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Table of Contents

ARTICLES

by prohibiting most water diversions outside the Great Lakes Basin. However, the Compact's effectiveness is undermined by critical legal vulnerabilities, including the "bottled water loophole," which allows substantial water extraction if held in containers of 5.7 gallons or less. Additionally, the ambiguous definition of "public use" leaves the Compact susceptible to exploitation by private interests, while the inconsistent approval process for "straddling community" applications creates opportunities for divergence from its intended purpose.

This Note explores the historical and legal context of Great Lakes water governance, analyzes key diversion applications, and situates current Compact weaknesses within the global water crisis. It proposes targeted amendments to close the bottled water loophole, standardize approval processes for straddling communities through regional majority voting, and establish a clearer definition of public use. These reforms are necessary to fortify the Compact against corporate exploitation, preserve the ecological integrity of the Great Lakes, and protect this indispensable resource for future generations.

Table of Contents continued

Bred to Suffer: A Consideration of Agricultural Breeding Practices and Farmed Animal Welfare

Meghan Jones*

Introduction

For as long as humans have existed, we have impacted the world around us. It is easy to imagine how our hunting prowess influenced wild animal behaviors and evolution; as humans became more skilled, animals had to adapt to prevent predation.[1] As humans shifted away from hunter-gatherer lifestyles and toward agrarian societies, humans began to have increasing control over the animals we consumed.[2] The perhaps unintentional influence over animal populations via our hunting preferences became more intentional as we assumed control over not just how and when animals died, but how and when they were born.[3] As it pertains to animals raised for food, certain species were first selected to be domesticated, both prioritizing and producing animals with tamer, more docile behaviors. As our understanding of genetics improved, these domesticated animals were selectively bred to become more "productive," or able to provide more food and materials for human use using fewer resources.[4]

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[1] Fred W. Allendorf & Jeffrey J. Hard, *Human-Induced Evolution Caused by Unnatural Selection Through Harvest of Wild Animals*, 106 Proc. Nat'l Acad. Scis. 9987, 9988 (2009).

[2] *See* Jean-Denis Vigne, *The Origins of Animal Domestication and Husbandry: A Major Change in the History of Humanity and the Biosphere*, 334 Comptes Rendus Biology 171, 172 (2011).

[3] *Id.*; Gillian P. McHugo et al., *Unlocking the Origins and Biology of Domestic Animals Using Ancient DNA and Paleogenomics*, 17 BMC Biology 1, 10 (2019).

[4] Christine Tait-Burkard et al., *Livestock 2.0 – Genome Editing for Fitter, Healthier, and More Productive Farmed Animals*, 19 Genome Biology 1, 5 (2018).

The advent and widespread use of artificial insemination in the agricultural industry around the mid-1900s exacerbated the speed at which these so-called improvements could occur, and it was around this time that we began to see extreme, rapid changes in farmed animal genetics and productivity.[5] From the 1960s to 2005 alone, selecting for advantageous traits resulted in pigs' ability to lay 50% larger litters, chickens raised for meat (henceforth called "broiler chickens" or "broilers") gaining double the weight in half the amount of time, hens laying 30% more eggs per year, and cows raised for dairy producing 67% more milk.[6] In the quest for maximum productivity, cows, pigs, chickens, turkeys, fish, and other farmed animals' bodies are forced into hyper-drive: growing larger and faster than ever before and reproducing in higher quantities with more frequency, all at the cost of increased disease rates, physical limitations, immobility, and higher mortality.[7]

Not only has productivity-focused breeding impacted individual animals, but it has also impacted genetic diversity on farms in the United States. For example, "over 90% of U.S. dairy cows are Holsteins; eight of the fifteen breeds of swine raised in the U.S. in the middle of the twentieth century no longer exist; only five breeds make up nearly the entire U.S. poultry flock, and almost all white eggs come from one variety of chicken."[8] Not only does this lack of genetic diversity contribute to increased potential for disease spread, but it also demonstrates that most animals farmed in the United States have been bred with maximum productivity in mind.[9]

After centuries of selective breeding culminating in the overtaxed animal bodies of today, increases in technology are further pushing the envelope of what is possible: genetically engineered animals that are more productive and less aggressive, provide healthier and more sustainable foods for humans, and shapeshift to better fit and respond to an industrialized farming system.[10] These transgenic technologies

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[5] *Id.* at 2; Timothy J. Parkinson & Jane M. Morrell, *Artificial Insemination*, *in* Veterinary Reprod. & Obstetrics, 746, 746 (David E. Noakes, Timothy J. Parkinson & Gary C.W. England eds., 10th ed. 2019).

[6] Tait-Burkard et al., *supra* note 4, at 2.

[7] Este van Marle-Köster & Carina Visser, *Unintended Consequences of Selection for Increased Production on the Health and Welfare of Livestock*, 64 Archives Animal Breeding 177, 179-80 (2021).

[8] *Biodiversity and Corporate Control*, Ctr. for Food Safety, https://www.centerforfoodsafety.org/issues/302/animal-cloning/biodiversity (last visited Mar. 8, 2025).

[9] *Id.*

[10] *See generally* Andrew B. Perzigian, *Detailed Discussion of Genetic Engineering and Animal Rights: The Legal Terrain and Ethical Underpinnings*, Animal Legal & Hist. Ctr. (2003), https://www.animallaw.info/article/detailed-discussion-genetic-engineering-and-animal-rights-legal-terrain-and-ethical.

allow scientists to combine genetic material not just between different species, but also between taxonomic kingdoms, such as placing bacteria genes into animals or animal genes into plants.[11] Ultimately, genetic engineering has the potential to strip sentient beings of their bodily integrity, setting the stage for a dystopian future wherein senseless, animal-adjacent beings are responsible for the bulk of food consumed.[12]

This Article seeks to explore the implications of unregulated breeding practices on the welfare of current and future farmed animals, demonstrate how existing legislation has failed to protect farmed animals from these harms, and consider avenues to address these concerns. First, this Article will investigate how the selective breeding of farmed animals has impacted the health and welfare of broiler chickens, layer hens, dairy cows, pigs, turkeys, and fish. It will then consider transgenic breeding practices and how this technology threatens the bodily integrity of future farmed animals. Finally, this Article will demonstrate how current laws fail to regulate or control these harmful practices before proposing potential interventions to better regulate the profit-focused, cruelty-inducing biological manipulation of farmed animals. Ultimately, this Article seeks to prove that modern farmed animals have been bred to suffer, and that regulation of breeding is necessary to protect farmed animal welfare.

I. The Animal Welfare Impacts of Selective Breeding

A. Broiler Chickens

Chickens raised for meat, or broilers, have been selectively bred to become as large as possible, as quickly as possible.[13] Between 1925 and 2024, commercial broiler chickens have gone from reaching a 2.5 pound market weight in 112 days to reaching 6.57 pounds in less than half the time.[14] This immense weight gain and accelerated growth rate physically taxes the bird's skeletal, respiratory, and circulatory systems, resulting

[11] George Kimbrell & Paige Tomaselli, *A Fisheye Lens on the Technological Dilemma: The Specter of Genetically Engineered Animals*, 18 Animal L. 75, 85 (2011).

[12] Bernice Bovenkerk et al., *Brave New Birds: The Use of "Animal Integrity" in Animal Ethics*, 32(1) Hastings Ctr. Rep. 16, 16 (2002).

[13] Laura M Dixon, *Slow and Steady Wins the Race: The Behaviour and Welfare of Commercial Faster Growing Broiler Breeds Compared to a Commercial Slower Growing Breed*, Plos One (Apr. 6, 2020), https://doi.org/10.1371/journal.pone.0231006.

[14] *See U.S. Broiler Performance*, Nat'l Chicken Council (Feb. 2022), https://www.nationalchickencouncil.org/about-the-industry/statistics/u-s-broiler-performance/ (listing the market weight of broiler chickens every five years since 1925 until 2005, where it then lists the market weight every year).

in an increased incidence of lameness, bone disorders, skin lesions, and mortality.[15] It is not just the addition of weight that impacts mobility, but the distribution of the weight as well; increasing chickens' breast muscle yield to meet consumer preferences has caused their breasts to become both larger and broader, changing the chickens' natural physiology, and forcing their center of gravity to move forward.[16] These changes impact the birds' walking ability and gait, and place additional mechanical stresses on their legs and hip joints.[17] Fast-growing modern breeds spend more time sitting than slower-growth breeds—behaviors indicative of chronic pain and discomfort.[18] This pain and lessened mobility make it difficult or impossible for the birds to access food or water, which can lead to increased mortality due to starvation or dehydration. Prolonged periods of sitting or lying on the often urine-saturated litter that is commonplace in commercial chicken-rearing facilities increase the incidence of breast blisters, hock burns, and foot pad burns.[19] In addition to being painful, these lesions can be a gateway for bacteria to enter the body, which may spread through the bloodstream and cause joint inflammations or lead to increased susceptibility to other bacterial infections, which can then spread to other chickens.[20] Due to the decreased genetic diversity of flocks as a result of productivity-focused selective breeding, if one animal is susceptible to an infection, they likely all are, making it easy for bacterial infections to spread and flourish.[21]

Notably, mobility is not the only physiological side effect of rapid growth rates, as this profit-focused growth also results in low thyroid hormone concentrations, low metabolic rates, hypertrophy, and increased potential for heart complications.[22] By changing the ratio

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[15] S.C. Kestin et al., *Prevalence of Leg Weakness in Broiler Chickens and its Relationship with Genotype*, 131 Veterinary Rec. 190, 193 (Aug. 29, 1992); *see* Scientific Committee on Animal Health and Animal Welfare, *The Welfare of Chickens Kept for Meat Production (Broilers)*, European Comm'n 29-50 (Mar. 21, 2000), https://food.ec.europa.eu/system/files/2020-12/sci-com_scah_out39_en.pdf [hereinafter SCAHAW] (discussing the welfare problems associated with broiler chicken, focusing on mortality, skeletal disorders, muscle disorders, contact dermatitis, ascites, sudden death syndrome, respiratory and mucous membrane problems, stress indicators, thermal discomfort, and behavioral restriction).

[16] SCAHAW, *supra* note 15, at 9.

[17] *Id.*

[18] C.A. Weeks & S.C. Kestin, *Effect of Leg Weakness on the Behaviour of Broilers*, 39(S1) British Poultry Sci. 8, 8 (1998).

[19] SCAHAW, *supra* note 15, at 38.

[20] *Id.*

[21] W. Gilbert et al., *Review: Mitigating the Risks Posed by Intensification in Livestock Production: The Examples of Antimicrobial Resistance and Zoonoses*, 15(2) Animal – Int'l J. Animal Biosciences 1, 3 (2021).

[22] *Leg and Heart Problems in Broiler Chickens*, Compassion World Farming (Jan. 2003), https://www.animallaw.info/article/leg-and-heart-problems-broiler-chickens.

of energy-supplying and energy-consuming organs, chickens have an increased need for oxygen, coupled with a decreased oxygen supply.[23] Essentially, so much energy is used turning the food they consume into meat, less energy is available for other metabolic processes. This places major stress on their cardiac system, leaving them susceptible to two forms of heart failure, ascites (fluid retention in the abdomen), and sudden death syndrome.[24]

In addition to the pain and suffering experienced by broilers, it is also necessary to consider the welfare of their parents; referred to by the industry as "breeding stock."[25] While most broiler chickens will be killed at just eight weeks old, birds raised for breeding will be kept alive for up to sixty weeks.[26] Because broilers are bred to grow rapidly, broiler breeders are underfed to slow their growth so they can live long enough to reach sexual maturity.[27] Not only are broilers bred to convert feed to weight rapidly, they are also bred to have increased appetites to incentivize consumption.[28] Selectively breeding birds that have large appetites and then underfeeding select groups of them to ensure that they live long enough to be able to reproduce results in broiler breeders that experience chronic hunger, frustration, and other abnormal behaviors.[29]

B. Layer Hens

Modern breeds of hens raised for egg production (henceforth referred to as "layer hens") in the United States are thought to have originated from the red jungle fowl, which laid around ten to fifteen eggs per year.[30] Selectively bred over time to maximize the number of eggs laid, modern hens will lay as many as 250 to 300 eggs each year.[31] The stress placed on their reproductive systems in order to lay so many eggs often results in osteoporosis and other reproductive disorders.[32] Eggshells require large amounts of calcium to produce, and laying

[23] *Id.*

[24] *Id.*

[25] Dixon, *supra* note 13.

[26] *Id.*

[27] *Id.*

[28] *Id.*

[29] *Id.*

[30] MN Romanov & S. Weigendt, *Analysis of Genetic Relationships Between Various Populations of*

Domestic and Jungle Fowl Using Microsatellite Markers, 80 Poultry Sci. 1057, 1057 (2001).

[31] National Agriculture Statistics Service et al., *Southern Region News Release Chickens and Eggs*, U.S. Dep't of Agric. (Feb. 24, 2025), https://downloads.usda.library.cornell.edu/usda-esmis/files/fb494842n/6395z3349/d504tg591/ckeg0225.pdf.

[32] *See* A.B. Webster, *Welfare Implications of Avian Osteoporosis*, 83 Poultry Sci. 184, 185-186 (2004).

nearly one egg per day as opposed to one egg per month means that their needs for calcium have grown significantly, often resulting in calcium leaching from their bones to make up for this deficit.[33] Because of this, it is estimated that 80% to 89% of commercial egg-laying hens suffer from osteoporosis, which causes a higher incidence of bone fractures, a leading cause of mortality in egg-laying hens.[34] The incidence of these bone fractures is further exacerbated by rough handling and the intensive confinement associated with common industrial farming methods.[35]

In addition to osteoporosis and its resulting complications, layer hens also suffer from cloacal prolapse, a condition in which the outer end of the reproductive tract fails to retract after an egg has been laid.[36] Additional complications may arise if other hens peck at the prolapsed part of the oviduct, which leads to hemorrhages, infection, cannibalism, and can result in death.[37] Due to heavy egg production, the hormone activity of commercial layer hens is also affected, predisposing them to salpingitis, an inflammation of the reproductive tract caused by bacterial E. coli infection.[38] In severely affected hens, the oviduct thins, and masses of caseous exudate (oozing material) form, which can expand and fill the body cavity, leading to further complications and eventually death.[39] The overproduction of eggs in modern layer hens is also attributed to higher rates of cancer and other tumors in the oviduct, which can be a leading cause of death for chickens who are not culled prematurely due to drops in production rates.[40]

C. Dairy Cows

Similar to the ways that layer hens have been bred to optimize the efficiency of their reproductive systems, dairy cows have been bred to maximize milk production.[41] Cows, like all other mammals, only produce milk to feed their young, meaning that they must become

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[33] *Id.* at 185.

[34] *See id.* at 188.

[35] C.C. Whitehead & R.H. Fleming, *Osteoporosis in Cage Layers*, Poultry Sci. 1033, 1033, 1036 (July 1, 2000).

[36] Subhasish Ray et al., *Prolapse in Laying Hens: Its Pathophysiology and Management*, Indian J. Animal Prod. Mgmt., 17, 18 (2013).

[37] *Id.* at 18.

[38] H. John Barnes et al., *Colibacillosis*, *in* Diseases of Poultry (12th ed., 2008).

[39] *Id.*

[40] P.A. Johnson et al., *The Domestic Chicken: Causes and Consequences of an Egg A Day*, 94 Poultry Sci. 816-820, 816 (2015).

[41] *See generally* John B Cole et al., *The Effects of Breeding and Selection on Lactation in Dairy Cattle*, 13 Animal Frontiers 55 (2023).

pregnant and give birth in order to produce milk.[42] Milk production has increased dramatically in the past few decades: in 1944, the average dairy cow produced 548 gallons of milk in one year, while the average dairy cow today is able to produce 2,429 gallons of milk in the same amount of time.[43] This increased production comes at multiple costs to each cow's wellbeing, such as increased disease incidence and decreased fertility and longevity.[44] The development and use of artificial insemination has dramatically changed the dairy industry, contributing to inbreeding in the dairy industry, which has resulted in decreased fertility.[45] While difficulty conceiving may not directly affect a dairy cow's welfare, the inability to conceive does render her economically useless to dairy farmers, nearly ensuring her early death.[46] For example, 26.3% of cows slaughtered in U.S. dairy operations are culled for reproductive issues.[47] The use of artificial insemination has also led to the increased incidence of genetic defects such as bovine leukocyte adhesion deficiency, deficiency of uridine monophosphate synthase, and complex vertebral malformation.[48]

Genetic selection for high milk yields has also been found to be a leading predisposing factor for mastitis, a painful infection of the udders.[49] In the most recent study conducted, it was found that 99.7% of dairies in the United States, essentially all, reported having at least one case of mastitis within a year, with about one-fourth of all cows suffering from clinical mastitis at any given point.[50] Data shows that clinical mastitis is the most commonly reported health problem in the dairy industry, responsible for 16.5% of recorded deaths, and is a leading reason for removal and slaughter.[51]

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[42] *Id.*

[43] Alexandra Chang, *Charting New York's Milky Way*, Cornell Coll. Agric. & Life Scis. (2016), https://cals.cornell.edu/news/charting-new-yorks-milky-way.

[44] *See* van Marle-Köster & Visser, *supra* note 7.

[45] *Id.*

[46] *Id.*

[47] *Dairy 2007, Part I: Reference of Dairy Cattle Health and Management Practices in the United States, 2007*, U.S. Dep't of Agric. 89 (2007), https://www.aphis.usda.gov/sites/default/files/dairy07_dr_parti.pdf.

[48] van Marle-Köster & Visser, *supra* note 7, at 180-81.

[49] *See* Minna Koivula et al., *Genetic and Phenotypic Relationships Among Milk Yield and Somatic Cell County Before and After Clinical Mastitis*, 88 J. Diary Sci. 827 https://www.sciencedirect.com/science/article/pii/S0022030205727478?ref=pdf_download&fr=RR-2&rr=9267dccb0862f26d.

[50] *Dairy 2014, Health and Management Practices on U.S. Dairy Operations, 2014*, U.S. Dep't of Agric. (2014), https://www.aphis.usda.gov/sites/default/files/dairy14_dr_partiii.pdf.

