussing lead toxicity in bald eagles).

150. See *Bald Eagles and Lead*, *supra* note 148 (suggesting hunters can help prevent lead poisoning in wildlife by switching to non-lead ammunition).

151. See *Non-Lead Hunting Education*, NON-LEAD EDUC., <https://nonleadeducation.com/> (last visited Feb. 12, 2021) (educating hunters on lead and non-lead ammunition).

152. *Lead Ammunition Survey Summary*, OR. DEP'T OF FISH & WILDLIFE 1, 1 (Jan. 27, 2016), https://www.dfw.state.or.us/wildlife/lead/ODFW_Final_General_Summary_27_Jan_16.pdf (explaining purpose of survey).

hunters strongly agreed with the statement.¹⁵³ Further, almost forty percent of hunters stated under no circumstances would they switch to non-lead ammunition.¹⁵⁴

In addition to educating hunters, states also incentivize the use of non-lead ammunition.¹⁵⁵ Utah's non-lead program, established in 2010, offered hunters a twenty-five-dollar rebate for purchasing non-lead ammunition for use on Utah's Zion Unit.¹⁵⁶ Utah then modified its program in 2020, allowing hunters to receive a coupon for non-lead ammunition worth up to fifty dollars.¹⁵⁷ Hunters can also participate in the "condor prize drawing" by demonstrating to Utah's Division of Wildlife Resources that they are hunting with non-lead ammunition.¹⁵⁸ The winner of the drawing receives five hunting rifles worth a total of eight hundred dollars.¹⁵⁹

Finally, Minnesota urges hunters to use non-lead ammunition voluntarily by hosting shooting clinics.¹⁶⁰ At these clinics, hunters can compare the results of lead and copper bullets.¹⁶¹ The clinic demonstration sets out two rows of water jugs, one for the copper bullets and one for the lead bullets.¹⁶² A participant then shoots through one line of jugs with a copper bullet and the other line

153. *Id.* at 20 (comparing responses of general public and hunters).

154. *See id.* at 8 (showing significant number of hunters refuse to switch to non-lead ammunition).

155. Keith Day, *How to Save a Condor: Hunters Play a Key Role in This Ongoing Effort*, UTAH DIV. OF WILDLIFE RES. (Oct. 7, 2020, 12:00 PM), <https://wildlife.utah.gov/news/wildlife-blog/1048-save-a-condor.html> (describing Utah's efforts to encourage use of non-lead ammunition).

156. *Id.* (outlining Utah's rebate program). Utah based its non-lead program on Arizona's, which offers hunters free non-lead ammunition or rewards them with a prize drawing if they remove lead contaminated gut piles from hunting areas. *Id.* (pointing out similarities between Utah and Arizona's non-lead programs). Utah's rebate applies to people hunting within Utah's Zion Unit, which is private land that is part of the Cooperative Wildlife Management Unit (CWMU) Program. *Cooperative Wildlife Management Units*, UTAH DIV. OF WILDLIFE RES. (Jan. 25, 2021, 3:58 PM), <https://wildlife.utah.gov/cwmu.html> (defining CWMU). This program motivates private landowners to keep their land as a wildlife habitat instead of developing it. *See id.* (explaining CWMU program).

157. *Hunters Helping Condors Program*, UTAH DIV. OF WILDLIFE RES. (July 14, 2021, 9:00 AM), <https://wildlife.utah.gov/hunters-helping-condors.html> (describing changes to non-lead ammunition program).

158. *Id.* (explaining hunters can receive non-lead ammunition coupons).

159. *Id.* (detailing Utah's prize drawing as part of Hunters Helping Condors program).

160. Urbina, *supra* note 56 (discussing state efforts to reduce environmental accumulation of lead).

161. *Id.* (describing Minnesota's shooting clinics).

