

October 2022

Silent Spring Revisited – Is it Time to Ban Lead? An Argument for a Federal Ban of the Use of Lead Ammunition for Hunting Game Pursuant to the Endangered Species Act

Jaclyn McBain Cohen

Elisabeth Haub School of Law at Pace University, jmc bain@law.pace.edu

Follow this and additional works at: <https://digitalcommons.pace.edu/pelr>



Part of the [Environmental Law Commons](#), and the [Natural Resources Law Commons](#)

Recommended Citation

Jaclyn McBain Cohen, *Silent Spring Revisited – Is it Time to Ban Lead? An Argument for a Federal Ban of the Use of Lead Ammunition for Hunting Game Pursuant to the Endangered Species Act*, 39 Pace Env'tl. L. Rev. 31 (2022)

DOI: <https://doi.org/10.58948/0738-6206.1855>

Available at: <https://digitalcommons.pace.edu/pelr/vol39/iss1/2>

This Article is brought to you for free and open access by the School of Law at DigitalCommons@Pace. It has been accepted for inclusion in Pace Environmental Law Review by an authorized administrator of DigitalCommons@Pace. For more information, please contact dheller2@law.pace.edu.

NOTE

**SILENT SPRING REVISITED – IS IT TIME TO BAN
LEAD? AN ARGUMENT FOR A FEDERAL BAN OF THE
USE OF LEAD AMMUNITION FOR HUNTING GAME
PURSUANT TO THE ENDANGERED SPECIES ACT**

JACLYN MCBAIN COHEN*

Introduction	32
I. The Impact Of Lead On The Environment And Wildlife .	35
II. Current Regulation Of Lead Ammunition And Lead In Other Substances	38
III. Ability Of USFWS To Promulgate A Rule Under § 9 Of The Endangered Species Act Effectively Banning The Use Of Lead Ammunition Based On The Theory That The Death Or Injury That Results When Wildlife Consumes Spent Lead Ammunition Could Be Considered A “Taking” That Is Unlawful Under This Provision.....	42
IV. Model State Law Highlights The Importance Of A Complete Ban	47
V. Impact Of Lobbyists And Widespread Opposition On Lack Of Effective Regulation For Use Of Lead Ammunition.....	50
VI. Alternatives To Lead Ammunition.....	53
Conclusion.....	54

* J.D. Candidate and Research & Writing Editor, Pace Environmental Law Review, Elisabeth Haub School of Law at Pace University, 2022.

INTRODUCTION

“There was a strange stillness. The birds, for example – where had they gone? Many people spoke of them, puzzled and disturbed. The feeding stations in the backyards were deserted. The few birds seen anywhere were moribund; they trembled violently and could not fly. It was a spring without voices.”¹ Rachel Carson’s call to action influenced the first major wave of environmental lawmaking and led to the prohibition of the sale and use of the highly toxic pesticide Dichlorodiphenyltrichloroethane, (“DDT”). The U.S. Environmental Protection Agency (“EPA”) issued a ban on DDT in 1972 following the exposure of the popular insecticide as a highly toxic substance that negatively impacts the health of humans and wildlife.² Like DDT, lead is a highly toxic substance that serves as a significant threat to the health of the natural environment and the wildlife that lives within it. However, unlike DDT, the federal government has not enacted a ban on its use. The federal government has taken steps to ban the use of lead in paint³ and gasoline,⁴ upon a recognition that the use of lead in those substances has harmful health implications when the lead is discharged into the environment through use of the substance. Yet, the government has continued to allow lead to enter the environment through the largely unregulated practice of using lead-based ammunition for hunting game.⁵ This lack of regulation has concerned many scientists because of the existence of an overwhelming amount of data demonstrating both the toxic nature

¹ RACHEL CARSON, *SILENT SPRING* 2 (Anniversary ed., Houghton Mifflin Co. 2002) (1962).

² *DDT – A Brief History and Status*, EPA, <https://www.epa.gov/ingredients-used-pesticide-products/ddt-brief-history-and-status> [https://perma.cc/J8UP-BKVZ] [hereinafter *DDT Status*]; Press Release, EPA, DDT Ban Takes Effect (Dec. 31, 1972) <https://archive.epa.gov/epa/aboutepa/ddt-ban-takes-effect.html> [https://perma.cc/9RGC-JY8E].

³ 16 C.F.R. § 1303.1(a) (2009).

⁴ *Gasoline Explained*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/energyexplained/gasoline/gasoline-and-the-environment-leaded-gasoline.php#:~:text=Effective%20January%201%2C%201996%2C%20leaded,farm%20equipment%2C%20and%20marine%20engines> [https://perma.cc/9GDT-P56C].

⁵ David C. Bellinger et al., *Health Risks from Lead-Based Ammunition in the Environment*, 121 ENV’T HEALTH PERSP. A 178, A 178 (2013).

of lead and the substantial threat exposure to lead in the natural environment poses to humans and wildlife.⁶

Lead is a highly toxic substance that has a broad physiological impact on organisms.⁷ Once ingested by a living organism, this toxic element can attack various biological systems, including the nervous, immune, and reproductive systems, and ultimately, it can cause the death of the animal.⁸ One way in which lead enters the natural environment is through the use of lead bullets by hunters pursuing game.⁹ When a hunter discharges their firearm, only part of the ammunition lodges into the targeted animal.¹⁰ Spent ammunition and bullet fragments enter the environment directly upon discharge.¹¹ Concentrations of lead then build up in the water and soil, and wild animals then ingest the lead when they consume contaminated water or soil directly, or when they consume plants or other organisms that have some concentration of lead introduced to them through bioprocesses.¹² Animals can also ingest lead through consuming contaminated game that has been discarded in the environment.¹³ Regardless of the way in which lead or lead-contaminated tissue enters an animal's body, once it burrows into the animal's bloodstream and tissues, it has long-lasting, and sometimes lethal, effects.¹⁴

While lead poisoning is a significant threat to the health of all living organisms, it is particularly a threat to endangered species. The federal government has recognized that scientific evidence demonstrates that the primary source of lead poisoning for wildlife, such as the California condor, the bald eagle, and the grizzly bear, is spent lead ammunition.¹⁵ The California condor has

⁶ *Id.*

⁷ Deborah J. Pain et al., *Effects of Lead from Ammunition on Birds and Other Wildlife: A Review and Update*, 48 *AMBIO* 935, 936 (2019).

⁸ *Id.*

⁹ See *Sources of Lead*, N.Y. DEP'T OF HEALTH, <https://www.health.ny.gov/environmental/lead/sources.htm#firearms> (Apr. 2010) [<https://perma.cc/PM8N-KQY6>].