[51] *Id.*

D. Pigs

In the 1990s, fast-growing, "ultralean hybrid" pigs gained popularity despite the negative impacts on their mental and physical well-being.[52] As a result of these shifts in breeding, pigs began experiencing increased occurrences of metabolic diseases like porcine stress syndrome (PSS) and mulberry heart disease, among other muscular defects.[53] PSS causes pigs to be susceptible to stress, with symptoms like difficulty breathing, discolored skin, and heart attacks occurring more frequently as a result of that stress.[54] Pigs suffering from PSS may also experience tremors of the tail, back, or leg muscles, muscle rigidity, an inability to walk, respiratory distress, hyperthermia, blotchy dermal hyperemia, acute heart failure, and death.[55]

Over time, pigs have also been bred to give birth to larger litters to maximize their productivity, which comes with a host of additional problems.[56] Large litter sizes not only place physical strain on the mother pig, but they can also lead to increased piglet mortality.[57] With litter sizes of sixteen or more piglets, mother pigs' uteruses become cramped with fetuses, resulting in lower birth weights for piglets and higher disparity among birth weights.[58] This affects the welfare of piglets both in-uterine and postpartum, as competition for limited resources such as blood supply, uterine space, and colostrum increases rates of piglet hypoxia before birth, and threatens their ability to survive once born.[59] Larger litters also cause greater stress and discomfort for mother pigs, symptoms which not only pose welfare concerns in and of themselves, but which have also led to unfortunate attempts by the industry to address these concerns by housing pregnant and nursing sows in gestation and farrowing crates—spaces so small that she cannot fully turn around—which severely threatens her freedom of movement and physical liberty,

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[52] Temple Grandin & Mark J. Deesing, *Genetics and the Behavior During Handling, Restraint, and Herding*, *in* Genetics and the Behavior of Domestic Animals 115, 132 (Temple Grandin & Mark J. Deesing eds., 2d ed. 2014).

[53] Gianfranco Brambilla et al., *Response to Oxidative Stress as a Welfare Parameter in Swine*, 7 Redox Rep. 159, 159 (2002), https://www.tandfonline.com/doi/epdf/10.1179/135100002125000406?needAccess=true.

[54] E. Lambooij, *Transport of Pigs*, *in* Livestock, Handling, & Transportation 228, 230 (Temple Grandin ed., 3d ed. 2007).

[55] *Porcine Stress Syndrome (PSS)*, Iowa State Univ., https://vetmed.iastate.edu/vdpam/about/focus-areas/swine/swine-disease-manual/index-diseases/PSS (last visited Mar. 1, 2025).

[56] Sophia A. Ward et al., *Are Larger Litters a Concern for Piglet Survival or an Effectively Manageable Trait?*, 10 Animals 309 (Feb. 2020).

[57] *Id.*

[58] *Id.*

[59] *Id.*

and can contribute to additional stress which only further exacerbates the aforementioned impacts of PSS.[60]

E. Turkeys

Welfare issues resulting from the profit-focused selective breeding of turkeys somewhat mirror those for broiler chickens. The average weight of a turkey has increased from 15.1 pounds in 1960 to 31.1 pounds in 2017, with turkeys reaching this doubled market weight in half the amount of time than they used to.[61] This increased growth results in leg disorders, including bone deformities, lameness, tibial dyschondroplasia, and ruptured tendons, as well as metabolic diseases, such as ascites and sudden death syndrome.[62] Modern turkeys are bred so large, with such large breasts, that they can no longer naturally reproduce.[63] Therefore, all modern commercially raised turkeys exist due to artificial insemination, which encompasses additional welfare implications concerning the process of semen extraction.[64] Sudden death is also a concern for fast-growing turkey breeds, which is often associated with perirenal hemorrhage, which induces acute heart failure and bleeding of the kidneys.[65] Like broiler breeders, turkeys used for breeding are underfed to increase longevity, and it has been found that at the termination of breeding, at least 75% of breeders suffered from abnormal gait or lameness, and 25% suffered destructive cartilage loss in the hip joint.[66]

F. Fish

As with terrestrial animals raised for food, fishes are also selectively bred for economically desirable traits, such as rapid growth and disease resistance.[67] In the case of salmon, manipulating

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[60] *Id.*; *What Are Gestation Crates for Pigs and Why Are They Bad?*, The Humane League (Sept. 15, 2021), https://thehumaneleague.org/article/pig-gestation-crates.

[61] Alexis C. Madrigal, *Turkeys Are Twice as Big as They Were in 1960*, Atlantic (Nov. 22, 2017), https://www.theatlantic.com/technology/archive/2017/11/turkeys-are-twice-as-big-as-they-were-in-1960/546104/.

[62] *An HSUS Report: Welfare Issues with Selective Breeding for Rapid Growth in Broiler Chickens and Turkeys*, The Humane Soc'y of the U.S., https://www.humanesociety.org/sites/default/files/docs/hsus-report-breeding-chicken-turkeys-welfiss.pdf.

[63] *Id.*

[64] *Id.* As it does for all species for which artificial insemination is used.

[65] *Id.*

[66] *Id.*

[67] *An HSUS Report: The Welfare of Animals in the Aquaculture Industry*, Humane Soc'y of the U.S., https://www.humanesociety.org/sites/default/files/docs/hsus-report-animal-welfare-aquaculture-industry.pdf (last visited Feb. 24, 2024).

the environment in which fertilized eggs are placed can increase the incidence of triploid chromosomes, resulting in females who will not reach sexual maturity—an economically desirable advantage for producers.[68] Unfortunately, as with terrestrial farmed animals, these economic advantages for the industry come at the expense of the individuals' welfare.[69] Mortality is approximately twice as high in triploid versus diploid salmon, and triploid salmon may also be physiologically less equipped to transport oxygen in their blood than diploid salmon, making them more easily affected by conditions of low oxygen and high density, which are commonplace in the aquaculture industry.[70] Triploid fish are also at a higher risk of developing cataracts, which can lead to blindness, hindering their ability to find food and often resulting in starvation.[71]

II. Transgenic Breeding: Welfare Solution, or Dystopian Disaster?

Recent advances in breeding technology have resulted in a greater ability to adapt an animal's genome to both select for, and in some cases create, new advantageous traits.[72] Examples include the development of genome editing, where individual nucleotides can be introduced, removed, or substituted within an animal's genome, and transgenic modification, which is the splicing of foreign DNA sequences into a different organism.[73] Transgenic modification was developed in 1973 when antibiotic resistant DNA was cut from one strain of bacteria and placed into another.[74] Just one year later, the successful transmission of DNA was completed in an animal for the first time, when foreign

[68] *See* S.A. McGeachy et al., *Freshwater Performance of Triploid Atlantic Salmon (Salmo Salar) in New Brunswick Aquaculture*, 137 Aquaculture 333, 333 (1995).

[69] Peter Stevenson, *Closed Waters: The Welfare of Farmed Atlantic Salmon, Rainbow Trout, Atlantic Cod & Atlantic Halibut*, Compassion in World Farming, https://www.ciwf.org.uk/media/3818650/closed-waters-welfare-of-farmed-atlantic-salmon.pdf (last visited Apr. 5, 2025).

[70] *Id.*

[71] *Id.*

[72] *Intentional Genomic Alterations (IGAs) in Animals*, FDA., https://www.fda.gov/animal-veterinary/biotechnology-products-cvm-animals-and-animal-food/intentional-genomic-alterations-igas-animals (Feb. 27, 2025).

[73] *Id.*

[74] Gabriel Rangel, *From Corgis to Corn: A Brief Look at the Long History of GMO Technology*, Harvard Univ. Sci. in the News (2015), https://sitn.hms.harvard.edu/flash/2015/from-corgis-to-corn-a-brief-look-at-the-long-history-of-gmo-technology/.

DNA was placed in a mouse.[75] Genetic engineering differs greatly from selective breeding in that selective breeding requires organisms to be similar to one another, namely requiring animals of the same species.[76] Transgenic modification allows genes to be isolated and extracted from one organism and introduced into another organism that could be entirely dissimilar.[77] Transgenic modification opens the doors to vast advances in genetic manipulation, and is heralded by many supporters as being capable of increasing the economic productivity of animals raised for food. Transgenic modification is also seen as a way to respond to the consequences of the intensive confinement that is inherent in modern agriculture by designing animals who are more resistant to disease, less aggressive, and born without certain traits or body parts that otherwise impede maximum productivity.[78] Initial projects included the "EnviroPig" pigs who were genetically engineered to produce less phosphorus in their manure in efforts to reduce the environmental impacts of commercial pig production to address consumer demand for more sustainable meat.[79] Other projects include pigs engineered to contain more Omega-3 fatty acids in their meat, cows engineered to be resistant to mastitis and bovine spongiform encephalopathy, and plans to engineer turkey hens—which are prevented from brooding over their eggs when housed in battery cages on industrial farms—to "silence" their "mothering gene" and thus remove that instinct.[80] These may seem like improvements that would positively affect animal welfare and the environmental footprint of animal agriculture, but it is important to note that manipulations touted as being advantageous to welfare are often only considered when they are aligned with benefits for human producers and consumers. In these cases, welfare is simply an unintentional side-effect of the ultimate goal to increase productivity, lower costs, and improve the ease of rearing animals for food. While genetic improvements to improve welfare may be possible, it is unclear whether it would ever be economically advantageous to pursue these traits over other traits with greater economic potential and fewer welfare benefits. As has been demonstrated by decades of profit-focused breeding to date, when animal welfare and human profit are at odds, animals often lose, and as technology increases our ability to improve animal welfare via genetics, it is unconvincing that there will be a sudden change of heart by the industry to prioritize welfare above profit.

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[75] *Id.*

[76] *Id.*

[77] *Id.*

[78] *Id.*

[79] Björn Petersen, *Transgenic Pigs to the Rescue*, Nat'l Libr. of Med. (May 22, 2018), https://pmc.ncbi.nlm.nih.gov/articles/PMC5963916/.

[80] Kimbrell & Tomaselli, *supra* note 11, at 87.

It is also worth considering at what point genetic modification has gone too far. Some proponents of genetic engineering highlight its use to mitigate common problems that arise from the intensive confinement of farmed animals in concentrated animal feeding operations. An example of this includes the prospect of breeding cattle without horns, so that the common industry method of disbudding—the painful removal of horns—is no longer necessary.[81] While this could certainly improve animal welfare by eliminating a ubiquitous procedure with associated pain and stress, where would we draw the line? If it is determined that immobile cows are easier to manage, do we begin to breed legless cattle? In a 2002 report, Bernice Bovenker and others grapple with the ethical murkiness of nonhuman bodily integrity that genetic engineering upsets:

Suppose "chicken" eggs could be produced by quasi-chickens: genetically engineered humps of living chicken-flesh that do nothing but lay eggs. Would there be anything amiss with that? Animal ethicists have proposed the notion of animal integrity because of the inability of interests and rights to accommodate the intuition that we should adjust the farm to the animal and not vice versa.[82]

When animals are engineered to better fit the demands placed upon them by modern industrial food production, even if these manipulations would prevent the most egregious forms of cruelty inherent in the industry, they ultimately serve to further entrench the industrial animal agriculture complex.[83] Aptly put by George and Paige Tomaselli, "[e]ngineering chickens to reduce the pain caused by life in factory farm cages is a 'techno-fix' band-aid that treats one symptom but avoids curing the illness: our unsustainable system."[84] Rather than

[81] Agriculture and Horticulture Development Board, *Breeding for Polling in Cattle*, https://signetdata.com/technical/genetic-notes/breeding-for-polling-in-cattle/#:~:text=Polling%20is%20the%20process%20of,such%20as%20the%20Aberdeen%20Angus (last visited Apr. 19, 2025).

[82] Bernice Bovenkerk et al., *supra* note 12, at 16.

[83] *See, e.g.*, Hope M. Babcock, *Grotius, Ocean Fish Ranching, and the Public Trust Doctrine: Ride 'Em Charlie Tuna*, 26 Stan. Env't L.J. 3, 17-25 (2007) (discussing negative environmental, health, and socioeconomic impacts of aquaculture); Dana Cole et al., *Concentrated Swine Feeding Operations and Public Health: A Review of Occupational and Community Health Effects*, 108 Env't Health Perspectives 685, 694 (2000) (describing health impacts); Robin Kundis Craig, *The Other Side of Sustainable Aquaculture: Mariculture and Nonpoint Source Pollution,* 9 Wash U.J.L. & Pol'y 163, 171-73 (2002) (describing negative environmental, health, and socioeconomic impacts); William S. Eubanks, *The Sustainable Farm Bill: A Proposal for Permanent Environmental Change*, 39 Env't L. Rep. 10493, 10498-504 (2009) (detailing the myriad impacts of modern industrial agriculture on air, water, soil, and wildlife); Doug Gurian-Sherman, *CAFOs Uncovered: The Untold Costs of Confined Animal Feeding Operations*, Union of Concerned Scientists 60-61 (2008) (describing health impacts).

[84] Kimbrell & Tomaselli, s*upra* note 11.

responding to the health and welfare problems that arise when animals are housed in intense confinement by engineering animals to be more at ease in these abhorrent conditions, the industry should instead focus on preventing the problems from occurring at the outset.

III. Failure of State and Federal Statutes to Regulate Breeding

A. Current Regulation of Selective Breeding

It is worth considering, based on the vast documented health and welfare concerns attributed to the profit-focused breeding of farmed animals, why regulatory bodies have not yet intervened to prevent these harms. This failure to implement regulations concerning the breeding of animals on farms underscores a systemic deficiency in the legal protections afforded to farmed animals more broadly in the United States.[85] At the federal level, three pieces of legislation apply to the welfare of animals: the Animal Welfare Act (AWA), the Humane Methods of Slaughter Act (HMSA), and the Twenty-Eight Hour Law. The AWA excludes farmed animals from the scope of its regulations, leaving just the HMSA and the Twenty-Eight Hour Law to protect animals raised for food.[86] Unfortunately, both of these laws exclude poultry entirely, which make up 98% of terrestrial animals farmed in the United States, and only regulate the conditions of slaughter and transport, meaning they do not apply whatsoever to how farmed animals are bred, housed, or raised.[87] In terms of legal protections at the state level, all fifty states have statutes which address cruelty to animals, however nearly all either explicitly exempt animals raised for food from the afforded protections, or carve out exemptions for agricultural practices deemed to be "common," "normal," "customary," or "accepted animal husbandry."[88] As selective breeding has been a core component of animal agriculture since its inception, any breeding practices that select for desirable traits would likely be considered a common agricultural practice, and are

[85] *See, e.g.*, Animal Welfare Act, 7 U.S.C. § 2131 (1970); *see also* 9 C.F.R. pts. 1-4 (2025).

[86] Animal Welfare Act, 7 U.S.C. § 2131 (1970); Humane Methods of Slaughter Act, 7 U.S.C. § 1901 (1978); The 28Hour Law, 49 U.S.C. § 80502 (2018).

[87] *See, e.g.*, Animal Welfare Act, 7 U.S.C. § 2131 (1970); *see also* 9 C.F.R., pts. 1-4 (2025); Humane Methods of Slaughter Act, 7 U.S.C. § 1901 (1978); The 28-Hour Law, 49 U.S.C. § 80502 (2018); Petition to Include Poultry Under the Humane Methods of Slaughter Act submitted by Mercy for Animals, 17-06 (2017), https://www.fsis.usda.gov/sites/default/files/media_file/2020-07/17-06-Petition-Mercy-for-Animals.pdf.

[88] David J. Wolfson, *Beyond the Law: Agribusiness and the Systemic Abuse of Animals*, 2 Lewis & Clark Animal L. Rev. 123, 123-124 (1996).

therefore outside of the scope of these state-level protections regardless of the severity of the harm caused.[89]

Despite the lack of protections afforded to farmed animals at the federal level, to date, fourteen states have passed and implemented policies addressing the intensive confinement that occurs on industrial farms.[90] These policies have focused on confinement practices in the pork, veal, and egg industries, often restricting the sale of products from animals housed in gestation crates, veal crates, and battery cages (respectively) or the uses of these methods of confinement outright.[91] The success of these policies is promising, with four passing via ballot initiatives, and the remaining ten laws passing through state legislatures.[92] To date, every farmed animal welfare initiative that has appeared on ballots in the last twenty years has been passed, even in states with large animal industries, making state-level legislation aimed at improving farmed animal welfare a promising avenue for change.[93]

B. Current Regulation of Genetic Engineering/IGAS

Broadly, there appears to be both federal support for and approval of using biotechnology to "improve" farmed animals, and specifically to increase their productivity and profitability. This can be inferred based on both the stated goals of various government agencies including the FDA, USDA, and EPA, and by the awarding of federal grants to support research, such as a 2017 USDA grant award for $724,104.00 to research "heat-resistant cows" in efforts to prepare for worsening climate events in the face of global climate change.[94]

Recently, the Food and Drug Administration (FDA) published nonbinding guidance documents concerning the use of heritable intentional genomic alterations (IGAs) in animals raised for food.[95] Per

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[89] van Marle-Köster & Visser, *supra* note 7, 179-80; *Legal Protections for Animals on Farms*, Animal Welfare Inst. (2022), https://awionline.org/sites/default/files/uploads/documents/22-Legal-Protections-Farm.pdf

[90] Danielle J. Ufer, *State Policies for Farm Animal Welfare in Production Practices of U.S. Livestock and Poultry Industries: An Overview*, Econ. Info. Bull. No. 245, U.S. Dep't of Agric. (2022), https://www.ers.usda.gov/publications/pub-details?pubid=105480 .

[91] *Id.* at 3.

[92] *Id.*

[93] *Id.*

[94] *The Coordinated Framework for the Regulation of Biotechnology*, U.S. Dep't of Agric. (May 2024), https://usbiotechnologyregulation.mrp.usda.gov/eo14081-section8c-plan-reg-reform.pdf; K.M. Sarlo Davila et al., *Genome-wide Association Study Identifies Variants Associated with Hair Length in Brangus Cattle*, Animal Genetics (2020), https://2b85d6d8-04ef-4b38-ba2f-479b346f122a.filesusr.com/ugd/5e4e9c_585d97157b6140439fbc1176bfd357b6.pdf.