162. Tori J. McCormick, *In Minnesota, Wildlife Experts Campaign for Copper Bullets*, STARTRIBUNE (Oct. 2, 2014, 3:34 PM), <https://www.startribune.com/in-minnesota-wildlife-experts-campaign-for-copper-bullets/277937621/> (outlining clinic demonstration).

with a lead bullet.¹⁶³ The copper bullet passes through more jugs and remains intact, while the lead bullet turns into fine dust-like particles.¹⁶⁴

This demonstration allows hunters to witness firsthand the different effects of lead and non-lead ammunition and encourages them to make informed decisions.¹⁶⁵ The demonstration's success, however, depends on hunters' willingness to switch to non-lead ammunition voluntarily.¹⁶⁶ Of the five hunters who decided to participate in a clinic, at least two chose to switch to non-lead ammunition.¹⁶⁷

3. *Category Three: States That Limit Lead Ammunition Regulations to the Waterfowl Ban*

The majority of states have not implemented lead ammunition restrictions beyond the requisite regulations for waterfowl.¹⁶⁸ A few states have tried to institute more expansive ammunition regulations.¹⁶⁹ Strong opposition to lead ammunition restrictions, however, continues to prevent the realization of this goal.¹⁷⁰

163. *Id.* (explaining demonstration process).

164. *Id.* (discussing results of demonstration).

165. *Id.* (noting demonstration's purpose is to encourage hunters to choose non-lead ammunition voluntarily).

166. *See id.* (summarizing number of attendees who stated they would switch to non-lead ammunition).

167. McCormick, *supra* note 162 (quantifying demonstration's success in convincing hunters to switch to non-lead ammunition).

168. For an overview of state regulations that limit restrictions on lead ammunition to the federal waterfowl ban, see *supra* note 135.

169. *See* N.Y. Assemb., 703 Legis., 242nd Sess. (N.Y. 2019) (banning lead ammunition on state and federal public lands). Similarly, Minnesota also tried to expand upon its lead ammunition regulations. Greg Stanley, *Minnesota Is Asked to Ban Lead in Ammunition, Fishing Tackle*, STARTRIBUNE (Nov. 4, 2019, 7:23 PM), <https://www.startribune.com/minnesota-is-asked-to-ban-lead-in-ammo-fishing-tackle/562293012/> (summarizing Minnesota's efforts to regulate lead ammunition). In 2015 and 2016, Minnesota's Department of Natural Resources (DNR) proposed banning lead shot on some public land, but public opposition caused DNR to abandon the plan. *See id.* (explaining DNR dropped plans to ban lead shot). The following year, the Minnesota Legislature passed a bill prohibiting the DNR from regulating lead until July 1, 2019. Laura Bies, *Minnesota Rejects Lead Ammunition Ban*, WILDLIFE SOC'Y (Nov. 15, 2019), <https://wildlife.org/minnesota-rejects-lead-ammunition-ban/> (describing legislative response to DNR's proposed rule regulating lead ammunition).

170. *See* NY A00703, BILL TRACK, <https://www.billtrack50.com/BillDetail/1008385> (last visited Jan. 30, 2021) (noting New York bill failed to pass). The NRA rallied opposition to the bill, calling it a "direct attack from animal extremists" bent on destroying hunters' heritage. *New York: Lead Ammunition Ban Another Swipe at New York Gun Owners and Sportsmen*, NAT'L RIFLE ASS'N (Mar. 2, 2020), <https://www.nraila.org/articles/20200302/new-york-lead-ammunition-ban-another-swipe>

In 2019, New York introduced legislation that would prohibit hunters' use of lead ammunition in "wildlife management areas, state forests, forest preserves, state parks, and other state owned land."¹⁷¹ The bill did not pass because it failed to receive a vote.¹⁷² Even without legislative restrictions on lead ammunition, New York's Department of Environmental Conservation continues to encourage hunters to choose non-lead ammunition voluntarily.¹⁷³

Similarly, Vermont introduced a bill in 2015 banning the use of lead ammunition for hunting.¹⁷⁴ The bill's advocates pointed to decades of research demonstrating that lead poses a significant threat to wildlife and humans.¹⁷⁵ The NRA opposed the bill, declaring that the science behind lead poisoning in animals and humans is "faulty" and claiming a non-toxic ammunition requirement would be considerably more expensive for hunters.¹⁷⁶ Nevertheless, like New York, Vermont ultimately failed to pass the bill.¹⁷⁷

V. DODGING THE LEAD BULLET: PROTECTING WILDLIFE AND THE ENVIRONMENT MOVING FORWARD

Although lead poses an undeniable risk to the health of humans, plants, and animals, ninety five percent of the ten to thirteen billion rounds of ammunition that hunters purchase each year contain lead.¹⁷⁸ The FWS calculated hunters deposit an estimated fourteen thousand tons of lead ammunition into the environ-

at-new-york-gun-owners-and-sportsmen (denouncing bill and encouraging New Yorkers' opposition).