¹⁰ Pain et al., *supra* note 7, at 937.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.* at 939.

¹⁴ See *id.* at 936.

¹⁵ *Lead Bullet Risks for Wildlife & Humans*, NAT'L PARK SERV., <https://www.nps.gov/pinn/learn/nature/leadinfo.htm> (Sept. 24, 2019) [<https://perma.cc/U9VS-YY3J>].

been listed as an endangered species since March 1967,¹⁶ and the grizzly bear has been listed as a “threatened” species since July 1975.¹⁷ The U.S. Fish and Wildlife Service (“USFWS”) has recently reviewed a petition to reclassify the grizzly bear from “threatened” to “endangered.”¹⁸ After completing a comprehensive review of the grizzly bear’s status based on the best available scientific data in March 2021, the USFWS declined to recommend a change in the grizzly bear’s listed status.¹⁹ The grizzly bear’s status will be once again subject to review in five years.²⁰ The Endangered Species Act demands the implementation of protective measures for those endangered species that face the threat of extinction;²¹ however, there has been minimal regulation of the use of lead ammunition for hunting game at the federal level, despite the overwhelming amount of evidence demonstrating the toxic effect of lead on wildlife.

This note will explore EPA’s authority under the Endangered Species Act (“ESA”) to promulgate regulations banning the use of lead ammunition for any purpose. Section II discusses the impact of lead on the environment and wildlife and demonstrates how even small amounts of lead discharged into the environment through hunting practices can have lethal effects on wildlife, especially scavengers, such as the California condor and the grizzly bear. Section III discusses the current regulations that exist to control the discharge of lead into the environment from the use of other common substances, such as paint and gasoline, demonstrating that the federal government has recognized the toxic effect of lead and has taken steps to eliminate the presence of lead in the natural environment. Then, Section IV discusses how

¹⁶ *California Condor (Gymnogyps Californianus)*, U.S. FISH & WILDLIFE SERV., <https://ecos.fws.gov/ecp/species/8193> [https://perma.cc/KJY7-VNVA].

¹⁷ *Grizzly Bear (Ursus Arctos Horribilis)*, U.S. FISH & WILDLIFE SERV., <https://ecos.fws.gov/ecp/species/7642> [https://perma.cc/EG3N-YJVK].

¹⁸ Endangered and Threatened Wildlife and Plants; Review of Domestic Species That Are Candidates for Listing as Endangered or Threatened; Annual Notification of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions, 85 Fed. Reg. 73,164, 73,175 (Nov. 16, 2020) (to be codified at 50 C.F.R. pt. 17).

¹⁹ Press Release, USFWS, Grizzly Bears in Lower-48 States to Retain Threatened Status Under Endangered Species Act (Mar. 31, 2021), <https://www.fws.gov/mountain-prairie/pressrel/2021/03312021-Grizzly-Bears-Lower-48-States-Retain-Threatened-Status-Under-ESA.php>.

²⁰ *Id.*

²¹ See Endangered Species Act of 1973, 16 U.S.C. §§ 1533(d), (f).

the federal government can leverage the Endangered Species Act to enact a complete prohibition of the use of lead ammunition and how the Act might even mandate such a prohibition based on an interpretation of § 9, which prohibits the “taking” of endangered species. Section V provides a model state statute to demonstrate the positive impact a largescale ban on the use of lead ammunition can have on wildlife populations, provided that sufficient monitoring and enforcement practices are applied. Then, Section VI discusses the hurdles regulations restricting the use of lead ammunition face, such as lobbying efforts by opposing groups, including the National Rifle Association (“NRA”), despite the overall necessity and positive impact of a nationwide ban on the use of lead ammunition and the lack of evidence demonstrating any negative impact a regulation would have on hunters. Finally, Section VII discusses alternatives to lead ammunition for hunting purposes, demonstrating that alternatives are not only widely available, but are also just as practical and cost effective as bullets composed of lead.

I. THE IMPACT OF LEAD ON THE ENVIRONMENT AND WILDLIFE

The evidence demonstrating the nexus between lead entering the environment through spent ammunition and wildlife deaths is overwhelming. Lead is a toxic substance that attacks an organism’s core anatomical systems. Lead has been found to impact the “haematopoietic, vascular, nervous, renal, immune and reproductive systems” of contaminated wildlife.²² While some species are more susceptible to negative impacts from lead absorption than others, lead content can compromise an affected organism’s immune system and increase risk of contraction of infectious disease, parasite infestations, and death.²³ Increased instances of lead poisoning in a population also pose a threat to the survival of a species as a whole because it impacts the reproductive systems of both male and female birds, through impacting egg size, hatching rates, sperm viability, and survival rate of offspring.²⁴

The physical properties of lead make this substance particularly lethal because of its ability to easily move through

²² Pain et al., *supra* note 7, at 936.

²³ *Id.* at 936–37.

²⁴ *Id.* at 944–45.

natural systems and remain in the environment for a long time. Lead is susceptible to change within the environment to which it is introduced based on atmospheric conditions, and how it interacts within the environment depends on geochemical processes, such as oxidation, precipitation, and absorption.²⁵ Once lead bullets are discharged from a firearm, lead enters the environment in the form of bullet fragments. The fragments do not stay in the form of a bullet, and “eventually will be transformed into particulates, ionic species, compounds, or complexes that are dispersed in the environment.”²⁶

Then, depending on atmospheric conditions, the fragments become soluble and mobile, and the lead then easily moves through the natural environment in water and soil.²⁷ Directly or indirectly, wildlife is then exposed to lead when it consumes lead dissolved in water, soil, plants or microorganisms that have taken up lead through its natural processes, or animals that have consumed lead.²⁸ One bullet “can fragment into hundreds of small pieces,” making the substance much more widely available to scavengers ingesting contaminated animal tissue,²⁹ as well as more likely to leach into soil and be taken up by plants and organisms ingesting particles in soil and water. Once the lead is ingested and absorbed by the body, it “is transported in the bloodstream and deposited rapidly into soft tissues.”³⁰ The toxic substance infiltrates the animal’s organs, particularly the liver and kidneys, its bones, and in the case of birds, its growing feathers.³¹

Scavenger birds, such as bald eagles and the California condor, and carnivorous mammals, such as the grizzly bear, are particularly susceptible to lead poisoning from consuming animal carcasses with lead in their body tissue.³² Once a bullet fragments inside an animal, the entire animal is potentially contaminated with lead.³³ Samples taken from venison packaged for sale for

²⁵ THE WILDLIFE SOC’Y, SOURCES AND IMPLICATIONS OF LEAD AMMUNITION AND FISHING TACKLE ON NATURAL RESOURCES 12 (2008).