[95] Heritable Intentional Genomic Alterations in Animals: Risk-Based Approach Guidance for Industry, 89 Fed. Reg. 35832 (May 2, 2024).

these regulations, companies or persons who have developed a new genetically engineered animal must submit an application for FDA approval before the animal or the products they create can be sold.[96] The FDA makes clear that animal welfare is considered when reviewing these applications, and that the FDA considers "potential changes in an animal's physiology or behavior that interfere with its basic functioning or cause suffering or a potential for elevated susceptibility to disease."[97] However, when peering into a support document with additional guidance for applicants, the only consideration of animal welfare is in regard to animal health, with the following recommendations:

With regard to health of the animals containing IGAs, including the target animal safety requirements of 21 CFR 514.1(b)(8), we recommend that you submit data regarding whether the IGA or its expression product(s) cause any direct or indirect toxicity as well as any risk to human users or animals other than the target animal. In general, we recommend that you compile and submit data and information addressing the health of these animals, which may include animal health and treatment records, growth rates, reproductive function, and behavior. In addition, as determined appropriate, we recommend that you submit data on the physiological status of the animals, including clinical chemistry, hematology, histopathology, and any post-mortem results. We recommend that you collect data from generation(s) of animals or, in the event that animals are not propagated via breeding (e.g., somatic cell nuclear transfer), from alternative grouping(s) of animals as close as possible to those intended for use in commerce.[98]

It is unclear from these documents how exactly the FDA will evaluate animal suffering, and what an allowable impact on animal welfare as a result of inserted genes would look like.[99] Some clarity may be attained by examining what the FDA considers safe enough to not require an application for approval, which includes "IGAs in food animals that are equivalent to genomic sequences that are found in animals of the same species…with a history of safe use in animal agriculture food production."[100] The FDA does not specify what a "history of safe use" looks like, however, it later states that the "FDA also does not expect developers to submit applications or get approval to market IGAs in

[96] *Id.*

[97] *Id.*

[98] Heritable Intentional Genomic Alterations in Animals: The Approval Process Draft Guidance for Industry 89 Fed. Reg. 35834 (May 2, 2024).

[99] *See generally* Heritable Intentional Genomic Alterations in Animals: The Approval Process Draft Guidance for Industry 89 Fed. Reg. 35834 (May 2, 2024); Heritable Intentional Genomic Alterations in Animals: Risk-Based Approach Guidance for Industry, 89 Fed. Reg. 35832 (May 2, 2024).

[100] Heritable Intentional Genomic Alterations in Animals: The Approval Process Draft Guidance for Industry 89 Fed. Reg. 35834 (May 2, 2024).

food animals where (1) the alteration is equivalent to what could be theoretically achieved through conventional breeding."[101] This infers that any genetic alteration that could otherwise be achieved by selective breeding, or which mirrors natural processes would not be reviewed by the FDA, as it would be considered safe without the necessitation of FDA consideration or approval. If the regulatory bodies that are tasked with regulating animal welfare on farms consider the current welfare of animals which have been selectively bred for increased productivity to be acceptable, then the bar for what level of suffering transgenic alterations could allow for is already too low. As the Humane Society of the United States outlines in a comment submitted on a previous draft of the final guidance document, "the welfare of most farmed animal species in the United States is already compromised by conventional genetic selection for production traits at the expense of animal health and well-being. Using biotechnology to stress animals even further to their biological limits will only add to the suffering these animals already endure."[102]

Due to a lack of information in the FDA guidance documents about how they will evaluate the impact of new genetic alterations on animal welfare, it is unclear how welfare impacts will be weighed against other purported benefits of altered genes. Despite the lack of clarity in the guidance documents, clues about how animal health and welfare is evaluated may be found in prior approvals by the FDA. For example, in 2015, the FDA approved the insertion of the opAFP-GHc2 rDNA construct in the EO-1α lineage of Atlantic Salmon (AquAdvantage Salmon), marking the first genetically engineered animal approved for human consumption in the United States.[103] In response to public comments citing concern for the health of the modified salmon, the FDA compared the health of AquAdvantage Salmon to "farm-raised non-GE Atlantic salmon grown under similar fresh water aquaculture conditions," concluding that "AquAdvantage Salmon are as healthy as non-GE farm-raised Atlantic salmon grown under similar fresh water conditions.[104] Unfortunately, as previously mentioned, selectively bred salmon (which would be considered non-GE), do encounter various welfare concerns as a result of their breeding, and further research has implicated additional welfare concerns for farmed Atlantic salmon.[105] When the standard of welfare in non-GE animals is low, protecting the

[101] *Id.*

[102] *Humane Society of the United States Re: Guidance for Industry: Regulation of Genetically Engineered Animals Containing Heritable rDNA Constructs*, FDA (Nov. 18, 2008), https://www.regulations.gov/comment/FDA-2008-D-0394-0252.

[103] *AquAdvantage Salmon*, FDA (2023), https://www.fda.gov/animal-veterinary/intentional-genomic-alterations-igas-animals/aquadvantage-salmon.

[104] *Id.*

[105] Mark Borthwick, *Welfare Issues in Farmed Atlantic Salmon*, Fish Welfare Initiative (2020), https://files.fwi.fish/Salmon_Welfare_Report.pdf.

welfare of engineered animals by using these non-GE counterparts as a baseline of health does not inspire a great deal of optimism about the lengths that the FDA will go to ensure animal wellbeing.

IV. Potential Legal Interventions

Considering the expansive negative impacts that unchecked productivity-focused breeding has caused regarding farmed animal welfare to date, it is imperative that action is taken both to address harms that have already occurred, and to prevent additional harms from occurring. This means not only addressing how to phase out highly productive breeds and traits prevalent in the industry, but also how new advances in breeding technology will be regulated moving forward to ensure that welfare is considered more substantially. In terms of addressing the harms that have already occurred from selective breeding to date, there is positive work being done by animal advocates, farmers, suppliers, and consumers alike, by advocating for the use of slower-growing, less productive breeds in lieu of their fast-growth, highly productive counterparts.[106] Slow-growth chicken breeds, for example, demonstrate markedly reduced incidence of skeletal and leg disease, and lower mortality rates.[107] Potential interventions exploring how to build upon this momentum to cement in legislation the use of these higher-welfare breeds will be discussed below. Other proposed solutions will address how the FDA will regulate the use of IGAs moving forward, and ways to prevent transgenic breeding and other technological advancements from negatively impacting farmed animal welfare moving forward. The proposed solutions in this Section will be addressed in order of feasibility.[108]

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[106] It is important to note that slow-growth breeds do not inherently, nor necessarily, suffer less than fast-growth breeds, and ultimately, the most impactful way to improve farmed animal welfare would be to stop farming and consuming animals altogether. For practical purposes, this Article only considers legal pathways that specifically address the regulation of breeding practices within the context of industrial animal agriculture, as legislative pathways to end exploitation of farmed animals by ending animal agriculture outright are likely infeasible politically. Despite this, the author acknowledges that ultimately animal agriculture, even if utilizing only slow-growth breeds, is still fundamentally flawed. *See* Hannah Ritchie, *Adopting Slower-Growing Breeds of Chicken Would Reduce Animal Suffering Significantly*, Our World in Data (2023), https://ourworldindata.org/adopting-slower-growing-breeds-of-chicken-would-reduce-animal-suffering-significantly.

[107] *See* Anne Fanatico & Holly Born, *Label Rouge: Pasture-Based Poultry Production in France*, Nat'l Ctr. for Appropriate Tech. (2010), http://attra.ncat.org/attra-pub/PDF/labelrouge.pdf; P.D. Lewis et al., *Responses of Two Genotypes of Chicken to the Diets and Stocking Densities Typical of UK and 'Label Rouge' Production Systems: I. Performance, Behaviour and Carcass Composition*, 45 Meat Sci. 501, 515 (1997).

[108] Given the lack of explicit statutes or regulations that consider the welfare

A. State-Level Interventions

As previously mentioned, state-level confinement bans have shown a large degree of success in addressing decreased welfare as a result of confinement.[109] To address the welfare harms which result from productivity-focused breeding, legislation could be enacted to mimic these confinement bans by barring the sale or production within the state of products from animals who have been genetically engineered or selectively bred for specific traits. In the context of chickens raised for meat, there is already significant momentum toward promoting the use of slow-growth or heritage-breed chickens, with multiple organizations within the United States promoting the use of slow-growth or heritage-breed chickens in lieu of faster-growing breeds more commonly used in modern farming, citing improved welfare and overall health.[110] Some grocers have even implemented voluntary policies to source more slow-growth breeds.[111] While this may signal some consumer preference for higher welfare breeds, and some willingness for producers to oblige their customers, it has largely only applied to broiler chickens, and is to date only voluntary and not enforced by any regulatory body.

implications of breeding practices on farmed animals, the ability for litigation to rectify these harms is virtually nonexistent barring an extreme exception of cruelty that results from a non-standard breeding practice, or a violation of the new FDA guidelines concerning genetically engineered animals. Legislation, therefore, will be the focus of this Article, as it is a more attractive pathway toward reform.

[109] *See Farm Animal Confinement Bans by State*, Am. Soc'y for the Prevention of Cruelty to Animals, https://www.aspca.org/improving-laws-animals/public-policy/farm-animal-confinement-bans (last visited Mar. 18, 2025); *Historical Farmed Animal Welfare Ballot Initiatives*, Rethink Priorities, https://rethinkpriorities.org/research-area/a-cost-effectiveness-analysis-of-historical-farmed-animal-welfare-ballot-initiatives/ (last visited Mar. 18, 2025).

[110] Hannah Ritchie, *Adopting Slower-Growing Breeds of Chicken Would Reduce Animal Suffering Significantly*, Our World in Data (2023), https://ourworldindata.org/adopting-slower-growing-breeds-of-chicken-would-reduce-animal-suffering-significantly; *see generally The Science Behind the Better Chicken Commitment*, https://betterchickencommitment.com/us/science/ (last visited Apr. 6, 2025).

[111] *See* Stephanie Torrey et. al., *In Pursuit of a Better Broiler: Growth, Efficiency, and Mortality of 16 Strains of Broiler Chickens*, 100(3) Poultry Sci. 1 (2021), https://doi.org/10.1016/j.psj.2020.12.052; s*ee also Better Chicken Project*, Global Animal P'ship, https://globalanimalpartnership.org/better-chicken-project/ (last visited Apr. 20, 2025); *see also Whole Foods Market Applauds Global Animal Partnership's Enhanced Animal Welfare Standard for Chickens*, Whole Foods Mkt. (Mar. 17, 2016), https://media.wholefoodsmarket.com/whole-foods-market-applauds-global-animal-partnerships-enhanced-animal-welf/.

There is not yet a popular push for consumers to choose products which originate from layer hens with decreased egg yields or dairy cows with decreased milk volume. Additionally, most animal advocacy groups tend to suggest that consumers focus on how animals are raised, such as promoting the consumption of cage-free or free-range eggs, rather than promoting the consumption of eggs from more moderately productive layer hens.[112] This is not to say that regulating these traits would be impossible. Implementing limits on annual egg yields, milk production, and litter sizes could be feasible. Particular breeds with known health and welfare concerns could also be banned outright, as breed-specific bans at the local level are somewhat common regarding certain dog breeds that have been deemed dangerous to humans.[113] While many animal welfare advocates oppose dog breed-specific bans, citing concerns for both human guardians and the dogs themselves, these bans are aimed at eliminating breeds stereotyped as being aggressive.[114] Banning dog breeds or certain traits found in dogs due to inherent welfare concerns associated with selective breeding may be more popular amongst advocates, and is not unprecedented: many European municipalities and some European countries have enacted laws that ban the breeding of animals with certain features.[115] While these laws currently apply only to dogs, similar bans on specific traits or breeds of farmed animals could be enacted at local and state levels in the United States, accomplished either via ballot measures or by legislative campaigns.

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[112] *See Higher Welfare Alternatives for Hens*, Compassion in World Farming, https://www.ciwf.com/farmed-animals/chickens/egg-laying-hens/higher-welfare/ (last visited Mar. 9, 2025); *Humane Farm Animal Care Standards Edition 21: Laying Hens*, Certified Humane, https://certifiedhumane.org/wp-content/uploads/Standard_LayingHens-2023.pdf (last visited Mar. 14, 2025).

[113] *Anti-Dog Breed-Specific Legislation by State*, Best Friends Animal Soc'y, https://bestfriends.org/pet-care-resources/anti-dog-breed-specific-legislation-state (last visited Mar. 9, 2025).

[114] *How to Take Action Against Dog Breed-Specific Legislation*, Best Friends Animal Soc'y, https://bestfriends.org/pet-care-resources/how-take-action-against-dog-breed-specific-legislation (last visited Mar. 18, 2025).

[115] *Extreme Breeding in Europe – Mapping of Legislation*, Eurogroup for Animals (2023), https://www.eurogroupforanimals.org/files/eurogroupforanimals/2023-11/2023_11_30_Extreme%20breeding%20in%20Europe%20-%20Mapping%20of%20legislation%20FINAL.pdf (Municipalities with codified bans on short muzzles, hairlessness, or large skin folds include Belgium, Luxembourg, the Netherlands, Austria, Sweden and Switzerland, while Belgium and Switzerland have banned the breeding of certain breeds of animals entirely. Additional legislation includes bans on the breeding of animals that will produce offspring that are likely to suffer because of the genetic or phenotypic makeup of the parent animals (e.g. Belgium, Germany, Luxembourg, the Netherlands, Austria, Finland, Sweden, Switzerland and the United Kingdom) and bans on the importation, sales, and marketing of certain breeds/extreme features (e.g., Belgium and Austria)).

B. Federal-Level Interventions

1. USDA Organic Guidelines

At the federal level, there are multiple opportunities to address both selective breeding and genetic engineering, especially when examining the regulatory scopes of the USDA and FDA. Perhaps the most feasible impact could be accomplished by amending the USDA organic standards to include stricter regulations for breeding practices. Current U.S. organic standards, which are determined and regulated by the USDA, already ban the use of genetically engineered animals, and regulate the origin of livestock, with specific requirements for "breeder stock."[116] This illustrates that the regulation of breeding methods is within the scope of the USDA's authority. These regulations should be expanded to further exclude the use of certain breeds or traits known to adversely impact health and welfare. For example, the United Kingdom's organic standards require the use of slow-growing chicken breeds, which are breeds that grow no more than forty-five grams per day—this is a standard that could be mirrored in the United States' guidelines.[117] While these restrictions would only apply to producers seeking to achieve USDA organic certification and therefore would impact a much smaller percentage of animals raised for food in the United States, they could protect many animals, increase public awareness of the harms associated with profit-focused breeding, and increase consumer demand for higher welfare breeding practices.

2. New FDA Regulations for IGAs

In a similar vein, current FDA guidelines to regulate IGAs should be amended to include more explicit requirements for evaluating animal welfare. As the guidance documents currently suggest, welfare is a concern of the FDA and is within its purview, yet the language remains vague as to what that evaluation entails.[118] The FDA should be petitioned to amend these guidance documents to include how welfare will be considered, and to what standard of welfare animals with IGAs will be held to. Ideally, the standard needs to be above that of the existing level of welfare of non-GE selectively bred farmed animals. While this

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[116] 7 C.F.R. § 205.2 (2024); 7 C.F.R. § 205.236 (2024).

[117] *Organic Standards for Great Britain*, Soil Ass'n (2024), https://www.soilassociation.org/media/23378/gb-farming-growing.pdf (last visited Mar. 9, 2025); Council Directive 834/2007, 889/2008, & 1235/2008 (Great Britain Organic Standards).

[118] Heritable Intentional Genomic Alterations in Animals: Risk-Based Approach Guidance for Industry, 89 Fed. Reg. 35832 (May 2, 2024).

intervention stops short of banning genetic engineering outright, it could significantly raise the bar for the standard of wellbeing that GE animals are held to.

3. Establishing an Office Dedicated to Animal Welfare Interests at the FDA and USDA

Beyond updates to the USDA organic standards or FDA guidance documents concerning IGAs, additional steps could be taken at both agencies to give more weight to farmed animal interests. Both organizations' websites include sections expressing their commitment to ensuring animal welfare, despite there being very few actual protections in place for farmed animals.[119] Due to the dual nature of the USDA to promote agricultural products and support U.S. agricultural industries, including the livestock industry, many animal advocates cite concerns about industry interests outweighing animal interests, due to a lack of codified protections for the latter.[120] If true protections of animal interests are to be achieved at agencies with these aims, it is imperative to establish offices at each agency dedicated to ensuring that animal interests, including the ability to avoid breeding practices which negatively affect their welfare, are given more consideration.[121] While concerns about industry capture and influence would remain, creating a group dedicated to persuading the FDA and USDA to enforce greater animal welfare policies would be beneficial.

4. Amendments to Federal Legislation: The HMSA and AWA

Perhaps the most ambitious legal intervention, yet decidedly the most impactful, would require amending the HMSA and the AWA to include farmed animals in their purview (including chickens and other birds raised for food), and to carve out additional regulations around acceptable breeding practices. The HMSA, for example, could be amended to require minimum slaughter ages for each species which would incentivize farmers to use slower-growing breeds. The AWA could also be amended to consider the welfare impacts of selective

[119] *See Animal Care*, Dep't of Agric. (2024), https://www.aphis.usda.gov/animal-care (last visited Mar. 9, 2025); *FDA's Role in Protecting Animal Health* (2024), https://www.fda.gov/animal-veterinary/animal-health-literacy/fdas-role-protecting-animal-health (last visited Mar. 9, 2025).

[120] Kitty Block & Sara Amundson, *USDA Secretary's Support for Factory Farming Cruelty is an Insult to Animals and Voters*, Humane Soc'y of the U.S. (2024), https://www.humanesociety.org/blog/vilsack-farm-bill-insults-animals-voters.

[121] Comment from Anthony Mitchell, FDA-2008-D-0394 (May 1, 2017), https://www.regulations.gov/comment/FDA-2008-D-0394-0339.

breeding, and, like potential state-level initiatives discussed above, draft regulations around how productive animals could be and what breeds could be bred. It could include an array of regulations aimed at addressing the harms which stem from productivity-focused breeding and attempt to prevent the most egregious harms caused. Both of these amendments would likely face a lot of industry opposition and would be the largest political lifts discussed thus far, but they could likely have the farthest-reaching impacts on addressing farmed animal welfare.

Conclusion

While animals have been selectively bred to better accommodate human desires for centuries, recent advances in technology have allowed for increasingly invasive methods of manipulation at a significant cost to the animals we manipulate. Human use and consumption of nonhuman animals has inevitably impacted both wild and domestic species, and while early methods of selective breeding may have more closely mirrored natural selection, breeding practices used in the agricultural industry today have been perverted to maximize production, efficiency, and profitability with no regard for the impacts on individual animals. Modern farmed animals have been bred to grow larger more quickly, produce more eggs, milk, and offspring, and generally do more with less.