171. See N.Y. Assemb., 703 Legis., 242nd Sess. (establishing lead ammunition ban on public land in New York).

172. See NY A00703, *supra* note 170 (noting bill died); see also N.Y. Assemb., 703 Legis., 242nd Sess. (stating bill's effective date if passed was January, 2021).

173. See *Choose Non-Lead Ammunition*, N.Y. DEP'T OF ENV'T CONSERVATION, <https://www.dec.ny.gov/outdoor/48420.html> (last visited Jan. 30, 2021) (advocating for non-lead ammunition).

174. H. 460 § 2(b)(2), 2015 Gen. Assemb., Reg. Sess. (Vt. 2015) (supporting non-toxic ammunition requirement for hunting).

175. Letter from Sarah Walker, Dir., Lead-Free and Fur-Free Campaigns, Humane Soc'y of U.S., to Vt. House Comm. on Fish, Wildlife, & Water Res. (2015) (advocating for lead-free ammunition bill).

176. *Vermont: Multiple Anti-Gun/-Hunting Bills to Be Heard in House Committee Tomorrow*, NAT'L RIFLE ASS'N (Mar. 30, 2015), <https://www.nraila.org/articles/20150330/vermont-multiple-anti-gun-hunting-bills-to-be-heard-in-house-committee-tomorrow> (opposing bill).

177. See H. 460, VT. GEN. ASSEMBLY, <https://legislature.vermont.gov/bill/status/2016/H.460> (last visited Feb. 11, 2021) (noting bill was in committee in March of 2015).

178. See Hawkins, *supra* note 73, at 565 (describing negative impact of lead); see also Urbina, *supra* note 56 (citing statistics on lead ammunition).

ment.¹⁷⁹ This deposited lead poisons around ten to twenty million animals annually including eagles, condors, mourning doves, wild turkeys, and ducks.¹⁸⁰

Moreover, a single lead bullet can pollute around 370 cubic feet of soil.¹⁸¹ Lead-laden soil kills the fungi and bacteria living within it, preventing the recycling of nutrients that plants need to thrive.¹⁸² Additionally, lead inhibits plant growth, impedes photosynthesis, and damages root systems.¹⁸³ A federal lead ammunition ban would help defend, conserve, and preserve plant species across the nation from the toxic effects of lead ammunition.¹⁸⁴

Educational campaigns highlighting the negative effects of lead, as well as additional state restrictions on hunters' use of lead ammunition can shield some wildlife and plant species from lead poisoning.¹⁸⁵ But while these initiatives can help reduce the overall amount of lead hunters expel into the environment, they remain inadequate to protect and save wildlife from lead's negative effects.¹⁸⁶ Lead ammunition restrictions for specific areas or particular species neglect to protect wildlife and plant species outside the scope of these regulations.¹⁸⁷ Furthermore, the current extent to which hunters choose to use non-lead ammunition voluntarily is insufficient to defend wildlife and the environment from toxic lead exposure.¹⁸⁸

179. See Press Release, Ctr. for Biological Diversity, NRA Admits Ignorance of Basic Facts About Lead Ammo's Lethal Toll on Endangered Condors (May 14, 2013), https://www.biologicaldiversity.org/news/press_releases/2013/lead-05-14-2013.html (providing quantity of lead ammunition hunters leave in environment).

180. See Urbina, *supra* note 56 (specifying amount of wildlife deaths each year from lead poisoning); see also Tranel & Kimmel, *supra* note 26, at 320-23 (listing species harmed by lead poisoning).

181. See Hawkins, *supra* note 73, at 552 (noting extent to which one bullet contaminates soil).

182. See *Lead*, *supra* note 29 (explaining lead kills fungi and bacteria).

183. See Farouk S. Nas & Muhammad Ali, *The Effect of Lead on Plants in Terms of Growing and Biochemical Parameters: A Review*, 3 MOJ ECOLOGY & ENV'T SCI. 265, 265 (2018), <http://medcraveonline.com/MOJES/MOJES-03-00098.pdf> (summarizing lead's negative impact on plants).