²⁶ *Id.*

²⁷ *Id.*

²⁸ Pain et al., *supra* note 7, at 937.

²⁹ Bellinger et al., *supra* note 5, at A 178.

³⁰ Pain et al., *supra* note 7, at 936.

³¹ *Id.*

³² See THE WILDLIFE SOC’Y, *supra* note 25, at 16.

³³ Jon M. Arnemo et al., *Health and Environmental Risks from Lead-based Ammunition: Science Versus Socio-Politics*, 13 ECOHEALTH 618, 619 (2016).

human consumption have been found to contain “high concentrations of lead.”³⁴ This finding demonstrates that even in the absence of cognizable bullet fragments, lead can still be embedded in the animal tissue, posing a threat to any organism that consumes the animal. Lead poisoning has been identified as one of the leading causes of death for the California condor.³⁵ As a scavenger, the California condor’s diet consists mainly of dead animal carcasses, particularly those carcasses of cattle and deer.³⁶ Whenever a condor feasts on the carcass of a targeted game animal, such as a deer, it risks exposure to lead by ingesting meat tainted with lead from bullet fragments.³⁷ Scientists testing the blood of free-flying condors in Pinnacles National Park in California semi-annually have found that most of the condors there contain a level of lead in their blood that exceeds the threshold at which the Center for Disease Control (“CDC”) would deem a human child “at risk” for negative health impacts caused by lead ingestion.³⁸ Samples taken from some condors have yielded blood lead levels that are 80 times the amount of that “at risk” threshold.³⁹ Such a high blood lead level could be lethal to condors.⁴⁰ Indeed, many condors at the Park have required “emergency, life-saving treatment” due to lead poisoning by the time they reach seven years old.⁴¹ If the majority of condors in the Park require life-saving treatment at least once before they reach breeding age, one could infer that the majority of, if not all, condors have accumulated an amount of lead in their blood, tissues, and bones that could severely compromise critical anatomical systems, such as the immune and reproductive systems. Therefore, it is critical that the federal government takes steps to prevent lead from entering the natural environment through restrictions and prohibitions on the use of lead-based materials, particularly lead-based ammunition used for hunting game. The federal government has previously enacted statutes and regulations to severely restrict

³⁴ *Id.*

³⁵ THE WILDLIFE SOC’Y, *supra* note 25, at 16.

³⁶ *California Condor*, NAT’L GEOGRAPHIC, <https://www.nationalgeographic.com/animals/birds/facts/california-condor> [https://perma.cc/CLN9-TND9].

³⁷ *See id.*

³⁸ NATIONAL PARK SERVICE, *supra* note 15.

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

or outright ban the use of lead in common substances, such as paint and gasoline, upon a finding that the discharge of lead through the use of these substances into the natural environment had a negative impact on human health. The federal government must leverage its authority to enact strict regulations on this other major source of lead that poses a significant risk to wildlife when these animals either ingest spent lead ammunition or substances contaminated by the spent bullet fragments. The government can no longer ignore the evidence demonstrating the substantial impact lead from spent ammunition has on endangered species.

II. CURRENT REGULATION OF LEAD AMMUNITION AND LEAD IN OTHER SUBSTANCES

Regulation of lead is not a novel concept, and the federal government has already regulated the use of lead to some degree, both in ammunition for hunting and common substances such as paint and gasoline, following a determination that ingestion of lead has negative health impacts. The U.S. Fish and Wildlife Service (“USFWS”) has previously promulgated regulations restricting the use of lead ammunition for purposes of hunting game. USFWS has promulgated a regulation limiting the amount of lead that is permissible for ammunition used by hunters pursuing migratory birds.⁴² Specifically, USFWS “will not approve as nontoxic any shot type or shot coating with a lead content of one percent or more.”⁴³ Pursuant to 50 C.F.R. § 20, the USFWS has a process for approving the material of ammunition to be used for hunting purposes.⁴⁴ The purpose of this approval process originates from research showing that “[d]eposition of toxic shot and release of toxic shot components in waterfowl hunting locations are potentially harmful to many organisms[] . . . [and that] ingested spent lead shot causes significant mortality in migratory birds.”⁴⁵ Environmental impact statements (“EIS”) issued by USFWS in 1976 and 1986 support

⁴² Approval of Nontoxic Shot Types and Shot Coatings, 50 C.F.R. § 20.134 (2021).

⁴³ *Id.* § 20.134(b).

⁴⁴ Migratory Bird Hunting; Approval of Corrosion-Inhibited Copper Shot as Nontoxic for Waterfowl Hunting, 82 Fed. Reg. 51,358, 51,359 (Nov. 6, 2017) (to be codified at 50 C.F.R. pt. 20).

⁴⁵ *Id.*

this approval process.⁴⁶ In the background section of the USFWS' Final Rule approving a type of copper shot for use in hunting waterfowl under 50 C.F.R. § 20.134, the USFWS mentions how the 1986 EIS amendment supported a ban on the use of lead shot based on scientific evidence.⁴⁷ Specifically, the findings in the 1986 EIS supported “prohibiting lead shot use in waterfowl hunting in areas where lead poisoning is a known or potential problem for waterfowl or bald eagles.”⁴⁸ This recommendation was based on findings of large concentrations of lead in the blood, liver, and other body parts of birds sampled for this study.⁴⁹ The EIS also confirms that USFWS was aware that wildlife could ingest lead from directly ingesting spent ammunition or from ingesting other animals that are contaminated with lead from the bullets used for hunting.⁵⁰ Thus, USFWS has recognized lead is a toxic substance that is harmful to the environment and wildlife and that its use in products that deposit lead into the natural environment necessitates some sort of regulation. However, the level of regulation falls short of what is needed to adequately protect wildlife, especially endangered species.

Regulations banning, or even severely restricting, the use of lead in ammunition for hunting lag behind regulations banning the use of lead in other materials, such as paint and gasoline. Such materials consisted of toxic amounts of lead before the government realized the inherent danger the lead in these substances pose. For example, paint manufacturers added lead to paint because lead made the paint more durable and more adhesive to surfaces.⁵¹ Efforts to ban the use of lead in paint began in the 1950's upon the realization of the link between lead in paint and “neurobehavioral” symptoms, including “cognitive impairment, shortening of attention span with increased risk for attention deficient or hyperactivity disorder, and increased risk for antisocial and

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ News Release, Dep't of the Interior, U.S. Fish and Wildlife Serv. Publishes Supplemental Env't Impact Statement on Lead Poisoning in Migratory Birds 1 (Dec. 26, 1985) <https://www.fws.gov/news/Historic/NewsReleases/1985/19851226.pdf> [https://perma.cc/SX2Q-JEJS].