The physical and emotional impacts of this quest for maximum profit and productivity implicate drastic physical impacts on individual animals, including, but not limited to, skeletal and mobility issues, heart and other organ failure, respiratory problems, decreased immune response and increased disease and bacterial infection incidence, and above all else, increased mortality and death. Emotionally, animals rendered immobile or suffering from disease become agitated and highly stressed, making them even more susceptible to infection and other complications, or decreasing their productivity and increasing the likelihood that they are disposed of by the industry. This physical and emotional harm is only exacerbated by the highly concentrated conditions animals are kept in on farms across the nation. While many of these problems could be solved by returning to the use of slower-growing breeds and more traditional methods of farming, the industry and federal agencies have instead opted to invest in biotechnology as a tool to sustain an ultimately unsustainable system. Promises of disease-resistant, less aggressive, and environmentally friendly farmed animals designed by scientists inserting foreign DNA into nonconsenting research subjects fail to respect the bodily integrity of the trillions of animals who will be raised for food in the United States in coming years. Recent

aims at improving farmed animal welfare by advocating for better living conditions on farms are admirable; but without regulated breeding that requires higher welfare breeds and bans the most egregious harms caused by profit-focused breeding, any positive welfare effects stemming from better living conditions will be nullified by the chronic and acute pain caused by the broken bodies that farmed animals are forcibly bred to inherit. Rather than bioengineering animals to better adapt to industrial animal agriculture, compromising their bodily integrity in the process, it is imperative that we prevent suffering at the root and take aim at ending the legality of breeding animals who will inherently suffer.

The History of the Norway Rat: What Cities Have Been Doing vs. What They Should Be Doing to Humanely Manage Populations

Blair Eagleson*

Introduction

In 1522, in Autun, France, "some" rats were charged with eating and destroying barley crops.[1] The court appointed Barthélemy de Chasseneuz to defend the rats.[2] At trial, when the rats failed to show, Chasseneuz argued that the rats had not been given adequate notice and that the summons addressed only "some" of the rats of the diocese when it should have been addressed to "all" of the rats.[3] The court ordered for a second summons to be addressed to all the local rats.[4] The rats failed to appear for the second time, but Chasseneuz successfully argued that the rats were spread out and that more time was needed for them to travel to court.[5] The proceedings were further delayed.[6] Unsurprisingly, the rats failed to appear in court the third time.[7] Instead of a procedural argument, Chasseneuz argued that the rats "were entitled to equal treatment under the law."[8] The rats needed to be guaranteed safe passage to the court, and requested the court to enjoin the plaintiffs to restrain their cats so the defendants were not frightened.[9] The plaintiffs objected to the argument,

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[1] J.B. MacKinnon, *In Defense of the Rat*, Sierra Club (Oct. 23, 2023), https://www.sierraclub.org/sierra/rats-and-why-to-love-them.

[2] William Ewald, *Comparative Jurisprudence (I): What Was It Like to Try A Rat?*, 143 U. Pa. L. Rev. 1889, 1898 (1995).

[3] *Id.*

[4] MacKinnon, *supra* note 1.

[5] *Id.*

[6] *Id.*

[7] MacKinnon, *supra* note 1.

[8] Ewald, *supra* note 2, at 1899.

[9] *Id.*

but the court found the defense reasonable.[10] Unable to settle on a fourth trial date, the court decided in favor of the rats by default.[11]

As evidenced in the Chasseneuz trial, the anti-rat view held by the public has persisted for centuries.[12] Rats are perceived as disease-ridden vermin that destroy property and live in filth.[13] They can cause severe damage to property, resulting in "billions of dollars in damage annually around the world."[14] With many cities seeing rising numbers in rat populations and a yearly ranking of the "rattiest cities" in the United States, demands for rat management by residents have increased.[15] These management methods, however, must consider the humaneness of the various management actions.[16]

In an effort to balance the need for public safety with humane mitigation efforts, this Note will analyze current methods to mitigate rat populations and propose a solution that cities should enact to help manage rat populations. Part I provides background information on Norway rats and the law, and explains how rats' biology enables them to adapt to various environments and what areas of the law rats are included under. Part II discusses several methods currently used to control rodent populations and the drawbacks to these methods. Part III analyzes the more humane solutions to rat management and concludes with what solutions cities should implement in order to care for animal welfare and public safety.

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[10] *Id.*

[11] MacKinnon, *supra* note 1.

[12] *See, e.g.*, MacKinnon, *supra* note 1.

[13] *Id.*

[14] Courtney Norris & Dorothy Hastings, *Rats Are on the Rise. Here's What Cities Are Doing About It*, PBS News Hour (Sept. 11, 2023, 5:23 PM), https://www.pbs.org/newshour/nation/rats-are-on-the-rise-heres-whats-cities-are-doing-about-it.

[15] *Oh, Rats! Chicago Tops Orkin's Rattiest Cities List for Ninth Consecutive Year*, ORKIN (Oct. 23, 2023), https://www.orkin.com/press-room/top-rodent-infested-cities-2023.

[16] *See* Inbal Ben-Ami Bartal et al., *Empathy and Pro-Social Behavior in Rats*, 334 Sci. AAAS 1427, 1427-30 (2011) (A study done on rats showed that rats have "empathetically motivated behavior." The test involved housing the rats in pairs for 2 weeks before conducting the test. One cagemate would be placed in a centrally located restrainer, and the other rat would be free. The freed rat could free the trapped rat by applying enough force to tip the restrainer door. Rats would not open an empty restrainer, nor did they open a restrainer with an object. The study also found that if there were two containers, one with a rat, and one with chocolate, the freed rat would open both restrainers and share the chocolate with the other rat.).

I. Norway Rats and the Law

Norway rats, commonly known as brown rats, arrived in North America as stowaways on ships.[17] Brown rats are native to China and Mongolia but quickly spread with the increase in global trade.[18] While rats have been around for thousands of years, brown rats were not introduced to North America until the 1750s.[19] As commensal rodents, Norway rats are dependent on human density to survive.[20] Rats are nocturnal, but when rat populations are dense, they may be active during the daytime.[21] They will eat any type of food and only need half an ounce of water daily.[22] Brown rats on the Pacific Coast can most likely trace their origins to Russia, while brown rats on the East Coast can be traced to Western Europe.[23]

The Norway rat manages to simultaneously hold identities as a pest, laboratory rat, and pet rat.[24] Rat exterminator for Queen Victoria, Jack Black both "destroyed" rats, as well as bred rats of different colors.[25] By the end of the nineteenth century, rats had the identity of "pest," as well as "pet."[26] This dual identity was also seen in literature.[27] Edgar Allen Poe wrote about rats to scare readers, while Beatrix Potter wrote about the tale of a rat in "Samuel Whiskers," and even dedicated her book to her pet rat.[28] The transition from "vermin" to lab rats also dates back to nineteenth-century in France.[29] With this transition, the "social identity" of rats advanced, as rats have been recognized for contributing significantly to the advancement of science.[30]

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[17] Robert Pierce II, *Controlling Rats*, Extension Univ. of Mo. (Oct. 2022), https://extension.missouri.edu/publications/g9446.

[18] Emily Puckett et al., *Global Population Divergence and Admixture of the Brown Rat (Rattus norvegicus)*, Royal Soc'y Publ'g (Oct. 26, 2016), https://royalsocietypublishing.org/doi/10.1098/rspb.2016.1762.

[19] *Id.*

[20] John Griffin, *What to Do About Conflicts with Rodents*, Just. Clearinghouse (Sept. 28, 2023), https://www.justiceclearinghouse.com/resource/what-to-do-about-conflicts-with-rodents/.

[21] Robert Timm, *Norway Rats*, Univ. of Neb.-Lincoln 105, 106 (July 1994), https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1004&context=icwdmhandbook.

[22] *Id.*

[23] Carl Zimmer, *How the Brown Rat Conquered New York City (and Every Other One, Too)*, N.Y. Times (Oct. 27, 2016), https://www.nytimes.com/2016/10/28/science/brown-rat-new-york-city.html.

[24] Birgitta Edelman, '*Rats Are People, Too!' Rat-Human Relations Re-Rated*, Anthropology Today 3 (June 2002), https://www.jstor.org/stable/3695213.

[25] *Id.* at 4.

[26] *Id.* at 5.

[27] *Id.*

[28] *Id.*

[29] *Id.*

[30] *Id.*

A. Biology of Rats

Understanding rats' biology and their environment can help regulators better manage rat populations.[31] The growth in cities' rat populations is most attributed to female rats having about four to six litters a year, averaging about twenty offspring a year.[32] Rats have high reproductive potential, as they can adapt very easily to their habitat and climate.[33] They become sexually mature at around six to eight weeks old.[34] Females and males will have multiple partners within a group.[35] Gestation will last between twenty-two and twenty-four days.[36] Eighteen hours after a female rat has given birth, she will go into estrus which enables high reproduction.[37]

Since rats have poor eyesight, they rely on their hearing, taste, and smell.[38] Their "main sensory input is touch from their facial whiskers… and [their] sense of smell."[39] Rats are able to move each whisker individually, allowing them to rely on their whiskers like humans rely on their hands.[40] Their keen sense of taste allows them to detect even small levels of contaminants in their food.[41] When rats are exposed to new foods, they will reduce their overall food intake.[42] They will then gradually sample the new food.[43] If there are no adverse reactions from the new food, the rats will begin to eat more of the new substance.[44]

Rats will choose where to live based on shelter, food, and water.[45] They will dig burrows to live in, which have extensive tunnels.[46] Hiding in the burrows also helps play a part in rats regulating their body temperatures.[47] Rats travel, on average, only about 100 to 150 feet daily from their home base.[48] They are able to memorize the locations of food,

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[31] Griffin, *supra* note 20.

[32] *See* Pierce II, *supra* note 17.

[33] Griffin, *supra* note 20.

[34] *Id.*

[35] *Id.*

[36] *Id.*

[37] *Id.*

[38] Pierce II, *supra* note 17.

[39] Klaudia Modlinska & Wojciech Pisula, *The Norway Rat, From an Obnoxious Pest to a Laboratory Pet* 3 eLIFE (2020) (citation omitted), https://pmc.ncbi.nlm.nih.gov/articles/PMC6968928/.

[40] Griffin, *supra* note 20.

[41] Timm, *supra* note 21, at 107.

[42] Modlinska & Pisula, *supra* note 39.

[43] *Id.*

[44] *Id.*

[45] *Id.*

[46] *Id.* at 2-3.

[47] *Id.*

[48] Griffin, *supra* note 20.

water, and shelter.[49] With their two large incisors, rats are able to chew through thick plastic, wood, and drywall.[50] Rats live in groups and can form colonies of "several hundred individuals."[51] Within these groups, rats will groom one another and sleep in huddles with each other.[52] The group foundation also provides rats the ability to learn from each other about food sources.[53] Rats will sniff the mouths and fur of another that has eaten which allows the other rats to develop food preferences.[54] Territories of rats are delineated with scent cues, and male rats will defend their territories from intruders.[55] Because brown rats are territorial, it not only helps the colony of rats, but it can also help humans in the long run.[56] Rats already living within cities reject any new rat arrivals at the port.[57] This means that the risk of new diseases entering with new rats is very unlikely.[58] However, rats already living within cities are still able to carry and transmit human disease.[59] Diseases such as the bubonic plague, salmonella, and leptospirosis have transferred from rats to humans.[60]

Despite rats being around humans for centuries, within the last few years, rats have had more of an appearance in peoples' everyday lives. Due to restaurants closing down during the COVID-19 pandemic, rats were forced to find food sources elsewhere.[61] This led to rats relocating closer to residential areas for their food.[62] The pandemic also led to a significant increase in households with companion animals.[63] Homes with pets are attractive to rats due to pet food being "highly aromatic" and pet waste containing vital nutrients.[64] When restaurants began to reopen, many offered only outdoor dining, creating easier paths to food for rats.[65] Furthermore, the warmer temperatures due to

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[49] *Id.*

[50] *Id.*

[51] Modlinksa & Pisula, *supra* note 39.

[52] *Id.*

[53] *Id.*

[54] *Id.*

[55] *Id.*

[56] Zimmer, *supra* note 23.

[57] *Id.*

[58] *Id.*

[59] *What to Do About Wild Rats*, Humane Soc'y of the U.S., https://www.humanesociety.org/resources/what-do-about-wild-rats (last visited Nov. 11, 2023).

[60] *Id.*

[61] Norris & Hastings, *supra* note 14.

[62] *Id.*

[63] Michael Parsons et al., *Rats and the COVID-19 Pandemic: Considering the Influence of Social Distancing on a Global Commensal Pest*, 7 J. Urb. Ecology 1, 2 (2021).

[64] *Id.*

[65] Will Peischel, *Rats to the Rescue: Could Pesky Rodents Finally Get New Yorkers Composting?*, Guardian (Sept. 16, 2022), https://www.theguardian.com/us-news/2022/sep/16/rats-new-york-citys-rodent-problem-compost-initiative.

climate change have led to longer reproductive months for rats, leading to higher populations.[66]

B. Legislation Regarding Rats

Rats, whether in the wild or in laboratory testing, are not protected by law.[67] The Animal Welfare Act excludes rats, meaning the federal regulation establishing basic welfare standards for the treatment of animals in research and testing does not apply to them.[68] Since rats are not protected by law, they can be controlled "with any pesticides registered by federal or state authorities…[or] by use of mechanical methods such as traps."[69]

State laws usually have sections about rats under their pest laws; however, mention of rodents can be found in various sections of state codes such as health and sanitation. Federal agencies such as the Environmental Protection Agency (EPA) and the Centers for Disease Control and Prevention (CDC) work with state health departments in order to provide the public with information regarding rodent management.[70] Within New York, various agencies like "the City Departments of Buildings, Housing Preservation & Development, and Sanitation" collaborate and enforce rodent legislation.[71] In November 2022, New York City's mayor signed four new bills into law targeting rats.[72] The Rat Action Plan establishes rat mitigation zones and requires annual reports on progress made in curbing the rat population.[73] One of the laws allows the Department of Sanitation to restrict the times for buildings to determine when their garbage bins are allowed to be placed on the street.[74] Another one of the four laws enables the Department of

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[66] Molly Taft, *Rats Love Climate Change*, Popular Sci. (Apr. 25, 2019), https://www.popsci.com/warmer-winter-nyc-rats-thrive/.

[67] *Mice and Rats*, Humane Soc'y of the U.S., https://www.humanesociety.org/animals/mice-and-rats#:~:text=Purpose%2Dbred%20mice%20and%20rats,of%20the%20Animal%20Welfare%20Act (last visited Nov. 18, 2023).

[68] Michael McFadden et al., *Animal Welfare Act: Excluded Animals*, 25 Animal L. Rev. 203, 214 (2019).

[69] Timm, *supra* note 21, at 109.

[70] *Which Governmental Agencies Are Involved in Rat and Mouse Control?*, EPA (June 3, 2024), https://www.epa.gov/rodenticides/which-governmental-agencies-are-involved-rat-and-mouse-control.

[71] Jennifer González, *The New York City Rat's Legal History*, The Libr. of Cong. (Nov. 17, 2023), https://blogs.loc.gov/law/2023/11/the-new-york-city-rats-legal-history/.

[72] Erica Byfield, *NYC War on Rats: Can 4 New Rodent Laws Fix the Crisis?*, NBC N.Y. (Nov. 18, 2022), https://www.nbcnewyork.com/news/local/nyc-war-on-rats-can-4-new-rodent-laws-fix-the-crisis/3963953/.

[73] *Id.*

[74] *Id.*

Sanitation to require buildings that have received rodent violations to use specific containers that are rodent resistant.[75] In addition to these laws, New York City's mayor created a new role known as the "Rat Czar."[76] The Rat Czar is responsible for coordinating across agencies and organizations to reduce the rat population.[77] With this new appointment, the city also invested 3.5 million dollars into mitigation efforts just in Harlem.[78] These efforts include hiring full-time staff to inspect and maintain spaces to prevent "mischiefs" of rats, as well as new "rat slabs" that harden floors to prevent rats from burrowing.[79]

II. Methods Used to Manage Populations

The methods used to curtail rat populations can vary depending on the scope of the rat "issue." Well-known methods such as snap traps, electric shock traps, and glue boards have largely been used by people in their homes.[80] Public spaces may implement traps, but also use measures such as bait stations, rodenticides, and fumigants.[81] Effective, long-term management requires the integration of several methods.[82] Traditional methods have been developed to try to rectify the problem without considering the humaneness or the potential harm to unintended victims.

A. Inhumane Use of Glue Boards

People have turned to glue boards (also known as glue traps) as an alternative to snap traps.[83] The board is usually covered with a sticky adhesive that will trap the rat.[84] These traps are easily accessible, relatively inexpensive, and simple to use.[85] In contrast to glue boards,

[75] González, *supra* note 71.

[76] *Mayor Adams Anoints Kathleen Corradi as NYC's First-Ever 'Rat Czar'*, NYC (Apr. 12, 2023), https://www.nyc.gov/office-of-the-mayor/news/249-23/mayor-adams-anoints-kathleen-corradi-nyc-s-first-ever-rat-czar-#/0.

[77] *Id.*

[78] *Id.*

[79] *Id.*

[80] Christin Perry, *How to Get Rid of Rodents*, Forbes (Apr. 18, 2023), https://www.forbes.com/home-improvement/pest-control/getting-rid-of-rodents/.

[81] Stephen Vantassel et al., *Controlling Rats*, Univ. of Neb.-Lincoln, https://wildlife.unl.edu/pdfs/controlling-rats.pdf (last visited Apr. 21, 2025).

[82] *Id.*

[83] *Glue Boards*, Humane Soc'y of the U.S., https://www.humanesociety.org/resources/glue-boards#:~:text=Glue%20boards%20 (last visited Nov. 19, 2023).

[84] *Glue Traps: Pans of Pains*, PETA, https://www.peta.org/issues/wildlife/wildlife-factsheets/glue-traps/ (last visited Nov. 17, 2023).

[85] *Glue Traps vs. Snap Traps: How Are They Different?*, Midway Pest Mgmt., https://www.midwaypestmanagement.com/glue-traps-vs-snap-traps/ (last visited Apr. 21, 2025).

snap traps require people to dispose of the dead animal, reset it, and re-bait the trap.[86] Glue traps, however, are one of the most inhumane methods for rodent management.[87] Animals trapped in the glue will face a prolonged death.[88] In some situations, animals will bite off their limbs in an attempt to free themselves.[89] While the intended use of the glue trap is to eliminate rodents, other animals, such as birds, chipmunks, squirrels, and bats, can become trapped on the board.[90] Pets can become trapped as well, and if removed incorrectly, pets can lose their fur or skin.[91] The CDC advises against the use of glue traps.[92] Since rodents transmit diseases through their urine and feces, panicked animals trapped in the adhesive will defecate and urinate out of fear, putting anyone who handles the glue board at risk.[93] Several countries, such as Ireland, New Zealand, and Iceland, have outlawed the use of glue traps.[94] While the United States does not have any regulations on the use of glue traps, in April 2023, West Hollywood became the first city in the United States to prohibit the use and sale of glue traps.[95]

B. Rodenticides and Their Drawbacks

Rodenticides are pesticides that are used to kill rodents.[96] They can be classified into two categories: anticoagulants and non-anticoagulants.[97] Anticoagulants interfere with blood clotting, causing rats to bleed to death.[98] Because anticoagulants are slow-acting, rats may not show symptoms of poisoning for a few days.[99] Anticoagulants can be further classified as either first-generation or second-generation.[100] First-generation anticoagulants (FGARs) require multiple feedings, while second-generation anticoagulants (SGARs) require only a single

[86] *Id.*

[87] Griffin, *supra* note 20.