184. See *Lead*, *supra* note 29 (describing lead's toxic effects on plant species).

185. See *Lead Ammunition Overview*, *supra* note 9 (supporting educational campaigns over legislation to encourage hunters to make ethical decisions). For an analysis of state regulations on lead ammunition, see *supra* notes 133-77 and accompanying text.

186. See McGlashen, *supra* note 133 (analyzing efforts to regulate lead).

187. H. 460 § 1(3), (6), 2015 Gen. Assemb., Reg. Sess. (Vt. 2015) (describing need for complete ban on lead ammunition for hunting). See Golden, Warner & Coffey, *supra* note 6, at 135 (noting discharged lead bullets remain in landscape despite waterfowl ban).

188. See H. 460 § 1(7) (advocating for non-lead ammunition requirements).

Essentially, a federal ban on lead ammunition is necessary to: (1) reduce the amount of toxic lead deposited in the environment, (2) safeguard the health of hunters and their families, and (3) protect wildlife from harmful exposure to lead.¹⁸⁹ California's state-wide ban on lead ammunition, for example, illustrates the positive effects of lead ammunition regulations.¹⁹⁰ As a result of the ban, California decreased the accumulation of lead ammunition in the state, protected over 280,000 hunters from lead poisoning, and promoted the recovery of the critically endangered condor species.¹⁹¹ Federal lead ammunition restrictions would extend the benefits of California's ban throughout the United States, thereby protecting many plant and wildlife species from lead poisoning.¹⁹²

VI. LEAD AMMUNITION BAN IN THE CROSSHAIRS: CONCLUSION

The scientific evidence and data surrounding lead ammunition and lead poisoning demonstrate the need for a federal ban on lead ammunition.¹⁹³ Lead poisoning in hunters, plant species, and wildlife is human-caused and entirely preventable.¹⁹⁴ Despite opposition, Congress must acknowledge lead ammunition's destructive impact on the environment and act to defend the vulnerable wildlife populations under its protection.¹⁹⁵ Rather than prevent agencies from regulating the lead in ammunition, Congress should

189. For a discussion of the negative effects of lead ammunition, see *supra* notes 21-36 and accompanying text.

190. See CAL. CODE REGS. tit. 14, § 250.1(a) (2021) (requiring hunters use non-lead ammunition).

191. See *2020 Hunting*, CAL. DEP'T OF FISH & WILDLIFE (May 31, 2021), <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178041&inline> (noting amount of California hunting licenses in 2020); *California Condor Recovery Program: 2019 Annual Population Status*, U.S. DEP'T OF INTERIOR 1, 5 (2019), https://www.fws.gov/cno/es/calcondor/PDF_files/2020/2019_California_Condor_Population_Status.pdf (depicting increase in condor population).

192. See Hawkins, *supra* note 73, at 562 (arguing national ban on lead ammunition is best means of combatting negative effects of lead ammunition).

193. See *id.* at 566 (calling for national ban on lead ammunition). For a discussion of the scientific evidence and data surrounding lead's impact on wildlife, plant species, and humans, see *supra* notes 21-36 and accompanying text.

194. See Hawkins, *supra* note 73, at 566 (discussing humans' role in poisoning wildlife); see also Jay Strek, *Letter to the Editor: Lead Ammunition Is Bad for Vermont's Environment*, ADDISON COUNTY INDEP. (May 7, 2020, 11:17 AM), <https://addisonindependent.com/opeds/letter-editor-lead-ammunition-bad-vermonts-environment> [<https://web.archive.org/web/20200515102429/https://addisonindependent.com/opeds/letter-editor-lead-ammunition-bad-vermonts-environment>] (stating lead ammunition is preventable threat and advocating for educational campaigns).

195. See McGlashen, *supra* note 133 (noting gun rights advocates have "beaten back" attempts to regulate lead).

instead implement meaningful and comprehensive hunting legislation to ban the use of lead ammunition.¹⁹⁶

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196. *See* LEAD Act of 2020, H.R. 7547, 116th Cong. (2020) (aiming to ban hunters' use of lead ammunition).

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