⁴⁹ *See id.*

⁵⁰ *Id.*

⁵¹ David O'Connor et al., *Lead-based Paint Remains a Major Public Health Concern: A Critical Review of Global Production, Trade, Use, Exposure, Health Risk, and Implications*, 121 ENV'T INT'L 85, 86 (2018).

criminal behavior,” exhibited by children consistent with lead exposure.⁵² In 1977, the Consumer Product Safety Commission effectively banned the use of lead in paint and other products “customarily produced or distributed for sale to or for use, consumption, or enjoyment of consumers in or around a household, in schools, [or] in recreation[.]”⁵³ This regulation was promulgated pursuant to the Federal Consumer Product Safety Act in which Congress mandates the imposition of a ban on products that “present[] an unreasonable risk of injury” on consumers and for which there is no safety standard that “would adequately protect the public from the unreasonable risk of injury associated with such product.”⁵⁴ The Commission recognized the lead content in paint and other products accessible to children imposed an unreasonable risk that no safety standard could abate.⁵⁵

Similarly, the federal government has banned the use of lead in gasoline following the recognition of the negative health impacts that can result from inhaling airborne lead particles emitted from vehicles. Beginning in the 1920’s, lead was blended with gasoline to “boost octane levels.”⁵⁶ High octane levels are attractive to consumers because fuel with higher octane levels is more stable than fuel with lower octane levels.⁵⁷ In 1976, the federal government, through the Clean Air Act (“CAA”) and EPA regulations promulgated pursuant to the CAA, began to phase out the content of lead in gasoline.⁵⁸ This act of phasing out the use of lead in gasoline was supported by the courts. In *Ethyl Corp. v. EPA*, the court upheld EPA’s rule regulating the amount of lead in gasoline because there was a rational basis for this agency action.⁵⁹ Scientific data revealed the severe risk lead-based gasoline posed to human health, highlighting that lead “at higher concentrations

⁵² *Id.* at 95–96.

⁵³ 16 C.F.R. § 1303.1(b) (2021).

⁵⁴ 15 U.S.C. § 2057.

⁵⁵ 16 C.F.R. § 1303.1(c).

⁵⁶ Press Release, U.S. EPA, EPA Takes Final Step in Phaseout of Leaded Gasoline (Jan. 29, 1996), <https://archive.epa.gov/epa/aboutepa/epa-takes-final-step-phaseout-leaded-gasoline.html> [https://perma.cc/RP95-PDHS].

⁵⁷ *Gasoline Explained*, U.S. ENERGY INFO. ADMIN. (Nov. 18, 2020), <https://www.eia.gov/energyexplained/gasoline/octane-in-depth.php> [https://perma.cc/NNF6-T9AV].

⁵⁸ *See Gasoline Explained Gasoline and the Environment*, U.S. ENERGY INFO. ADMIN., (Nov. 19, 2020), <https://www.eia.gov/energyexplained/gasoline/gasoline-and-the-environment.php> [https://perma.cc/287L-2ZCY].

⁵⁹ *Ethyl Corp. v. EPA*, 541 F.2d 1, 55 (D.C. Cir. 1976).

is toxic, causing anemia, severe intestinal cramps, paralysis of nerves, fatigue, and even death.”⁶⁰ Moreover, lead in gasoline contributed to 90 percent of the lead content found in the air, and the court recognized that this lead content could be easily controlled by simply removing lead from gasoline.⁶¹

Just as the federal government can easily remove lead from the air by restricting its use in gasoline, the federal government can easily remove lead from the water and soil by banning its use in ammunition for hunting purposes. It is clear from widespread prohibitions on the inclusion of lead in gasoline, paint, and other substances with which humans frequently come into contact that the government recognizes the toxic and even lethal nature of lead. If the government prohibits the use of lead in many every-day substances, why would it allow the continued use of lead in the ammunition used by hunters when hunting game given that there is a high risk of lead moving through natural systems to poison wildlife and even humans? The federal government certainly has the authority to promulgate regulations restricting or banning the discharge of a harmful substance into the natural environment because of the negative health impacts that substance has on wildlife exposed to the substance. EPA’s rule effectively banning the use of the toxic pesticide DDT out of concern for its lethal effect on endangered species provides further precedential support for a new regulation banning the use of lead ammunition because of its known negative impact on the environment and wildlife.

In 1972, the EPA issued an order pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (“FIFRA”) effectively banning the registration and use of any substance that contained DDT.⁶² Like lead, DDT was widely used as a pesticide because of how effective it was in common substances. DDT was successful in killing insects, such as mosquitoes, that carry lethal viruses, such as malaria and typhus, and it was successful in protecting crops and livestock from harmful insects.⁶³ However, in 1972, the EPA proceeded to phase out the use of DDT and issued a cancellation order for most applications of the pesticide following scientific findings of the adverse impact of DDT on the environment, wildlife,

⁶⁰ *Id.* at 8.

⁶¹ *Id.* at 9.

⁶² *Env’t Def. Fund v. EPA*, 489 F.2d 1247, 1250 (D.C. Cir. 1973).

⁶³ DDT Status, *supra* note 2.

and human health.⁶⁴ After extensive study of DDT, EPA has concluded DDT is “known to be very persistent in the environment, will accumulate in fatty tissues, and can travel long distances in the upper atmosphere.”⁶⁵ Based on our understanding of how lead impacts the environment, wildlife, and humans, this same statement could be made about lead. The threat lead poses to the environment and wildlife, especially endangered species, is analogous to the threat that DDT posed. The federal government effectively banned the use of a harmful substance that was useful and convenient for humans in their everyday lives, and it banned the substance out of concern for the negative impact on the environment and wildlife. The concern was not merely only a concern for human health. Therefore, the federal government could follow a similar regulatory path in banning the use of lead for all purposes, including the use of lead-based ammunition for hunting game. While regulations that control the use of lead ammunition exist, these regulations are not stringent enough because studies show that partial bans on the use of lead shot, such as a ban of the use of lead shot in certain protected areas, make little difference in protecting endangered species, like condors and eagles.⁶⁶ While there are countless regulatory paths this type of prohibition can take, the strongest and most successful path will be regulation within the framework of the ESA.