[88] *Glue Boards*, *supra* note 83.

[89] *Id.*

[90] *Glue Traps*, *supra* note 84.

[91] *Id.*

[92] *Glue Boards*, *supra* note 83.

[93] *Id.*

[94] *Id.*

[95] Noah Goldberg, *West Hollywood is First American City to Ban Rodent Glue Traps*, L.A. Times (Apr. 20, 2023, 11:19AM), https://www.latimes.com/california/story/2023-04-20/west-hollywood-is-first-american-city-to-ban-rodent-glue-traps.

[96] *Rodenticides*, Nat'l Pesticide Info. Ctr., http://npic.orst.edu/factsheets/rodenticides.html (last visited Jan. 17, 2025).

[97] Frederick Fishel, *Rodenticides*, IFAS Extension Univ. of Fla., https://edis.ifas.ufl.edu/publication/PI284.

[98] *See Rodent Control Pesticide Safety Review*, EPA (Nov. 18, 2024), https://www.epa.gov/rodenticides/rodent-control-pesticide-safety-review .

[99] Pierce II, *supra* note 17.

[100] *Rodenticides*, *supra* note 96.

feeding in order to kill.[101] Depending on the active ingredient, non-anticoagulants can have varying ways to affect the animal "such as neurotoxicity and renal failure."[102]

Rodenticides have been subject to many criticisms. They cause prolonged suffering for rats due to the length of time it takes to actually kill the rat.[103] Additionally, rodenticides can have harmful effects on animals that are not the intended target.[104] Rats will feed on the toxin several times before death, which will lead to carcasses containing lethal rodenticide residue.[105] Even if the toxin the rat is feeding on is a single dose, rats may still feed on the bait several times before the clotting factors run out, causing the rat to build up a very lethal dose in its body.[106] Predators that feed on these carcasses will inadvertently consume the toxin, causing harm.[107] Since rats are slowly dying from ingesting the poison, they become easier prey.[108]

In 2008, the EPA issued a risk mitigation decision for ten rodenticides, focusing on the reregistration eligibility of products and setting forth packaging requirements for these rodenticides.[109] The notice and comment period was opened in January 2007, and received over 700 comments to the proposed agency action.[110] Through registration and packaging requirements, the final action's two targets included minimizing exposure to children and non-target wildlife.[111] The risk mitigation decision limited bait products to be sold only in bait stations for general consumers, and put various controls on purchasing certain rodenticides that pose the greatest risks to wildlife.[112] In 2020, the EPA underwent its periodic review of pesticide registrations to ensure pesticides are satisfying the statutory standards, which require the pesticide to perform its intended function without adversely affecting "human health or the environment."[113] Part of the review requires the

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[101] *Id.*

[102] Lauren Vincent, *Raptors, Rats and Rodenticide*, U. of Ill. Coll. of Veterinary Med. Wildlife Med. Clinic (Nov. 19, 2021), https://www.vetmed.illinois.edu/hospital/wildlife-medical-clinic/wmc-blog/raptors-rats-and-rodenticide.

[103] Griffin, *supra* note 20.

[104] *Rodenticide*, MSPCA-Angell, https://www.mspca.org/animal_protection/rodenticides/ (last visited Jan. 27, 2025).

[105] *Rodent Control Pesticide Safety Review*, *supra* note 98.

[106] *Id.*

[107] *Id.*

[108] Nancy Lawson, *A Modern-day DDT?*, Humane World for Animals (Aug. 27, 2019), https://www.humanesociety.org/news/modern-day-ddt.

[109] *Rodent Control Pesticide Safety Review*, *supra* note 98.

[110] Rodenticides Final Risk Mitigation Decision; Notice of Availability, 73 Fed. Reg. 31868 (June 4, 2008).

[111] *Id.*

[112] *Id.*

[113] *Rodent Control Pesticide Safety Review*, *supra* note 98.

EPA to complete a thorough "draft human health and ecological risk assessments" for the listed pesticides in the notice.[114]

In November 2022, the EPA issued proposed interim decisions (PIDs) for rodenticides undergoing registration review.[115] These PIDs place restrictions on eleven rodenticides to help minimize the potential of exposure to vulnerable populations like children and pets.[116] With these restrictions, consumers are unable to purchase products that sell loose bait forms, nor can consumers purchase four pesticides (all second-generation coagulants) that have been deemed the greatest risk to non-target wildlife.[117] Loose bait can be in the form of blocks, pellets, or grain and is left out in the open.[118] This form of bait poses the largest issue of non-target poisoning as other mammals and birds are attracted to it.[119] In addition to limiting the sale of certain pesticides, the EPA also proposed measures that would ensure proper handling of pesticides.[120] These measures include requirements, like requiring occupational handlers to wear personal protective equipment when handling loose bait, searching for and collecting carcasses of animals in the location of the bait station, and requiring pesticide registrants to develop educational materials for product users.[121] The proposed interim decisions were open for public comment until February 2023.[122] Following public comment for the proposals, the EPA conducted a Biological Evaluation where it found that rodenticides were harming more than 130 endangered species and propelling seventy-three species toward extinction.[123] The Center for Biological Diversity noted:

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[114] *Id.*

[115] *Id.*

[116] *Id.*

[117] *Id.*

[118] *See, e.g.*, Stephen Vantassel et al., *Bait Stations for Controlling Rats and Mice*, Univ. of Neb.-Lincoln, https://extensionpubs.unl.edu/publication/g1646/na/html/view (last visited Mar. 9, 2025).

[119] Grant Jackson, *Rodenticides*, Or. Dep't of Agric, https://agsci.oregonstate.edu/sites/agscid7/files/ag-ed-sci/rodenticides1.pdf (last visited Feb. 23, 2025).

[120] *Rodent Control Pesticide Safety Review*, *supra* note 98.

[121] *Id.*

[122] *Id.*

[123] *EPA: Rat Poisons Pushing Dozens of Endangered Species Toward Extinction, Including Florida Panthers, California Condors*, Ctr. for Biological Diversity (Dec. 4, 2023), https://biologicaldiversity.org/w/news/press-releases/epa-rat-poisons-pushing-dozens-of-endangered-species-toward-extinction-including-florida-panthers-california-condors-2023-12-04/; *see* William Eckel et al., *Rodenticides. Draft Biological Evaluation, Effects Determinations, and Mitigation Strategy for Federally Listed and Proposed Endangered and Threatened Species and Designated and Proposed Critical Habitats*, EPA (Nov. 28, 2023), https://www.regulations.gov/document/EPA-HQ-OPP-2023-0567-0004.

> The EPA's proposals to limit the rodenticides' harms include requiring bait to be placed in tamper-resistant bait boxes to reduce unintentional ingestion by non-target animals; limiting use within the habitat of endangered species; limiting broad application of some loose rat poisons on agricultural fields; requiring that only licensed professionals apply certain types of rodenticides; and requiring users of the poisons to collect carcasses of poisoned rodents to avoid poisoning upper-level predators.[124]

The findings from the Biological Evaluation (BE) have led to the EPA building upon the 2022 proposed rodenticide measures. The BE was open for public comment until February 2024.

A group of Republican Senators have challenged the EPA's proposed rodenticide mitigation measures.[125] They argued in a letter to EPA Administrator Michael Regan that the restrictions on rodenticide would jeopardize "the ability of growers, consumers, pest control operators, restaurants, other food handling establishments, schools, health care facilities, and businesses to control rats."[126] The letter called for the agency to ensure that mitigation measures are science-based and practical and that the use of rodenticide be allowed to continue as an "essential" pest control tool.[127] The senators argued that the proposed mitigation measures would result in "crop damage and livestock loss… weaken public health protections, and make it more difficult for people to protect their homes and property from rodents."[128] The United States Department of Agriculture also wrote a comment on the EPA's proposed rodenticide measures, speaking out against the proposed ban.[129] The comment argued that "rodenticides remain crucial for protecting U.S. agriculture, public health, and the environment."[130]

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[124] Ctr. for Biological Diversity, *supra* note 123.

[125] Press Release, *Grassley, Hyde Smith, Colleagues Challenge Baseless EPA Rodenticide Restrictions*, Sen. Chuck Grassley (Oct. 17, 2023), https://www.grassley.senate.gov/news/news-releases/grassley-hyde-smith-colleagues-challenge-baseless-epa-rodenticide-restrictions.

[126] *Id.*

[127] *Id.*

[128] *Id.*

[129] *See* Kimberly Nesci, U.S. Dep't of Agric., *Comment on EPA's Proposed Rule for Pesticide Registration Review* (Feb. 13, 2023), https://www.grassley.senate.gov/imo/media/doc/usda_rodenticides_pid_comments.pdf (posted by Sen. Chuck Grassley).

[130] *Id.* at 2.

C. California and its Rodenticide Plans

In 2016, the city of Malibu, California, discontinued the use of all rodenticides and removed all baited traps.[131] The city has taken an approach of poison-free management after noting that thousands of animals have died because of rat poisons.[132] In December 2019, Malibu's City Council adopted a Local Coastal Program amendment placing a ban on all pesticides, not just rodenticides.[133] The California Department of Pesticide Regulation argued that Malibu was exceeding its authority and that the ban would be preempted by a state law that prohibited cities from banning state-regulated chemicals.[134] In May 2021, the California Coastal Commission approved Malibu's amendment to ban the use of rodenticides, herbicides, and pesticides within city limits.[135]

In 2020, California's Governor signed a bill placing a moratorium banning the use of second-generation anticoagulants.[136] In October 2023, the California Ecosystems Protection Act of 2023 was signed into law.[137] The bill restricts pesticides that contain the chemical diphacinone but contains exemptions for pesticide research, agricultural activities, and several other situations.[138] The act expands on the 2020 moratorium by placing a moratorium on the first-generation anticoagulant diphacinone.[139] Toxic rat poisons have been documented

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[131] *Rodent Control & The Environment*, City of Malibu, https://www.malibucity.org/750/Rodent-Control-the-Environment (last visited Nov. 18, 2023); *see also* City of Malibu LUP Land Use Plan Law, ch. 3, § C(1)(a), 3.18 (located at https://ecode360.com/44549778#44549778) (The "development that involves the use of pesticides, including…rodenticides or any other similar toxic chemical substances, shall be prohibited in cases where the application of such substances would have the potential to significantly degrade Environmentally Sensitive Habitat Areas or coastal water quality or harm wildlife.").

[132] *Id.*

[133] *Pesticide Ban*, City of Malibu, https://www.malibucity.org/1015/Pesticide-Ban (last visited Apr. 21, 2025).

[134] *See* Sonja Sharp, *Malibu Wants to Ban All Pesticides. The State of California Says That's Against the Law*, L.A. Times (Dec. 29, 2019), https://www.latimes.com/california/story/2019-12-29/malibu-rat-poison-wildlife-ordinance.

[135] *Id.*

[136] Belinda Messenger-Sikes & Niamh Quinn, *California Places Further Restrictions on Rodenticides*, Univ. of Cal. Agric. & Nat. Res. (Dec. 10, 2020), https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=44338.

[137] *See* Megan Fan Munce, *Newsome Signs Bills Restricting Use of Toxic Rat Poison*, S.F. Chron. (Oct. 14, 2023), https://www.sfchronicle.com/climate/article/newsom-signs-bill-restricting-use-toxic-rat-poison-18425536.php; *see also* 2023 California Assembly Bill No. 1322 (codified at Cal. Agric. Code § 12978.7 (West 2023).

[138] *Id.*

[139] *California Expands Toxic Rat Poison Ban*, Ctr. for Biological Diversity (Oct. 13, 2023), https://biologicaldiversity.org/w/news/press-releases/california-expands-toxic-rat-poison-ban-2023-10-13/#:~:text=The%20California%20

to unintentionally poison 38 different species in California, as well as 3,000 human poisonings in 2021.[140]

D. Rats Abroad

Increasing rat populations are not just occurring in the United States. Unlike the mayor of New York City, who made rats his number one public enemy, the mayor of Paris, France, announced a new approach to managing Paris's rat population by promoting coexistence with rodents.[141] This new plan departs from the one enacted in 2017, which saw Paris investing over a million euros into the "anti-rat plan," which consisted of installing "airtight trash bins…and extensive use of rat poison."[142] Rats were blamed for the bubonic plague that decimated Paris's population in the 1300s.[143] However, rats were welcomed in the late 1800s when Parisians used them as sources of food during the Siege of Paris.[144] Following garbage collector strikes that occurred in Paris in the spring of 2023, the rat population grew due to the uncollected waste.[145] The new rat management program involved forming a committee that would study ways for Parisians and rats to cohabitate peacefully.[146] This new plan has been dubbed "Project Armageddon."[147] The project's plan strives to assist in managing rat populations but also lists fighting prejudices against rats as one of its objectives.[148] While this proposal has drawn criticism from political opposition, animal welfare groups, like the Paris Animals Zoopolis (PAZ), have given their full support.[149] PAZ has even stated that rats are good for the city, as they help keep the city clean by eating several tons of waste per day.[150]

Ecosystems%20Protection%20Act,still%20on%20the%20market%20today.

[140] *Id.*

[141] Ator Hernandez-Morales, *Paris Needs to Learn to Live with Rats, Mayor Concedes*, POLITCO (June 9, 2023, 2:05 PM), https://www.politico.eu/article/paris-learn-live-rats-mayor-anne-hidalgo/.

[142] *Id.* (citation omitted).

[143] *Id.*

[144] *Id.*

[145] *Id.*

[146] *Id.*

[147] Haven Orecchio-Egresitz, *Rats Are Winning the Battle Against Cities. So Paris is Starting to Look at Cohabitation Instead*, Bus. Insider (June 11, 2023, 3:50 PM), https://www.businessinsider.com/can-humans-and-rates-just-live-together-paris-new-york-2023-6.

[148] Joshua Berlinger, *Can Humans and Rats Live Together? Paris is Trying to Find Out*, CNN Travel (June 10, 2023, 5:03 AM), https://www.cnn.com/travel/article/paris-rats-cohabitation-intl/index.html.

[149] David Andelamn, *Opinion: The City of Love Has a Plan for Its Rats*, CNN (June 15, 2023, 9:19 AM), https://www.cnn.com/2023/06/15/opinions/paris-rats-new-york-garbage-waste-cohabitation-andelman/index.html.

[150] *Id.*

In contrast to trying to cohabitate with rats, Alberta, Canada, has had no breeding population of rats in over seventy years.[151] Despite being the size of California and Oregon combined, Alberta is the largest location where humans live, but there are no rats.[152] Rats were first spotted at the border in 1950 on a farm.[153] Before rats arrived, the Agricultural Pests Act of Alberta was passed in 1942.[154] This act granted the Minister of Agriculture the authority to label any animal that would destroy crops or livestock as a pest.[155] Every person was instructed to destroy these designated pests to prevent their establishment.[156] Furthermore, under the act, where pest control was deemed inadequate, the government would carry out measures to destroy the pests and then "charge the costs to the landowner or municipality."[157] In 1950, rats were declared pests after people saw that rats were infiltrating farms and eating crops.[158] Alberta used pamphlets to educate the public on how to eliminate "rat harborages and food supplies," and tips for "the rat-proofing of buildings."[159] The government then, for several years, used arsenic tracking powder to treat buildings and farms in the mid-1950s.[160] Unsurprisingly, "non-target poisoning of livestock, poultry, and pets occurred."[161] Since Alberta is a large agricultural province, an amendment was added to the Agricultural Pests Act that required every municipality to appoint a pest control inspector.[162] Alberta also set up a Rat Control Zone along the border with Saskatchewan, which runs over 300 miles north to south and eighteen miles east to west.[163] At the start of the program in the 1950s, 250 control officers would patrol the area.[164] Today, there are only thirteen people needed to patrol this zone, where they will find "two to five infestations in over 300 miles of border."[165]

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[151] *History of Rat Control in Alberta*, Alta., https://www.alberta.ca/history-of-rat-control-in-alberta (last visited Feb. 20, 2025).

[152] *Must Be Rats on the Brain*, This Am. Life (June 9, 2023), https://www.thisamericanlife.org/801/must-be-rats-on-the-brain.

[153] *History of Rat Control in Alberta*, *supra* note 151.

[154] *Id.*

[155] *Id.*

[156] *Id.*

[157] *Id.*

[158] *Must Be Rats on the Brain*, *supra* note 152.

[159] *History of Rat Control in Alberta*, *supra* note 151.

[160] *Id.*

[161] *Id.*

[162] *Must Be Rats on the Brain*, *supra* note 152; *History of Rat Control in Alberta*, *supra* note 151.

[163] *Id.*

[164] *Must Be Rats on the Brain*, *supra* note 152.

[165] *Id.*

To achieve a mostly rat-free province, various enforcement actions have been implemented throughout the decades. The Agricultural Pests Act resulted in mandatory rat control.[166] If property owners did not control rats and disregarded warnings, they could be served with an official warning.[167] If owners failed to comply with the official warning, court action could be brought.[168] The potential court action has limited the number of notices to no more than seven in any year since 1956.[169] To keep Alberta rat-free, residents are to contact Alberta's rat control program when they see a rat.[170] It is also illegal to import or sell rats or to have them as pets within the province under the Agricultural Pests Act.[171] However, Alberta has recently been facing infestation at two recycling plants located in Calgary.[172] Although officials remain vigilant, modern commerce and travel have contributed to the increasing threat of rats coming into the province.[173] One thing that has helped Alberta in recent years manage the spread of rats has been the "death of the family farm."[174] With many family farms going out of business, the remaining farms are spread far apart.[175] The distance makes it difficult for rats to migrate to neighbors.[176]

While rat-free areas may seem appealing to some individuals, Alberta faces issues with other "pests." Like New York City's war against rats, Alberta has a war against what residents have dubbed "gophers," but what are actually "Richardson ground squirrels."[177] The ground squirrels are native to the area and will dig holes and eat grain found on farms.[178] While rats located in cities throughout the United States are a non-native species, the ground squirrel problem is too far gone to really curtail the population—a sentiment that many feel about rats.[179] Despite being the least favored group of wildlife based on public perception, rodents, like all animals and insects, play a critical role in

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[166] *History of Rat Control in Alberta*, *supra* note 151; Agricultural Pests Act, R.S.A 2000, c A-8 (Can.).

[167] *Id.*

[168] *Id.*

[169] *Id.*

[170] *Id.*

[171] *Id.*

[172] Alex Boyd, *Alberta is One of the Last "Rat-Free" Zones on Earth. Has There Been a Twist in the Tale?*, Toronto Star (Nov. 3, 2023, 6:40 PM), https://www.thestar.com/news/canada/alberta/alberta-is-one-of-the-last-rat-free-zones-on-earth-has-there-been-a/article_237411d9-81a4-5753-af89-022ee16e1c76.html.

[173] *Id.*

[174] *Must Be Rats on the Brain*, *supra* note 152.

[175] *Id.*

[176] *Id.*

[177] *Id.*

[178] *Id.*

[179] *Id.*

Earth's ecosystem.[180] They serve as an indispensable link in the food chain and can help propagate plants and disperse seeds.[181]

III. Solutions to Rat Management

Because rats are sentient beings, they deserve to be free from unnecessary pain and suffering. As adaptable creatures, rats have learned to live among humans.[182] Rats rely on the waste that humans create to support their population.[183] In order to see reductions in rat populations, it is necessary for humans to change their habits.

A. Curtailing Waste

The rat population is a reflection of human waste and lack of management. The United States is "one of the largest generators of municipal solid waste per person on a daily basis."[184] More than twelve percent of trash on the planet comes from the United States, despite only four percent of the world's population residing here.[185] In 2021, ReFED estimated that the United States produced ninety-one million tons of surplus food.[186] Almost forty percent of the total food supply was uneaten, which is valued at around $444 billion dollars.[187] Food waste also contributes to climate change, which in turn extends the reproductive periods for rats.[188] ReFED estimated that the surplus from 2021 contributed to six percent of total U.S. greenhouse gas emissions.[189]

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[180] Abi Gazzard et al., *In Defence of Rodents – Why Healthy Ecosystems Need Them*, Conversation (Jan. 3, 2023, 6:55 AM), https://theconversation.com/in-defence-of-rodents-why-healthy-ecosystems-need-them-196406#:~:text=Nonetheless%2C%20from%20the%203g%20desert,are%20a%20remarkably%20diverse%20bunch.&text=This%20diversity%20allows%20rodents%20to,eating%20and%20dispersing%20their%20seeds.

[181] *Id.*

[182] *What to Do About Wild Rats*, *supra* note 59.

[183] *Id.*

[184] *Wastes*, EPA, https://www.epa.gov/report-environment/wastes (last visited Nov. 12, 2023).

[185] *Trash in America*, Env't Am. (Sept. 29, 2021), https://environmentamerica.org/center/resources/trash-in-america-2/.

[186] Deena Shanker, *New Data Shows US Food Waste Is Getting Worse*, Bloomberg (Apr. 30, 2023, 6:30 AM), https://www.bloomberg.com/news/articles/2023-04-20/the-us-has-a-food-waste-problem-and-it-s-getting-worse.

[187] *Id.*

[188] Camille Fine & Javier Zarracina, *How Bad is Food Waste in the US? New Study Reveals Problem and What You Can Do*, USA Today (Nov. 13, 2023, 9:15 PM), https://www.usatoday.com/story/news/nation/2023/11/13/food-waste-united-states-climate-change/71537256007/.

[189] Shanker, *supra* note 186.

In Baltimore, authorities designated an area where there were strict sanitary conditions to follow, but no rodenticides were to be used.[190] Officers enforced regulations on proper waste storage, leading to the removal of old cars, fences, and trash, after which authorities observed the rat population virtually vanished.[191] The program, however, was not sustained because of "political and personal will to maintain environmental standards."[192]

Some cities have started to focus their rat control initiatives by switching the way trash is handled.[193] New York City advises that the best way to keep rats out of restaurants is to properly manage garbage.[194] New York has implemented trash collection times that will help prevent trash from sitting out for extended periods.[195] In its Hamilton Heights Containerization Pilot program, trash collection increased to six days per week.[196] Residents are advised to bag their trash and place it into shared bins.[197] Additionally, "food-related businesses" are required to use secured containers instead of trash bags.[198] Meanwhile in Washington, D.C., the 2024 fiscal year budget has allocated over three million dollars to replace trash bins with newer and larger ones.[199]

The switch from metal cans to plastic bags in the 1960s was a pivotal moment in New York rat population history.[200] With plastic bags being mass-produced, New York City's mayor implemented an experimental program that involved residents leaving trash bags directly on the curb.[201] The hope was that garbage bags would "reduce noise, odor, litter, speed up garbage collection, and improve conditions for sanitation

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[190] Gabriela Jarzebowska, *Prevention or Poisoning? Dilemmas in Urban Rat Control*, Arcadia (2017), https://www.environmentandsociety.org/arcadia/prevention-or-poisoning-dilemmas-urban-rat-control.

[191] *Id.*

[192] *Id.*

[193] *See generally Rat Prevention: Food Service Establishments*, N.Y.C. Dep't of Health & Mental Hygiene: Permits & Licenses, https://www.nyc.gov/site/doh/business/permits-and-licenses/rats-business-owner.page (last visited Nov. 15, 2023).

[194] *Id.*

[195] *See generally Hamilton Heights Containerization*, N.Y.C. Dep't of Sanitation, https://www.nyc.gov/site/dsny/collection/containerization/hamilton-heights-bins.page (last visited Feb. 1, 2025).

[196] *Id.*

[197] *Id.*

[198] *Following 21,510 Warnings in a Single Month, ALL Food-Related Businesses Can Face Fines for Failure to Containerize Trash Starting TOMORROW, 9/1/*23, N.Y.C. Dep't of Sanitation (Aug. 31, 2023), https://www.nyc.gov/site/dsny/news/014-23/following-21-510-warnings-single-month-all-food-related-businesses-can-face-fines-failure.

[199] Norris & Hastings, *supra* note 14.

[200] *Must Be Rats on the Brain*, *supra* note 151.

[201] *Id.*

workers."[202] With the efficiency of sanitation workers improving, New York's city council unanimously approved the use of plastic bags throughout the city.[203] Before the use of plastic bags, rats were found in only eleven percent of New York.[204] Today, rats are estimated to be in about eighty to ninety percent of the city.[205] New York City's mayor is currently working to undo what was started in the 1960s.[206]

On March 1, 2024, every New York business was required to begin placing trash in secure containers.[207] Commercial trash accounts for about twenty million pounds of waste every day.[208] In this phase, businesses will be granted flexibility in what type of container to use, as long as it has a lid and secured sides.[209] This targeted approach will cover half of all trash in all five boroughs.[210] As the containerization goal expands to eventually include residents, it will likely cause more parking struggles within the city.[211] Placing containers throughout the city could result in up to twenty-five percent of street parking being eliminated.[212]

In addition to the efforts to containerize trash, New York's rat "problem" has led to the passage of the Zero Waste Act in June 2023 by the New York City Council.[213] The Act includes five bills that aim to divert organic waste from landfills and create a greener future for the city.[214] Advocates for composting were able to capitalize on New Yorkers' aversion to rats by promoting the idea that taking organic waste and putting it into compostable, rat-proof bins would not only help keep the materials out of landfills but also away from rats.[215] Introduction 244-A requires residents to separate yard and organic waste for weekly collection, as

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[202] *Id.*

[203] *Id.*

[204] *Id.*

[205] *Id.*

[206] Press Release, *Mayor Adams, Sanitation Commissioner Tisch Announce Next Phase of War on Rats: All Businesses Must Place Trash in Containers*, Off. of the Mayor, City of N.Y. (Sept. 19, 2023), https://www.nyc.gov/office-of-the-mayor/news/680-23/mayor-adams-sanitation-commissioner-tisch-next-phase-war-rats-all-businesses-must#/0.

[207] *Id.*

[208] *Id.*

[209] *Id.*

[210] *Id.*

[211] James Barron, *Trash, Rats and Parking; What to Do?*, N.Y. Times: N.Y. Today (May 4, 2023), https://www.nytimes.com/2023/05/04/nyregion/trash-rats-and-parking-what-to-do.html.

[212] *Id.*

[213] Bob Gaetjens, *NYC Council Passes Bills Aimed at Zero-Waste Future*, Recycling Today (June 13, 2023), https://www.recyclingtoday.com/news/new-york-city-zero-waste-act-council-dsny-curbside-organics/.

[214] *Id.*

[215] Peischel, *supra* note 65.

well as require city officials to conduct outreach.[216] Introduction 274-A establishes "a goal of zero divertible waste" by 2030.[217] Introduction 275-A requires the New York City Department of Sanitation (DSNY) to report on its efforts to divert waste and provide specifics regarding materials recyclability.[218] The fourth bill, Introduction 280-B, requires DSNY "to establish community recycling centers in every borough and to collect materials that are not collected through regular curbside collection but that can be recycled or reused."[219] Under the final bill, Introduction 281-B, a minimum number of drop-off sites for organic waste would be established citywide by DSNY.[220] Environmentalists have advocated composting as an anti-rat measure for some time.[221] For these bills to succeed, public participation is necessary.[222] If enough people participate, the product created from recycling could offset the costs of landfill dumping.[223] It is possible, however, that rat populations could increase from composting measures.[224] An effective composting program needs to consider the location of the bin, the materials made to construct the bin, and limit what food items are allowed for compost.[225]

B. Future of Rat Management

Localities that struggle with rats should take an Integrated Pest Management (IPM) approach. IPM relies on common-sense practices mixed with science.[226] This tactic centers around an environmentally sensitive approach in which the management of "pests" is accomplished through monitoring the life cycles of "pests" and studying the way they interact with their environment.[227] The EPA recommends following a four-tiered approach: 1) set action thresholds, 2) monitor and identify pests, 3) prevention, and 4) control.[228] An action threshold usually

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[216] *Id.*

[217] *Id.*

[218] *Id.*

[219] *Id.*

[220] *Id.*

[221] Peischel, *supra* note 65.

[222] *Id.*

[223] *Id.*

[224] Michael Parsons, *To Beat Rats, Follow the Science*, Vital City (Mar. 23, 2023), https://www.vitalcitynyc.org/articles/rat-control-in-urban-environments.

[225] Ellen Harrison & Jean Bonhotal, *Preventing Animal Nuisances*, Cornell Waste Mgmt Inst. (2005), https://ecommons.cornell.edu/server/api/core/bitstreams/04a1239a-6965-4dfd-91be-a7cd83ef39d3/content.

[226] *Integrated Pest Management (IPM) Principles*, EPA, https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles (last visited Nov. 15, 2023).

[227] *Id.*

[228] *Id.*

requires more than just one sighting of a "pest" and instead encourages levels to be set when there is an economic threat.[229] Monitoring is required to know what type of actions need to be taken and where the problem is occurring.[230] Prevention should be the first step taken, as eliminating the risk of a problem is most effective and cost-efficient.[231] When control is needed, the least risky control options should be selected first, and if these methods are not sufficient, additional control methods should be employed.[232]

By interrupting the food supply, rat population numbers will decrease.[233] Many people feed rats inadvertently, such as dropping food onto streets, or throwing uneaten food on top of the trash bin.[234] By targeting the habits of people, the rats will be forced to locate food elsewhere.[235] The lack of effective rat management in cities has led to residents taking matters into their own hands. In Washington, D.C., community members formed a group known as "The Ratscallions."[236] The group goes around D.C. at night with their dogs to hunt for rats.[237] After the dog finds a rat and shakes it or crushes it to death, the owners collect the rat bodies in a garbage bag.[238] Although the D.C. Health Department does not support or endorse the practice, many restaurant owners encourage the group.[239] While the city does not provide business and private property owners rat-abatement measures, workers will address reports of an outdoor infestation.[240] D.C. Health will fill the burrows with carbon monoxide to suffocate the rats and will spray poisonous tracking powder so when the rats groom themselves, the powder on the fur will be ingested.[241] Animal welfare groups have called the dog hunting practice "barbaric."[242] Under D.C. Code in § 8–1808, "an owner or custodian of a dog shall not direct, encourage, cause, allow, aid, or assist that dog to threaten, charge, bite, or attack a person or

[229] *Id.*

[230] *Id.*

[231] *Id.*

[232] *Id.*

[233] Michael Parsons et al., *Better Rat Control in Cities Starts by Changing Human Behavior*, Conversation (Feb. 25, 2020, 8:54 AM), https://theconversation.com/better-rat-control-in-cities-starts-by-changing-human-behavior-129232.

[234] *Id.*

[235] *Id.*

[236] Maura Judkis & Jabin Botsford, *Washington is Full of Rats. These Dogs Are Happy to Help with That.*, Wash. Post (Sept. 13, 2023, 7:00 AM), https://www.washingtonpost.com/lifestyle/interactive/2023/rat-hunters-dc-dogs/.

[237] *Id.*

[238] *Id.*

[239] *Id.*

[240] *Id.*

[241] *Id.*

[242] *Id.*

other animal."[243] The Ratscallions are, therefore, in violation of the code, as the code protects even rodents from being targets of dog attacks.[244] Penalties for violation of this D.C. code range from $500 to $1,000.[245]

Washington, D.C. is not the only city to have its residents use their dogs as ways to curb the rat population. The group "Rats" has been using their dogs to hunt rats in New York since 1995.[246] Similar to D.C., the use of these dogs to hunt rats violates New York's anti-cruelty law.[247] Despite this measure being illegal, in 2017, a New York City councilman presented twelve dogs that were part of this group with "Vigilante Awards."[248]

Organizations like the Humane Rescue Alliance (HRA) and People for the Ethical Treatment of Animals (PETA) have spoken out against the practice. PETA has noted that "[r]ats are simply trying to eke out an existence like other New Yorkers."[249] HRA has expressed that killing rodents in this manner is "animal cruelty and extremely inhumane."[250] HRA has a program that uses feral cats to roam the streets in order to deter rats from burrowing in the area.[251] The program, "Blue Collar Cats," uses cats that have had little human interaction and therefore would not be ideal adoption candidates.[252] The program provides outdoor cats an opportunity to patrol for rats.[253] Local businesses and homeowners who participate in the program are responsible for basic care, such as providing food, water, and shelter, but HRA will assist in introducing the cat to its new environment. The HRA encourages participation in this program as an alternative to toxic pesticides.[254]

The future of rat control will most likely rely heavily on contraceptives. The company Senestech makes a plant-based rat contraception product called Contrapest.[255] The approach is an alternative

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[243] D.C. Code § 8-1808 (2023).

[244] Judkis & Botsford, *supra* note 236.

[245] *Id.*

[246] Adam Gabbatt, *New York Has a Huge Rat Problem. These Vigilantes with Dogs Think They Can Fix It*, Guardian (Dec. 19, 2021, 2:00 PM), https://www.theguardian.com/us-news/2021/dec/19/new-york-city-rat-problem-vigilantes-with-dogs.

[247] *Id.*; *see* N.Y. Agric. & Mkts. L. § 353 (McKinney).

[248] *Id.*

[249] *Id.*

[250] Judkis & Botsford, *supra* note 236.

[251] *Id.*

[252] *Humane Rescue Alliance Announces Launch of Blue Collar Cats Program*, Humane Rescue All., https://www.humanerescuealliance.org/blog/posts/humane-rescue-alliance-announces-launch-of-blue-collar-cats-program (last visited Apr. 16, 2025).

[253] *Id.*

[254] *Id.*

[255] Lisa Abend, *Rat Infestations Are a Global Problem. Is Birth Control the*

to most pest control methods that are often reactive.[256] Contrapest contains two active ingredients: VCD and triptolide.[257] Triptolide can affect the reproductive ability of male and female rats, while VCD destroys ovarian follicles in rats.[258] The product can prevent rats from reproducing for forty-five days with each dose.[259] Contrapest is placed within bait boxes where the rats then drink it.[260] Because the product aims to not kill rats and must be consumed every forty-five days, it seemingly poses little to no risk to other non-target animals.[261] Some have referred to immuno-contraceptives as "putting a bandage on a cancer."[262] Another concern was the triptolide deriving from a rare Chinese vine plant that was difficult to find and unstable in travel.[263] Researchers at the University of Copenhagen have located the enzymes and genes that help produce triptolide, decoded the DNA, and then encoded it into the "genetic material of yeast."[264] This has enabled production of the substance to be completed in a faster and cheaper way.[265] In Denmark, and likely other places, rats have developed resistance to various poisons.[266] This promising new technology is likely to play a major role in balancing rat control with humane management.

C. Combining Methods for Effective Management

While rats have been estimated to cost the world's economy billions of dollars, studying rat behaviors will allow people to "realize that rat behaviors contribute less to infestations than do humans."[267] Cities should invest in implementing educational programs so residents can understand how to identify a rat burrow early on and take measures to humanely encourage the rats to relocate. Besides small holes in the ground, smudge marks, an ammonia smell, and "gnawed holes up to inches wide in baseboards or at doorframes," are signs that rats are

Solution?, Time (Mar. 27, 2023), https://time.com/6264623/rat-birth-control-poison-contrapest/.

[256] *Contrapest*, Senestech, https://senestech.com/contrapest/ (last visited Apr. 21, 2025).

[257] *Id.*

[258] *Id.*

[259] Abend, *supra* note 255.

[260] *Id.*

[261] *Id.*

[262] Parsons, *supra* note 233.

[263] *Contraception is the Future of Rat Control*, Ctr. for Synthetic Biology (Feb. 21, 2023), https://synbio.ku.dk/news/contraception-is-the-future-of-rat-control/.