III. ABILITY OF USFWS TO PROMULGATE A RULE UNDER § 9 OF THE ENDANGERED SPECIES ACT EFFECTIVELY BANNING THE USE OF LEAD AMMUNITION BASED ON THE THEORY THAT THE DEATH OR INJURY THAT RESULTS WHEN WILDLIFE CONSUMES SPENT LEAD AMMUNITION COULD BE CONSIDERED A “TAKING” THAT IS UNLAWFUL UNDER THIS PROVISION

The ESA is the federal statute under which the federal government could successfully promulgate a regulation to ban the use of lead ammunition for hunting purposes because lead

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ See Pain et al., *supra* note 7, at 945.

ammunition serves as a source of lead that primarily impacts the natural environment and wildlife, including the endangered species, that live within it. The purpose of the ESA is to protect endangered and threatened species and the ecosystems in which they live, as well as to take appropriate steps to adhere to certain international treaties, such as migratory bird treaties, that are covered by the ESA.⁶⁷ One specific provision not only supports, but requires, the promulgation of a regulation that bans the use of lead shot to protect endangered species.

Under § 9 of the Endangered Species Act, it is unlawful to “take any such species within the United States”⁶⁸ The definition of “take” for purposes of this statute encompasses activity to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”⁶⁹ The requisite legal standard to prove a taking under the ESA is an “actual harm” must have been done to the endangered species.⁷⁰ The USFWS has broadly defined “harm” under the ESA to mean “an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”⁷¹ There is an overwhelming amount of scientific evidence that shows lead significantly impairs the behavioral patterns and survival ability of wildlife.⁷² As lead accumulates in the body tissues of an organism that ingests lead, such poisoning can negatively impact the “haematopoietic, vascular, nervous, renal, immune and reproductive systems.”⁷³ For example, the ingestion of lead can impact a bird’s ability to reproduce by decreasing the reproductive capacity of male sperm and by reducing the hatching rate for eggs laid by female birds affected by lead poisoning.⁷⁴ Further, a mother bird whose blood and tissue have been contaminated by lead can pass this contamination on to

⁶⁷ Endangered Species Act of 1973, 16 U.S.C. § 1531(b).

⁶⁸ *Id.* § 1538(a)(1)(B).

⁶⁹ *Id.* § 1532(19).

⁷⁰ *Am. Bald Eagle v. Bhatti*, 9 F.3d 163, 165 (1st Cir. 1993).

⁷¹ 50 C.F.R. § 17.3 (2021).

⁷² *See, e.g.,* Pain et al., *supra* note 7, at 936.

⁷³ *Id.*

⁷⁴ *Id.* at 944.

her offspring, resulting in weakened immune systems and reduced survival rate of offspring.⁷⁵

Although the definition of “taking” is broad, courts have denied relief to plaintiffs who claim that a hunter’s use of lead shot is a taking under the ESA because of the risk of harm lead shot poses to endangered species, such as bald eagles.⁷⁶ In *American Bald Eagle v. Bhatti*, the First Circuit centered its focus on the word “actually” in USFWS’ definition of “harm.”⁷⁷ In such cases, the plaintiff has the burden of proving that the specific hunt at issue caused actual, rather than potential, injury to an endangered species.⁷⁸ It is not enough to cite scientific findings that the ingestion of lead has an impact on endangered species that is significant enough to be considered a “taking” under the ESA.⁷⁹ In *American Bald Eagle*, the court rejected the plaintiff’s argument that a numerical risk standard should be applied to a “taking” analysis to determine whether an act constituted actual death or injury, reasoning there was not sufficient scientific data available to support a conclusion that a “taking” had occurred because of the numerical probability that an endangered species will be killed or injured by the spent lead ammunition.⁸⁰ Although the plaintiff here was unable to proffer enough evidence to show the link between spent lead ammunition and wildlife deaths, since 1993, scientists have accumulated a substantial amount of data attributing wildlife deaths and injuries caused by lead poisoning to spent lead ammunition. It is likely that sufficient scientific data exists today to allow a court to find that spent lead ammunition, even where the lead content of a poisoned animal cannot be traced to a specific source, does kill and injure wildlife. The numerical probability that lead from spent ammunition is responsible for

⁷⁵ *Id.* at 945.

⁷⁶ See e.g., *Am. Bald Eagle v. Bhatti*, 9 F.3d 163, 166 (1st Cir., 1993) (“There is no evidence that any eagles at Quabbin actually ingested lead slug or that any eagles ate deer carrion containing lead slug. After hearing all of the evidence, and considering among other factors the likelihood of the presence of lead in cripple-loss deer, the likelihood of ingestion of lead by eagles feeding on the deer, and the likelihood that if an eagle ingests lead, it will be harmed thereby, the district judge was not persuaded that the bald eagles would be harmed by the proposed hunt.”).

⁷⁷ See *id.* at 165–66.

⁷⁸ *Id.* at 166.

⁷⁹ See generally *id.*

⁸⁰ See *id.* at 166–67.

poisoning these animals is so great that such instances of lead poisoning cannot reasonably be attributed to another source.

Two years after the First Circuit decided *American Bald Eagle*, the U.S. Supreme Court decided to interpret the meaning of “harm” in the ESA’s definition of “take” and advanced the notion that the meaning of “harm” should be interpreted broadly. The Supreme Court’s decision that “harm” should be interpreted broadly supports the argument that the use of lead ammunition for hunting game should be considered a “taking” under the ESA and that USFWS can successfully ban the use of lead ammunition nationwide pursuant to § 9 of the ESA. In *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, the Court held the definition of “harm” reasonably “include[d] ‘significant habitat modification or degradation that actually kills or injures wildlife.’”⁸¹ In reaching its conclusion, the Court examined the legislative history of the ESA to determine the types of actions Congress intended to penalize for the resulting death or injury of an endangered species.⁸² Based on its analysis of the legislative history, the Court concluded that Congress intended to cover not only intentional acts that directly result in the death or injury of an endangered species, but also acts that incidentally result in the death or injury of an endangered species, such as by modifying or contributing to the degradation of the species’ habitat.⁸³ The Court reasoned that “the broad purpose of the ESA supports . . . extend[ing] protection against activities that cause the precise harms Congress enacted the statute to avoid.”⁸⁴

Moreover, because Congress requires an individual to take steps to mitigate the harm caused by an activity the individual is allowed to perform pursuant to a permit, Congress clearly intended for incidental takings, such as through modification or destruction of habitat that harms wildlife, to be covered by the Act.⁸⁵ Congress clearly intended to protect endangered species from instances of death or injury indirectly caused by actions for which the intended purpose is not to kill or injure that animal. In

⁸¹ *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 708 (1995).

⁸² *See id.* at 704–08.

⁸³ *Id.* at 707–08.

⁸⁴ *Id.* at 698.