[264] *Id.*

[265] *Id.*

[266] *Id.*

[267] Parsons, *supra* note 233.

present.[268] City officials should encourage residents to remove food, water and habitat sources in their homes in order to either prevent rats or lessen their presence.[269] Depending on whether people are looking to discourage, prevent, or eliminate rats, there are various actions that can be taken.[270] To discourage rats from visiting, limiting potential hiding places in shrubs or tall grass, removing bird feeders and bird baths at night, or cleaning up animal waste in yards can help deter rats.[271] To prevent rats, seal entry points and plug gaps with steel wool or copper mesh.[272] To encourage relocation, rats can be deterred by various scents.[273] While there are registered repellants like Varpel Rope, using natural methods such as spraying peppermint oil, lavender, and citronella, or sprinkling cinnamon near homes can help with long-term prevention.[274] Additionally, not feeding wild animals like birds, or dumping used cat litter into burrow holes can help evict rats.[275] Rats are attracted to places where they can hide, so eliminating debris and clutter inside and around buildings can help encourage them to find somewhere else to settle.[276]

In addition to educational programs, there needs to be a campaign to encourage cleaning-up of the area. Modeled after Earth Day celebrations, communities should organize a monthly clean-up day where residents can volunteer. To encourage a community wide-effort, businesses in the area can entice volunteerism with giveaways. Investment in rat-proof trash bins in neighborhoods that have the largest presence of rats, combined with methods such as immuno-contraceptives, will help reduce rat populations. The city's public trash receptors should not be opened and exposed on the top. Instead, receptors should be tall, made of metal, and have a small opening.[277]

The conduct of humans significantly shapes the behavior of rats. While measures taken will vary depending on the severity of the rat presence, using several methods at once can help with mitigation. Rodenticide should never be used as the first method, as the suffering

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[268] *What to Do About Wild Rats*, *supra* note 59.

[269] *Id.*

[270] *Humane Rodent Solutions*, Humane Soc'y Int'l, https://www.hsi.org/news-resources/humane-rodent-solutions/ (last visited Apr. 21, 2025).

[271] *Id.*

[272] *Id.*; *What to Do About Wild Rats*, *supra* note 59.

[273] *Id.*

[274] *Id.*

[275] *Id.*

[276] *Managing Rat and Mouse Pests*, Gov't of B.C. (Jan. 20, 2023), https://www2.gov.bc.ca/gov/content/environment/pesticides-pest-management/managing-pests/animals/rodents.

[277] Nick Garber, *Dozens of Rat-Fighting Trash Cans Arrive on East Side, Menin Says*, Patch (Nov. 4, 2022), https://patch.com/new-york/upper-east-side-nyc/dozens-rat-fighting-trash-cans-arrive-east-side-menin-says.

endured by the rat and the potential to poison other animals is unjust when there are alternatives. If rodenticides are employed, the least-toxic formulations should be selected, and no loose bait forms should be used. Officials can also encourage natural predators like hawks and owls to help manage populations by protecting their natural habitats or installing owl boxes.[278]

D. Why Rats Deserve Respect When Enacting Mitigation Methods

No killing of healthy animals can be humane, but efforts can ensure that methods used are less inhumane.[279] While the laboratory rat may seem vastly different than the rats seen in trash cans or in subway stations, they are both Norway rats.[280] The first mammal domesticated for research purposes, rats have made indispensable contributions to science.[281] Because rats have similar gene counterparts to humans, they have been used to contribute to "cardiovascular medicine, neural regeneration, wound healing, diabetes, transplantation, behavioral studies and space motion sickness research."[282] Additionally, rats' brain structure resembles elements of human brains, enabling them to be used to model some human behaviors.[283]

Rats are sentient beings, feeling pain, pleasure, and experiencing emotions ranging from joy to grief.[284] In the late 1990s, rats were discovered to be able to laugh.[285] Neuroscientists discovered while monitoring social play that rats laugh in "ultrasonic chirps" that humans are unable to hear.[286] Through tickling the rats, scientists found that this vocalization more than doubled when rats were tickled and that the rats bonded with their ticklers.[287] Rats have episodic memories, and are capable of reliving these memories.[288] They also have metacognition, allowing for them to plan how they will travel based on what information

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[278] *Managing Rat and Mouse Pests*, *supra* note 276.

[279] *See What to Do About Wild Rats*, *supra* note 59.

[280] Modlinska & Pisula, *supra* note 39.

[281] *Id.*; *Rats*, Univ. of Cambridge, https://www.cam.ac.uk/research/research-at-cambridge/animal-research/what-types-of-animal-do-we-use/rats#:~:text=Rats%20have%20also%20been%20widely,have%20counterparts%20in%20the%20rat (last visited Apr. 21, 2025).

[282] *Rats*, *supra* note 281.

[283] *Id.*

[284] Craig Herbst, *Reform the Animal Welfare Act: Recognize Animal Sentience and Protect All Animals Who Think, Feel, and Suffer*, 62 Washburn L.J. 61, 66 (2022).

[285] Kristin Andrews et al., *Rats Are Us*, AEON (Mar. 2, 2020), https://aeon.co/essays/why-dont-rats-get-the-same-ethical-protections-as-primates.

[286] *Id.*

[287] *Id.*

[288] *Id.*; Herbst, *supra* note 284, at 69.

they do and do not know.[289] They are able to trade with other rats various goods, be taught how to drive a vehicle, and play hide and seek with humans.[290] In addition to the earlier study regarding rat empathy, rats have been proven to help save a fellow drowning rat when they themselves have experienced being drenched in the past, displaying that rats empathize with "how the drowning rat feels."[291] Various species of rats are being trained to detect undetonated landmines and drugs.[292] The use of these African giant pouched rats for landmines enabled fields located in Cambodia to become landmine free, allowing for the fields to be used to grow crops without fear that a child or farmer will detonate a mine.[293] This same rodent is also being trained to sniff out tuberculosis, the second most fatal infectious disease in the world.[294]

Yet, despite their human-like characteristics, and their scientific contributions, rats are looked down upon by society.[295] They are given no protection under the Animal Welfare Act; therefore, not entitling them to protections of humane care and treatment.[296] "Rats are close enough to us to serve as models for human psychopathologies, but far enough to be outside of ethical concern."[297] Calling someone a "rat" implies an insult and is associated with negative traits.[298] We inherently value some animals more than others.[299] This can be seen by looking at animal protection laws both at the federal and state levels.[300] Laws protecting companion animals are more prevalent than laws protecting other animals, like farm animals.[301] The closeness of the relationship between the human and animal, therefore, matters when it comes to

[289] Herbst, *supra* note 284, at 90.

[290] Andrews et al., *supra* note 285.

[291] *Id.*

[292] *New at the Zoo: Norway Rats*, Smithsonian's Nat'l Zoo & Conservation Biology Inst. (Nov. 17, 2017), https://nationalzoo.si.edu/animals/news/new-zoo-norway-rats.

[293] Andrews et al., *supra* note 285.

[294] Katya Cengel, *Giant Rats Trained to Sniff Out Tuberculosis in Africa*, Nat'l Geographic (Oct. 19, 2023), https://education.nationalgeographic.org/resource/giant-rats-trained-sniff-out-tuberculosis-africa/.

[295] Andrews et al., *supra* note 285.

[296] Jane Kotzmann & Gisela Nip, *Bringing Animal Protection Legislation into Line with Its Purported Purposes: A Proposal for Equality Amongst Non-Human Animals*, 37 Pace Envt'l L. Rev. 247, 257 (2020).

[297] Andrews et al., *supra* note 285.

[298] *Rat*, Vocabularly.com, https://www.vocabulary.com/dictionary/rat#:~:text=These%20negative%20traits%20have%20led,%22betray%20or%20snitch%20on.%22 (last visited Mar. 5, 2024).

[299] Herbst, *supra* note 284.

[300] Kotzmann & Nip, *supra* note 296, at 249.

[301] *Id.*

providing protections for animals.[302] Rats have to overcome a reputation of being dirty creatures that spread disease in order to be considered worthy of respect.[303] Falling under "pest" in various state and city codes, when it comes to eradicating rats, people do not think twice.[304] But these sentient beings deserve to be treated humanely.

Conclusion

While rats are consistently blamed for many bad things, rats are empathetic and intelligent beings. They are clean creatures, grooming themselves, as well as keeping separate chambers in their burrow for eating, sleeping, and defecating. Their reputation for being dirty creatures is more so a reflection of the habitats that have been created by humans. Rats are only desired when providing groundbreaking science, but as sentient beings, they are still deserving of respect.

No place will truly be "pest-free." As evidenced in Alberta, Canada, while there are no rats, there are tens of thousands of Richardson ground squirrels digging holes and eating farm crops. More cities should look toward Paris's approach in achieving peaceful cohabitation with rats. By studying rats' behavior and movement, cities can learn how to effectively manage their populations. New York's mayor may seek to eliminate all rats, but this idea is not only unrealistic, it also overlooks the actual problem: people. To effectively manage rat populations, people should look introspectively. When larger amounts of waste are present, larger populations of rats follow suit. Rats are adaptable, smart creatures that can quickly learn to avoid bait boxes or snap traps. However, limiting their access to food sources will encourage them to relocate.

Cities seeking to use rodenticide as their main tool to curb rat problems underestimate the ability of rats to adapt. The harmful effects of rodenticide on rats and non-target wildlife, and the capability of rats to learn to avoid bait stations, makes the use of them suboptimal. Methods of mitigation can only be truly effective when setting up long-term plans. Short-term fixes will only lead to short-term results. By using a multi-tactic approach that is focused not on killing rats, but on making the area uninhabitable for them, rats will seek residence elsewhere.

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[302] *Id.*

[303] Kate Whannel, *Is It Time to Stop Hating the Rat?*, BBC News (Jan. 16, 2018), https://www.bbc.com/news/uk-42708127.

[304] Andrews et al., *supra* note 285.

Animal Abuse Propensity Evidence Should Have Presumptive Admissibility Against Defendants for Violent Acts

Yara J. Khalil*

Introduction

Imagine a criminal defendant, Daniel, is charged in 2023 with battery toward a human, Veronica. Daniel has a jury trial, and the prosecutor bringing the charges against Daniel decides to offer evidence that one year ago, Daniel threw a dog into a street with oncoming traffic, wounding the animal. Could the prosecutor offer evidence of Daniel's prior violence toward the dog in 2022 to assert that Daniel is a violent person and therefore must also have been violent toward Veronica on the day she was brutally beaten? Unless an exception applies to the general rule, the answer is no, the evidence of the prior violence toward an animal would not be admissible in criminal or civil trials.

The Federal Rules of Evidence have guided United States trial courts for almost five decades, for the most part accomplishing the goals of "increased certainty as to what the rules are, predictability, efficiency, and uniformity of result."[1] Although some of the federal evidentiary rules permit discretion on the part of trial judges and thus run counter to consistent results and uniformity in civil and criminal cases, the rules provide a generally comprehensive guideline as to which items of evidence should be admitted in the trial record and which items of evidence should be excluded.[2] Federal Rule of Evidence 404 prohibits attorneys from offering evidence of an individual's character, to prove the individual "acted in accordance with that trait at a particular time."[3] Propensity evidence, also commonly referred to as "character evidence"

* I could not have brought the idea for this Article to fruition without the passion for the Federal Rules of Evidence that Professor Phil Pucillo instilled in me, as well as his guidance, wisdom, and incredible support from beginning to end. My best friend and colleague Skylar Steel encouraged me to pursue the Animal and Natural Resource Law Review, and to believe in myself and my Article, and I am forever grateful. I am so thankful for Professor David Favre, the ANRLR journal as a whole, and Michigan State University College of Law for providing me with the resources, incredible education, and assistance to take this Article from a dream to a reality. Finally, I am eternally motivated and beholden to the incredible animals on this earth—I will always remember you in the work I do.

[1] Federal Rules of Evidence Manual § PT1.04 (2022).

[2] *Id*.

[3] George Fisher, Evidence 153 (Robert C. Clark et al. eds., 3d ed. 2013).

is typically prohibited from being offered at trial because of the risk of "unfair prejudice."[4] For instance, juries can be influenced by propensity evidence to believe that the defendant must be guilty or liable for the crime or tort at hand simply because the defendant possesses a negative character trait and has acted in accordance with it in the past.[5] Additionally, jury members at a trial may not feel they have enough evidence to convict an individual for the currently charged crime or allegation, but because this individual has acted in an unfavorable way in the past, the jury may wish to punish the individual as a precautionary measure.[6] Explained alternatively, a group of jurors may assume that by convicting a defendant who has a negative character trait, they are doing what is just either by punishing the defendant for his or her undesirable trait and past actions, or by preventing that individual from committing future crimes or torts.

Evidence that is evaluated for admissibility under many rules, including Rule 404, must be accompanied by a Rule 403 analysis.[7] Federal Rule of Evidence 403 prohibits evidence when its probative value is substantially outweighed by its danger of unfair prejudice, its danger of confusion amongst the jury with the legal issues at hand, and more.[8] The list provided in Federal Rule of Evidence 403 is not exhaustive, but provides insight to trial judges as to how they may discern between slightly probative and highly problematic evidence, as well as everything in between.[9] The Federal Rules of Evidence Manual further explains that "error will be found only if the trial judge's decision cannot be supported by reasonable argument."[10] Therefore, discretion is granted quite freely to trial judges to make the important decisions whether or not to allow certain classes of evidence, and they are not under any obligation to follow what other judges would do in their position or with the same case on their docket.[11] Federal guidelines for courts provide that in order for prior bad acts of a defendant to be introduced into evidence, "the evidence must have a proper evidentiary purpose…must be relevant…must not be more prejudicial than probative and…must be accompanied by a limiting instruction if requested."[12]

Fortunately, there are circumstances in which propensity evidence is admissible to aid prosecutors and plaintiffs' attorneys in proving to a

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[4] *Id.*

[5] *Id.*

[6] *Id.*

[7] Fed. R. Evid. 403.

[8] *Id.*

[9] *Id.*

[10] Federal Rules of Evidence Manual § 403.02 (2022).

[11] *Id.*

[12] David Eskew & Paul Murphy, *Propensity – Persuasion and Prejudice: A Look at "Other Acts" Evidence*, 47 Litig. 21, 23 (2021).

judge or jury that the specific defendant committed the charged crime, or is liable for the alleged act; this character evidence can be invaluable in convincing a judge or jury that this defendant is indeed guilty or liable for the act in question because of prior behavior.[13] Many of the exceptions to admission of character evidence are discussed in Part I of this Article, with a special focus on Federal Rules of Evidence 413, 414, and 415. This is because the proposed rule arising from this Article most similarly follows the congressional and scholarly reasoning behind the aforementioned rules. Furthermore, the existence of Federal Rules of Evidence 413, 414, and 415 logically demonstrate the feasibility of liberal presumptions of admissibility for certain kinds of propensity evidence in criminal and civil trials.

As this Article will explain in detail through case law, law journal articles, and psychiatric studies, violence and organized crime affiliation have a strong and predictable nexus with individuals who commit abusive acts against animals.[14] However, if an individual is charged with any sort of criminal or civil violent misdemeanor or felony, even including animal abuse, evidence that the individual has abused animals in the past is categorized as propensity evidence and typically is not admissible to prove the accused acted in accordance with that trait of violence.[15] In the introductory example, asserting that Daniel is guilty of criminal battery or an assaultive tort in court today, because he has abused an animal on another occasion in the past year, would generally be prohibited.[16]

The prohibition of character evidence under Federal Rule of Evidence 404 may seem counterintuitive to many, as certain behavior like violence toward animals is not common to all people, and is a particularly heinous act that only can be attributed to less than two percent of the population in the United States.[17] Therefore, judges and juries would presumably wish to know if an individual had a propensity for a behavior like animal abuse in their past, and if they were more likely to commit the charged crime at hand based on their character.

This Article proposes that character evidence of a defendant's propensity to commit animal abuse should typically be admissible against defendants in state and federal courts, in all criminal and civil cases involving allegations of acts of violence, whether between

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[13] Fed. R. Evid. 413; Fed. R. Evid. 414; Fed. R. Evid. 415.

[14] *See infra* notes 76-113 and accompanying text.

[15] Fed. R. Evid. 404.

[16] *Id.*

[17] Michael G. Vaughn et al., *Correlates of Cruelty to Animals in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions*, NIH Nat'l Libr. of Med. (May 20, 2009), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2792040/pdf/nihms114950.pdf.

domestic parties or unrelated parties, through the enactment of a new Federal Rule of Evidence, as well as through state statutes in all fifty states. Only half of the fifty states currently have "prior bad acts" statutes or "Pet Protective Order" laws that sometimes permit animal abuse propensity evidence to be admitted for *domestic* violent crimes or torts.[18] This reality creates a large gap in the law that prohibits adults and children who are victims of violent crimes or torts from achieving justice through successful trials; allowing animal abuse propensity evidence concerning past violent acts committed by the defendant only in domestic violence cases makes it more difficult for prosecutors to prove other categories of violent crime, sometimes in situations where the result boils down to a contest of the defendant's word against that of the victim's.

This proposed new rule is unique because currently, propensity animal abuse evidence is *sometimes* permitted to show the probativeness of a current domestic violence charge. However, this restriction disregards the significant documented evidence that ties violent crimes to animal abusers that occur outside of domestic relationships too. The proposed solution would encompass the very real probability that someone who has a propensity to commit animal abuse is more likely to have committed any violent act, and thus their propensity for animal abuse should be presumptively admissible if admission of the evidence passes a balancing test and is relevant under the judge's discretion, pursuant to Federal Rule of Evidence 403.

Only six out of the fifty states in the United States define animal abuse under their domestic violence statutes, and judges might allow it to be argued as evidence of a prior bad act to be admitted in domestic violence cases specifically.[19] Another way in which state judges can permit prior bad acts of animal abuse to be admitted in a domestic violence case is through states that legally include pets under domestic violence protection orders.[20]

However, only twenty-six states have "Pet Protective Order" laws.[21] These numbers illustrate how very few state courts allow animal

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[18] *Can Incidents of Prior Animal or Child Abuse be Admitted as a Prior Bad Act in a Domestic Violence Case?*, Nat'l Dist. Att'ys Ass'n, https://ndaa.org/wp-content/uploads/State-chart-animal-abuse-as-prior-dv-acts-June-2014.pdf (June 2014).

[19] *Id.* The six states which reference animal abuse in their domestic violence statutes are Arizona, Colorado, Florida, Hawaii, Indiana, Nevada, and Tennessee.