⁸⁵ *Id.* at 700–01; citing *Stone v. I.N.S.*, 514 U.S. 386, 397 (1995) (Congress is presumed to have intended a real and substantial effect when it amends a statute; *N.L.R.B. v. Bell Aerospace Co.*, 416 U.S. 267, 275 (1974)).

the case of using lead ammunition for hunting, hunters do not necessarily intend to kill or injure wildlife in the process of legally taking game animals; however, these animals are eventually exposed to and harmed by the lead from the spent ammunition.

Under the Supreme Court's interpretation of § 9 in *Sweet Home*, individuals can be held liable for their actions if those actions incidentally kill or injure an endangered species or significantly modify or degrade the species habitat to such an extent that it leads to the actual death or injury of that animal.⁸⁶ This interpretation supports the promulgation of a rule prohibiting the use of lead-based ammunition for hunting game because of the known impact lead from spent ammunition has on the environment and wildlife. As discussed in Section II, the physical properties of lead allow the substance to easily move through water and soil to be taken up by plants and organisms.⁸⁷ The discovery of particles of lead in the venison packaged for sale for human consumption suggests lead is embedded in the tissues of contaminated animals even in the absence of physical bullet fragments.⁸⁸ Moreover, since the majority of free-flying California condors in Pinnacles National Park have received emergency, life-saving treatment for lead poisoning by the time they turn seven years old,⁸⁹ it reasons that lead is abundantly available in the condor's habitat. Clearly, lead is being discharged into the habitat of endangered species, such as the California condor, through spent bullet fragments in a cumulative amount that is significantly modifying and degrading the species' habitat. Lead can stay in the soil and water, and it is present in condor's food source. Thus, the condor cannot survive in its habitat when the potential exposure to lead is so significant. This threat to the survival of the species certainly provides support to the argument that lead modifies and degrades the species' habitat, resulting in actual death and injury to those animals. Such modification and degradation of the condor's habitat provides a strong basis for a regulation prohibiting the discharge of lead-based ammunition into the natural environment.

⁸⁶ See *Babbitt*, 515 U.S. at 708.

⁸⁷ See THE WILDLIFE SOC'Y, *supra* note 25, at 12.

⁸⁸ Arnemo et al., *supra* note 33, at 619.

⁸⁹ NAT'L PARK SERV., *supra* note 15.

IV. MODEL STATE LAW HIGHLIGHTS THE IMPORTANCE OF A COMPLETE BAN

In July 2019, a California law banned the use of firearms or projectiles not certified as nonlead when taking any wildlife.⁹⁰ This total prohibition on the use of lead ammunition to take wildlife anywhere within California's borders resulted from a decade's worth of lawmaking and scientific studies. In 2007, the California state legislature enacted the Ridley-Tree Condor Preservation Act out of concern for the California condor population, the majority of which was suffering from the effects of lead poisoning following exposure to the toxic substance mainly from eating contaminated animal carcasses.⁹¹ As enacted in 2007, the Act prohibited using lead ammunition to take big game within specified areas in an effort to preserve the condor population in those areas.⁹² In addition, the Act required the California Fish and Game Commission to conduct ongoing studies of the blood lead levels in condors and publish a report that compiled and analyzed the data derived from testing the condors' blood.⁹³ The mandate requiring studies and reports proved useful in measuring the overall success of the legislation because such studies provided insight as to whether hunters were complying with the restrictions, whether officials were appropriately enforcing the restrictions, and whether the scope of the area in which the use of lead ammunition was banned was sufficient.

Based on the data collected since 2007, the state legislature sought to amend the Act in 2013 to broaden the scope and the overall impact of the Act by gradually expanding the size of the area covered by the ban from specified condor protection areas to the entire state.⁹⁴ In support, the legislature cited evidence that grazing cattle can ingest lead from spent ammunition, as well as

⁹⁰ CAL. CODE REGS. tit. 14, § 250.1 (2019), see also CAL. FISH & GAME CODE § 3004.5(i) (West 2021).

⁹¹ 2007 Cal. Legis. Serv. ch. 570 § 3(a) (West) (codified as CAL. FISH & GAME CODE § 3004.5); see also S. RULES COMMITTEE, S. FLOOR ANALYSES, S. AB 821, 2007-2008 Sess., at 2 (2007).

⁹² 2007 Cal. Legis. Serv. ch. 570 § 3(a) (West); see also CAL. FISH & GAME CODE § 3004.5(a)(1) (West 2021).

⁹³ 2007 Cal. Legis. Serv. ch. 570 § 3(d) (West); see also CAL. FISH & GAME CODE § 3004.5(e) (West 2021).

⁹⁴ See *Hunting: Nonlead Ammunition: Hearing on A.B. 711 Before the S. Comm. On Nat. Res. & Water*, 2013-2014 Reg. Sess. (Cal. 2013).

evidence that spent ammunition negatively impacts other bird species, “such as bald eagles, golden eagles, turkey vultures, red-tailed hawks[,] . . . ravens, . . . mourning doves, ring-necked pheasants and wild turkeys.”⁹⁵ The amended Act mandated the Fish and Game Commission to promulgate regulations by July 2015 that would establish the phased approach through which the Commission would gradually expand the area in which the use of lead ammunition was prohibited until the restrictions covered the entire state on July 1, 2019.⁹⁶ The Commission did promulgate such regulations,⁹⁷ and the Commission set various dates at which certain areas or types of game would become covered under the Act between July 2015 through July 2019.⁹⁸

The rollout of this pivotal legislation can serve as a helpful model for other states to enact their own laws banning the use of lead shot or as a model for the USFWS, who can use successful parts of the rollout in California to implement a complete ban on the use of lead shot across the country pursuant to the ESA. One critical way to ensure the success of the law is to provide cost incentives, which California did, by requiring the Fish and Game Commission to develop a coupon program that would “provide hunters with nonlead ammunition at no or reduced charge.”⁹⁹ In addition to providing cost incentives, California sought to raise awareness of the law and educate hunters throughout the state. Following implementation of the amendment, the California Department of Fish and Wildlife participated in public outreach by “coordinat[ing] question and answer sessions at sportsmen’s shows, h[olding] meetings with hunting organizations, host[ing] a series of public workshops throughout the state[,] and sen[ding] letters to major ammunition manufacturers.”¹⁰⁰ In addition, the California Department of Fish and Wildlife’s website includes a user-friendly list of answers to frequently asked questions about the new law, including what the law entails, where hunters can access a list of approved types of ammunition, the cost and availability of nonlead ammunition, and what hunters can do with

⁹⁵ *Id.* at 2.

⁹⁶ CAL. FISH & GAME CODE § 3004.5(i) (West 2021).

⁹⁷ *See* CAL. CODE REGS. tit. 14, § 250.1(d)(3) (2019).

⁹⁸ *Id.* § 250.1(d).

⁹⁹ CAL. FISH & GAME CODE § 3004.5(d)(1) (West 2021).

¹⁰⁰ *AB 711 Implementation Public Outreach*, CAL. DEP’T OF FISH & WILDLIFE, <https://wildlife.ca.gov/Hunting/Nonlead-Ammunition/Public-Outreach> [<https://perma.cc/UR4Q-TGAR>].

the lead bullets they have stockpiled.¹⁰¹ One reason why hunters are reluctant to switch to using nonlead ammunition is they have already stockpiled lead ammunition.¹⁰² California solves this problem by allowing the continued use of lead bullets at shooting ranges for target practice.¹⁰³ The shooting ranges will properly dispose of the spent ammunition and even recycle the bullets containing lead.¹⁰⁴ These policy initiatives are critical to the successful rollout of the statewide ban because they help ensure compliance with the law to the fullest extent, which is especially important considering the popularity of hunting in California. In 2020, the Department of Fish and Wildlife issued 286,277 hunting licenses.¹⁰⁵ While the California law includes a provision detailing the hefty fines a hunter can incur for violating the law,¹⁰⁶ it is unrealistic to expect enforcement officials to inspect every hunter's ammunition to ensure compliance. California must rely on effective education, cost incentives, and the integrity of the state's game hunters to ensure the overall success of the legislation and promote the ongoing effort to preserve the condor population. The federal government should take note of these policy tactics so that it can employ the most successful tactics in its own program to gradually ban the use of lead ammunition nationwide. Unfortunately, while the California law indicates that a ban on the use of lead ammunition will have a positive impact on wildlife and could provide the protection for endangered species that the ESA mandates, the federal government faces some significant hurdles, primarily in the form of opposing lobbyist groups, in passing similar legislation at the federal level.

¹⁰¹ See *generally Nonlead Ammunition in California*, CAL. DEP'T OF FISH & WILDLIFE, <https://wildlife.ca.gov/hunting/nonlead-ammunition#250462360-i-have-thousands-of-bullets-made-of-lead-what-do-i-do-with-them-now> [https://perma.cc/29K4-YSDE].

¹⁰² 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> [https://perma.cc/585R-JEBF].

¹⁰³ *Frequently Asked Questions*, tab under *Nonlead Ammunition in California*, CAL. DEP'T OF FISH & WILDLIFE, <https://wildlife.ca.gov/hunting/nonlead-ammunition#250462360-i-have-thousands-of-bullets-made-of-lead-what-do-i-do-with-them-now> [https://perma.cc/8BK3-D5NS].

¹⁰⁴ *Id.*

¹⁰⁵ *Hunting*, CAL. DEP'T OF FISH & WILDLIFE (JULY 31, 2021), <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178041&inline> [https://perma.cc/U6Z7-4TMX].

¹⁰⁶ CAL. FISH & GAME CODE § 3004.5(g).

V. IMPACT OF LOBBYISTS AND WIDESPREAD OPPOSITION ON LACK OF EFFECTIVE REGULATION FOR USE OF LEAD AMMUNITION

Regulation of lead shot is highly controversial, and despite the widespread availability of cost-effective alternatives, opposers to the regulation of lead shot continue to serve as a major hurdle to effective policymaking. Despite scientific findings in the 1980s that supported a recommendation to ban the use of lead shot in areas inhabited by waterfowl and bald eagles, the USFWS recognized that regulations prohibiting the use of lead shot would face opposition.¹⁰⁷ At that time, regulations mandating the use of nontoxic shot and prohibiting the use of lead ammunition already faced controversy and required state approval prior to enforcement by the federal agency.¹⁰⁸

Not only does opposition to the regulation of lead shot still exist today, but it has been fueled by powerful lobbyist groups that have an enormous influence on government action. The National Rifle Association (“NRA”) has an interest in challenging bans on the use of lead ammunition for hunting purposes, and its frequent challenges pose a significant threat to the advancement of any sort of effective regulation here due to the NRA’s impact on governmental action as a lobbyist group, as well as its impact on the opinions of the American public. The NRA advocates for the continued allowance of the use of lead ammunition, claiming lead ammunition is more effective for hunting and more affordable than alternatives.¹⁰⁹ The NRA also claims that lead ammunition does not have any negative impact on wildlife and that advocates for the regulation and ban of the use of lead ammunition are actually advocating for a ban on hunting altogether.¹¹⁰ The purpose of this rhetoric is to portray regulation banning the use of lead shot as unnecessary and as a general precursor to an outright ban on hunting. The NRA’s conclusion serves to negate any scientific

¹⁰⁷ See e.g., News Release, Dep’t of the Interior, *supra* note 48.

¹⁰⁸ *Id.*

¹⁰⁹ *Traditional Ammunition (Lead)*, NAT’L RIFLE ASS’N INST. FOR LEG. ACTION., <https://www.nraila.org/campaigns/huntingconservation/facts-at-a-glance-traditional-ammo/> [https://perma.cc/R5JJ-WJD8].

¹¹⁰ See *id.*

findings by the USFWS that restrictions on the use of lead shot are necessary to protect wildlife and humans from the negative health impacts caused by ingestion of lead, as well as any findings that alternatives to lead shot are widely available, effective, and inexpensive. Such influence on public opinion is corrosive because the American people decide who is elected to the executive branch, who, in turn, decide who controls the USFWS, and thus the regulations promulgated by the agency.

The overall influence by the NRA on lead shot restrictions is emphasized by the group's participation in lawsuits calling for the prohibition of the use of lead ammunition. For example, the NRA intervened as a defendant in *Center for Biological Diversity v. Jackson*, where environmental groups challenged the EPA's denial of a petition "seeking the regulation of lead shot, bullets, and fishing sinkers under the Toxic Substances Control Act."¹¹¹ The NRA, together with Safari Club International ("SCI"), filed a motion for leave to intervene in the matter, claiming that "[t]he rights and interests of NRA/SCI members will be impaired and impeded if . . . [the] lawsuit is successful because 1) the relief CBD Plaintiffs seek . . . could ultimately lead to an effective ban on the sale, manufacture, and distribution of fishing tackle and ammunition containing lead."¹¹² NRA's interest in cases in which environmental organizations advocate for a ban on the use of lead ammunition stems from the NRA's interest in preserving traditional methods of hunting and protecting its members' interests in being free from "unreasonable and unnecessary restrictions."¹¹³ The organization argued that regulations banning lead-based ammunition would harm its members' interests because bullets made from alternative materials are not as effective and are more expensive than lead-based bullets.¹¹⁴

Moreover, the organization warned that if hunting became more expensive, many hunters would no longer participate in the sport, and the loss of revenue experienced by state-level fish and game departments because of a reduction in sale of hunting licenses would actually harm the environment and wildlife through a reduction in funding available for conservation

¹¹¹ Ctr. for Biological Diversity v. Jackson, 815 F. Supp. 2d 85, 87 (D.D.C. 2011).

¹¹² Motion to Intervene at 1, Ctr. for Biological Diversity v. Jackson, 815 F. Supp. 2d 85 (D.D.C. 2011) (No. 1:10-cv-2007).

¹¹³ *Id.* at 6.

¹¹⁴ *See id.* at 13–14.

initiatives.¹¹⁵ The District Court granted the NRA's motion to intervene, and subsequently, all defendants moved to dismiss the Center for Biological Diversity's claim, which was granted for lack of subject matter jurisdiction.¹¹⁶ The court did not address whether the plaintiff had a valid claim or whether EPA had the authority to promulgate regulations restricting the use of lead ammunition.¹¹⁷ This case provides just one example of how influential certain groups can be when opposing initiatives to regulate the discharge of lead into the natural environment, even when alternative materials exist.

Opposition to a ban on the use of lead shot is so widespread that an effort by the former Director of USFWS to begin the phasing out of the use of lead shot in favor of nontoxic alternatives was immediately thrown out. On the eve of Donald Trump's ascension to the presidency in January 2017, the outgoing Director of the USFWS issued an order with the purpose of "expanding the use of nontoxic ammunition and fishing tackle" on lands and waters managed by the USFWS, with an ultimate goal of phasing out the use of lead in these recreational products by January 2022.¹¹⁸ The Order cited multiple sources of authority under which such an Order could be promulgated, including the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, the Endangered Species Act, and the National Wildlife Refuge Recreation Act.¹¹⁹ Less than two months later, the new Secretary of the Interior revoked the Order.¹²⁰ In revoking the Order, the Secretary stated that "the Order is not mandated by any existing statutory or regulatory requirement."¹²¹ It is important to note the use of the term "mandated," rather than a term like "permitted." "Mandated" indicates that such a regulation was permitted under existing statutes. It is possible the Secretary revoked the Order because such a regulation conflicted with the interests of lobbyist groups or members of a political party. Here, however, both Orders provide support to the argument that a regulation expanding

¹¹⁵ *Id.* at 14.

¹¹⁶ *Ctr. for Biological Diversity*, 815 F. Supp. 2d at 87.

¹¹⁷ *Id.*

¹¹⁸ See U.S. FISH & WILDLIFE SERV., DIR.'S ORD. 219, USE OF NONTOXIC AMMUNITION AND FISHING TACKLE (2017).

¹¹⁹ *Id.*

¹²⁰ U.S. DEP'T OF THE INTERIOR, SEC'Y OF THE INTERIOR, ORDER NO. 3346 §§ 1-6 (2017).

¹²¹ *Id.*

restrictions on the use of lead ammunition is possible under the United States' current statutory framework and that such regulations only face political, rather than legal, opposition. If advocates can successfully educate interested parties on the availability, practicality, and cost-effectiveness of alternatives for lead based bullets, then such challenges may be easier to overcome in the future.

VI. ALTERNATIVES TO LEAD AMMUNITION

A regulation that bans the use of lead ammunition for hunting under all circumstances would not negatively impact one's ability to hunt game because of the widespread availability of cost-effective alternatives on the market that have been approved for hunting by the USFWS under 50 C.F.R. § 20.21. USFWS has a list of approved nontoxic shot types.¹²² This list identifies fourteen types of nontoxic shot that may be used to take migratory game birds.¹²³ In providing the list of nontoxic shot types that are permissible for taking migratory game birds, the USFWS specifies that "[e]ach approved shot type must contain less than 1 percent residual lead."¹²⁴ By providing a list of approved nontoxic shot types, the USFWS is not impeding the ability of hunters to pursue game. Further, the existence of this list and the requirement that lead make up no more than one percent of each approved shot type suggests that USFWS recognizes the impact of lead on the environment and wildlife and that the use of lead in ammunition could violate its international migratory bird treaties.

Alternatives not only exist but are widely available and cost-effective. Companies that manufacture ammunition offer a wide variety of "lead-free bullets designed for taking all species of North American game."¹²⁵ Further, bullets that are used for hunting that traditionally consisted of lead are now available in materials that are lead-free, and such lead-free bullets are compatible with cartridge designations already used by hunters loading their

¹²² 50 C.F.R. § 20.21(j)(1) (2021).

¹²³ *Id.*

¹²⁴ *Id.* at § 20.21(j)(2).

¹²⁵ Vernon George Thomas, *Lead-Free Hunting Rifle Ammunition: Product Availability, Price, Effectiveness, and Role in Global Wildlife Conservation*, 42 *AMBIO* 737, 739 (2013).

firearms with lead-core bullets.¹²⁶ The existence of alternatives supports the argument that the complete ban of the use of lead ammunition will not negatively impact the activities of hunters currently using lead shot, thus directly challenging the NRA's prophecy that a complete ban on the use of lead shot will impair the ability of hunters to pursue game and ultimately lead to a ban on hunting altogether.

CONCLUSION

There is an overwhelming amount of evidence demonstrating the negative health impacts that spent lead ammunition has on wildlife. This source of lead can have a devastating impact on endangered species populations, which is of particular interest to Congress based on its enactment of the Endangered Species Act. It is clear that a nationwide ban on the use of lead ammunition is necessary, and the USFWS can promulgate a regulation pursuant to the Endangered Species Act based on a broad interpretation of the "takings" clause. Not only does the statutory framework already exist, but a state law banning the use of lead ammunition for any purpose when taking game animals anywhere in the state has been shown to be successful in preserving the endangered California condor population.

The availability of scientific data, the known positive impact of a prohibitory regulation, and federal regulations restricting the use of lead ammunition in some capacity already exist. The only obstacle that stands in the way of a nationwide ban is opposition by lobbying groups, such as the NRA, and others who may not be aware of the available alternatives. However, this challenge can be overcome by increased awareness and cost incentives. A nationwide ban on the use of lead ammunition is not only possible, but necessary for the continued survival of endangered species, and it is critical that the federal government uses the tools it has to take these protective measures. The federal government used these tools once before to ban the use of DDT following the dire warning of Rachel Carson's "Silent Spring" that we must immediately take action to protect vulnerable species, human health, and the environment. Now is the time to renew calls to action to protect wildlife once again from unnecessary exposure to

¹²⁶ *Id.*

a toxic substance and prevent the silence in nature caused by elimination of the species who help the natural world thrive.