[20] *Id.*

[21] *Id.* These states are Arizona, Arkansas, California, Colorado, Connecticut, the District of Columbia, Hawaii, Illinois, Iowa, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Jersey, New York, North Carolina, Oklahoma, Oregon, Tennessee, Texas, Vermont, Virginia, Washington, and West Virginia. The United States territory of Puerto Rico is not included.

propensity evidence arguments to at least be made, and potentially admitted, in support of domestic violence cases, which does not even account for the other categories of violent crime that do not occur between domestic parties. [22]

There have been arguments made in favor of courts admitting animal abuse propensity evidence in domestic violence and child abuse cases.[23] These arguments additionally address murder and sexual assault cases that occur within the home as qualifying situations for admitting prior instances of animal abuse.[24] However, in light of the strong link between other violent crimes and animal abuse that occur *outside of* domestic relationships, there is a compelling need for animal abuse propensity evidence to have a strong presumption of admissibility in all violent criminal and civil cases.[25]

This Article first addresses permissible purposes allowing certain classes of evidence to be introduced at criminal and civil trials. It then examines the existing Federal Rules of Evidence created by United States Congress members that provide for liberal admission of sexual assault and child molestation propensity evidence in criminal and civil trials. Animal cruelty is then defined, and its multiple categories are briefly explored in order to understand the scope of propensity evidence that is relevant to this Article's proposal. A discussion of domestic violence as it relates to animal abusers follows, along with a section on violent crime and how it has been documented by the United States government. Finally, after insight into the topics of animal cruelty, domestic violence, and violent crime, the connection between animal cruelty and violent acts is thoroughly addressed, and a new Federal Rule of Evidence is proposed. The Article concludes by addressing safeguards for criminal and civil defendants charged with violent crimes, with an example of a limiting instruction a criminal or civil court might employ to a jury in a case that animal abuse propensity evidence is offered.

I. Exceptions to the General Ban on Propensity "Character" Evidence

Not all evidence that may suggest a person has a certain propensity is inadmissible in court to establish a connection between past behavior and a charged crime or alleged tort; if there is a permissible purpose "such as proving motive, opportunity, intent, preparation, plan, knowledge, identity, absence of mistake, or lack of accident," such evidence can

[22] *Id.*

[23] Angela Campbell, *The Admissibility of Evidence of Animal Abuse in Criminal Trials for Child and Domestic Abuse*, 43 B.C.L. Rev. 463 (2002).

[24] *Id.*

[25] *See infra* notes 82-113 and accompanying text.

potentially be admitted in the evidentiary record.[26] Furthermore, the listed purposes are not the only pathways for the evidence to be admitted—they are examples, and any other purpose besides proving character and acting in accordance with it are permissible.[27] Despite these exceptions to Federal Rule of Evidence 404, judges still have discretion to admit or refuse to admit the evidence.[28]

A. Federal Rule of Evidence 413

Federal Rule of Evidence 413 is but one propensity evidence rule that supersedes Federal Rule of Evidence 404(b)(1) in criminal trials. [29] In essence, it allows for the admission of "evidence that the defendant committed any other sexual assault" in criminal cases for sexual assault.[30] Congress has only set forth three federal evidentiary rules that are able to bypass the usual constraints on propensity or character evidence, and a justification for one of these rules (Federal Rule of Evidence 413) is that many times "there is no physical evidence that ties the defendant to the charged crime; often the jury must make a credibility determination between the victim and the defendant."[31]

The text of the Rule prescribes other important duties for the prosecution in a criminal case for sexual assault to follow as well, including proper notice to the defendant both substantively and temporally.[32] The Rule also defines what constitutes "sexual assault" under federal law, which makes it important that the structure of the proposed animal abuse propensity evidence rule includes within it a definition of "animal abuse" under federal law.[33] Rule 413 limits evidence of prior sexual assault committed by the defendant to cases where the defendant is charged with sexual assault; the evidence may not be used to prove other types of crimes.[34]

B. Federal Rule of Evidence 414

Federal Rule of Evidence 414 is the second evidentiary rule that Congress has enacted that allows a special category of evidence to bypass the usual strict rule against propensity evidence under Federal Rule of

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[26] Fisher, *supra* note 3, at 157.
[27] *Id.*
[28] *Id.* at 158.
[29] Fed. R. Evid. 413.
[30] *Id.*
[31] Federal Rules of Evidence Manual § 413.02 (2022).
[32] *Id.*
[33] *Id.*
[34] *Id.*

Evidence 404(b)(1).[35] The only substantive difference between Federal Rule of Evidence 413 and Rule 414 is that instead of granting judges the discretion for presumptive admissibility of sexual assault propensity evidence, Rule 414 permits evidence that a defendant committed child molestation in defendant's past as probative evidence of the defendant's propensity to have committed the charged crime of child molestation at trial.[36]

C. Federal Rule of Evidence 415

The final Federal Rule of Evidence which was enacted in order to overcome the typical prohibition of propensity evidence is Federal Rule of Evidence 415, which is for both prior sexual assaults and child molestation.[37] What makes Federal Rule of Evidence 415 unique from Rules 413 and 414 is simply that it applies the aforementioned propensity evidence of sexual assaults and child molestations to civil trials instead of criminal trials.[38]

D. Application of Federal Rules of Evidence 413, 414, and 415

Case law has emphasized the intuitive concept that a sexual interest in children is highly unusual, and this is one of the policy reasons from Congress for allowing child molestation propensity evidence under Rule 414.[39] Relatedly, the individuals who abuse animals and may have a propensity for animal abuse are also highly unusual, and this trait arguably does not exist in ordinary people.[40]

Federal Rule of Evidence 413 has been similarly applied in cases, where because a defendant was "accused of a sexual assault, the court [could] admit evidence that [the defendant] committed any other sexual assault."[41] The 2016 case of *United States v. Zamastil* from the U.S. Court of Appeals for the Ninth Circuit serves as a reassurance to those who are concerned for the prejudicial effect that animal abuse propensity evidence could have on criminal and civil defendants; it addresses the adequacy of jury instructions and how they can counter the potential prejudicial effect of evidence admitted under Rule 413.[42]

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[35] Fed. R. Evid. 414.
[36] Fed. R. Evid. 413; Fed. R. Evid. 414.
[37] Fed. R. Evid. 415.
[38] *Id.*
[39] United States v. Bentley, 475 F. Supp. 2d 852 (N.D. Iowa 2007).
[40] Vaughn et al., *supra* note 17.
[41] *See generally* United States v. Zamastil, 671 F. App'x 621 (9th Cir. 2016).
[42] *Id.*

II. Animal Abuse, Domestic Violence, and Violent Crime

The following sections delve into what animal abuse and cruelty consist of, how animal abuse can be a predictor of domestic violence, and how the commission of animal cruelty often times exists alongside a variety of violent crimes and torts in America.

A. Animal Cruelty

In the United States, domestic companion animals are typically protected against acts of cruelty by state legislation.[43] Due to the usual lack of protection for farm animals, animals affected by science experiments, and others, this Article will focus only on existing anti-cruelty legislation for animals.[44] It is important to first discuss what animal cruelty is so that courts may understand which prior acts toward animals would qualify for animal abuse propensity evidence.

In his comprehensive text on animal law, animal law scholar and professor David Favre explains that the definition of cruelty toward animals is ever-changing and depends upon "the attitudes, morals, and perspectives of society."[45] Favre describes the view of animal cruelty as "an act that a jury finds is beyond the boundary of socially or culturally acceptable conduct."[46] Each state defines animal cruelty in their statutes in their own way; Michigan for example, mentions the word "disfigure," while Virginia mentions the word "abandons," and California uses the word "mutilates."[47] Through Favre's research of United States animal anti-cruelty legislation and jurisprudence, he notes that the term "malicious," which is very frequently listed in the aforementioned statutes, has an anthropocentric lens of the human intention, and not the "effect on an animal."[48]

It becomes obvious through looking at the variations in state anti-cruelty legislation that animal abuse propensity evidence depends on the way that the prosecuting state views animal cruelty, but examples include "cockfighting," physically attacking a dog until it dies and disposing of it in a "plastic bag," stabbing a dog to death, and altering puppies' ears "without anesthesia."[49] Important to mention is Favre's

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[43] David S. Favre, Animal Law: Welfare, Interests, and Rights 191 (Rachel E. Barkow et al. eds., 3d ed. 2020).

[44] *Id.*

[45] *Id.* at 206.

[46] *Id.*

[47] *Id.* at 207.

[48] *Id.* at 211.

[49] *Id.* at 214-15.

explanation of defenses to allegations of animal cruelty, including self-defense in the case of an animal attack against a human.[50] Self-defense is considered appropriate by courts in multiple jurisdictions when the level of force used by the human is equivalent or similar to "the threat or danger" presented.[51] However, force against an animal after an attack "would be considered revenge," and does not qualify as a defense to an anti-cruelty animal statute.[52]

Another focus of cruelty against non-human animals is abandonment—where someone who has custody or ownership of an animal decides to physically leave the animal without care, with "predictable harm or suffering that will arise after the abandonment."[53] One other major category of cruelty towards animals is encompassed within "animal fighting," which is where humans derive entertainment value from observing animals attack one another after purposely placing those animals in those situations.[54]

All of the aforementioned methods in which humans abuse animals are severely limited by what are described as "exemptions" or "exceptions"; certain categories of animals that are utilized and sometimes killed for human sport and agriculture may technically be treated cruelly without any legal ramifications for humans.[55] However, there are at least statutory protections for animal welfare for certain categories of domestic animals as previously discussed, and the violation of these anti-cruelty statutes is the focus of this Article.

Researchers have focused on domestic violence and how often it is accompanied by acts of animal cruelty as intimidation tactics, whereas other offenders have separate issues such as addiction, uncontrollable anger, and more that cause them to harm animals.[56] Individuals studying predictive factors of animal cruelty have also documented data that shows "lower socioeconomic households" and men, more often than women, commit animal cruelty.[57] These factors explained through the aforementioned data can provide helpful sources to judges conducting Rule 403 balancing tests, in order to determine how probative animal abuse evidence is in a given case with a specific defendant.

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[50] *Id.* at 227.

[51] *Id.*

[52] *Id.*

[53] *Id.* at 230.

[54] *Id.* at 234.

[55] *Id.* at 231-32.

[56] Amber Ahern, *The Link Between Animal Cruelty and Violent Crime Victimization: An Assessment of the Lifetime Impact of Animal Cruelty on Secondary Victims*, Nova Se. Univ. 12 (2020), https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1322&context=fse_etd.

[57] *Id.*

B. Domestic Violence

The National Crime Victim Law Institute (NCVLI) explains how "the realities of intimate terrorism show that intimate partner violence is not an isolated act of abuse," and offers this conclusion based on scientific research in order to make the argument that prior bad acts of a defendant rightfully belong on the trial record when he or she is charged with domestic violence.[58] In fact, some state legislatures have enacted more liberal prior bad acts rules for domestic violence, because of its typical private nature, and are more open to receiving evidence of past domestic violence than the Federal Rules of Evidence are.[59] This decision by some states shows the feasibility of incorporating more liberal and protective exceptions to Rule 404(b)(1), even when the specific type of evidence is not included in federal guidelines. Furthermore, the NCVLI frames the approach of states that statutorily allow for prior bad acts of domestic violence as supportive of "victims' rights advocacy," which helps to advance the same argument on behalf of animals that are victims of cruelty.[60]

A little over a decade ago, in a Michigan Court of Appeals case, the court illustrated the probative value of domestic violence propensity evidence through the introduction of prior bad acts for a defendant who had abused women in the past and was charged with domestic violence at trial.[61] The court focused on specific state legislation that "a full and complete picture of a defendant's history" was the legislature's intent for supporting domestic violence victims at their trials.[62]

Admittedly, courts in states such as New York place the probative worth of animal cruelty evidence as indicative of charged domestic violence "because the aggression and bad acts are focused on one particular person, demonstrating the defendant's intent, motive, identity and absence of mistake or accident."[63] Similarly, in a 2017 Pennsylvania Superior Court case, multiple rapes and sexual assaults were alleged to have been inflicted on four children by the defendant, and the court admitted evidence of his prior cruelty towards animals in front of the children because it likely induced fear in them and even prevented them from reporting his conduct for many years.[64] This case

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[58] *When Bad Acts are Probative*, Nat'l Crime Victim L. Inst. 1, https://law.lclark.edu/live/files/25189-ncvli-newsletter---when-prior-bad-acts-are (Sept. 2017).

[59] *Id.* at 2-3.

[60] *Id.* at 4.

[61] People v. Cameron, 291 Mich. App. 599, 609-10 (Mich. Ct. App. 2011).

[62] *Id.* at 610.

[63] People v. Westerling, 852 N.Y.S.2d 429, 431 (N.Y. App. Div. 2008).

[64] *See generally* Commonwealth v. Yerger, 168 A.3d 319 (Pa. Super Ct. 2017).

serves as an example of how animal abuse can be used as an intimidation tactic not just for domestic violence but also domestic child molestation and sexual assault.

However, violence between humans does not only occur in domestic situations, and those who commit acts of cruelty towards animals, whether through abandonment, animal fighting, or other abusive actions, do not only do so to intimidate their relatives, spouses, or children—as demonstrated by the studies cited in this Article.[65] Therefore, there can still be immense probative value associated with a defendant's prior bad acts of animal cruelty outside of just domestic violence charges.

C. Violent Crime

Just seven years ago, the Federal Bureau of Investigation (FBI) began compiling animal abuse and related crimes into specific categories within its National Incident-Based Reporting System (NIBRS), utilized by law enforcement organizations throughout the country.[66] Prior to 2016, the FBI lumped all animal-abuse crimes together into a large category of "other offenses" without considering how the commission of animal abuse crimes relates to and is a predictor of other crimes committed by the very same individuals.[67] Therefore, judges may be able to consider the important data that emerges and is compiled by NIBRS in deciding whether or not to allow animal abuse propensity evidence for a certain individual, based on a plethora of factors like age, sex, race, and more.[68]

The FBI made its full transition to utilizing NIBRS as the main source of data collection at the beginning of 2021.[69] Five years ago, less than one-third of the United States population was represented in the data law enforcement agencies reported to NIBRS for crime data collection.[70] Fortunately, that number has jumped from 31% to 66% of the population "as of June 2022."[71]

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[65] *See infra* notes 82-113 and accompanying text.

[66] *Tracking Animal Cruelty – FBI Collecting Data on Crimes Against Animals*, FBI, https://www.fbi.gov/news/stories/-tracking-animal-cruelty (Feb. 1, 2016).

[67] *Id.*

[68] *Id.*

[69] *See 2019 National Incident-Based Reporting System – UCR Focuses on NIBRS and Other Tools to Make More Relevant Data Available to Users*, FBI, https://ucr.fbi.gov/nibrs/2019 (last visited Feb. 26, 2023).

[70] *Id.*

[71] *National Incident-Based Reporting System (NIBRS)*, Bureau of Just., https://bjs.ojp.gov/national-incident-based-reporting-system-nibrs (Aug. 2, 2022).

1. Federal NIBRS Data

The 2019 NIBRS data reveals that almost ten thousand animal cruelty offenses occurred during that year.[72] Federal data from the same year illustrates the breakdown of offenders reported for committing animal cruelty in the United States, with 9,453 total offenders, 7,916 individuals age eighteen or older, and 270 individuals younger than eighteen, or under the "Juvenile" category.[73] The remaining 1,267 offenders in 2019 reported to law enforcement agencies for committing acts of cruelty against animals fall into a category NIBRS classifies as "Unknown Age."[74]

The federal demographics of animal victims due to acts of animal cruelty are not measured by NIBRS, as animals are not considered victims of animal cruelty, but rather society is.[75] Therefore, this Article will not touch on the demographics of animal victims of violent crime. The most common age bracket of offenders reported for committing animal cruelty in 2019 was ages twenty-six to thirty, with about 13% of offenders' ages being unknown; therefore, the age of those individuals who commit animal cruelty can be an illuminating factor for law enforcement officials.[76] Although it is not completely clearcut because of the "Unknown Sex" category. It seems the breakdown of animal cruelty offenses where the sex is known to the reporting law enforcement agency illustrates about 36% of women committing acts of animal cruelty, and 54% percent of men committing acts of animal cruelty.[77]

When considering the matter through the lens of race, NIBRS is able to show data that a clear majority of animal cruelty offenders in the category "White" (62%) commit these acts.[78] Interestingly, NIBRS

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[72] *Incidents, Offenses, Victims, and Known Offenders by Offense Category, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/incidents_offenses_victims_and_known_offenders_by_offense_category_2019.pdf (last visited Feb. 26, 2023).

[73] *Offenders – Adult and Juvenile Age Category by Offense Category, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/offenders_adult_and_juvenile_age_category_by_offense_category_2019.pdf (last visited Feb. 26, 2023).

[74] *Id.*

[75] *National Incident-Based Reporting System – Data Tables*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/data-tables (last visited Feb. 26, 2023).

[76] *Offenders Age by Offense Category, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/offenders_age_by_offense_category_2019.pdf (last visited Feb. 26, 2023).

[77] *Offenders Sex by Offense Category, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/offenders_sex_by_offense_category_2019.pdf (last visited Feb. 26, 2023).

[78] *Offenders Race by Offense Category, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/offenders_race_by_offense_category_2019.pdf (last visited Feb. 26, 2023).

demonstrates that while half of all crimes in America in 2019 occurred in the "Highway, Road, Alley, Street, Sidewalk" category for location, most animal cruelty offenses (69%) occurred in the "Residence/Home" category.[79] This data certainly emphasizes the domestic nature of many animal cruelty crimes, but does not logically limit the commission of other violent crimes by the same person to within the home. Almost 62% of crimes against animals are committed between the hours of noon and midnight.[80]

Lamentably, NIBRS fails to request data from law enforcement agents that would disclose the number of acts of animal cruelty that also involve the use of a weapon in an offense, as well as the type of force used.[81] This variety of data could have been helpful in aiding courts with defendants accused of crimes involving animal cruelty when considering the probativeness of evidence of prior instances of animal abuse and whether to admit such evidence. Another drawback of NIBRS data collection is that while drug and alcohol *use* concurrent with offense commission is measured, drug and alcohol-related *offenses* and their correlation with specific types of crimes is not measured; knowing how often drug and alcohol-related crimes are committed during animal abuse offenses could only serve to provide yet another factor courts could consider when deciding whether to admit animal abuse propensity evidence for a particular defendant.[82]

2. The Nexus

Psychiatrists Daniel Hellman and Nathan Blackman elaborate on a triad of factors that are predictive for antisocial violent behavior, and one of the factors is cruelty to animals.[83] The link between future violent acts and past acts of animal cruelty is documented by psychiatrists

[79] *Crimes Against Society Offenses – Offense Category by Location, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/crimes_against_society_offenses_offense_category_by_location_2019.pdf (last visited Feb. 26, 2023).

[80] *Crimes Against Society Incidents – Offense Category by Time of Day, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/crimes_against_society_incidents_offense_category_by_time_of_day_2019.pdf (last visited Feb. 26, 2023).

[81] *Offenses Involving Weapon Use – Offense Category by Type of Weapon/Force Involved, 2019*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/pdfs/offenses_involving_weapon_use_off_cat_by_type_of_weapon_force_involved_2019.pdf (last visited Feb. 26, 2023).

[82] *National Incident-Based Reporting System – Data Tables*, FBI, https://ucr.fbi.gov/nibrs/2019/tables/data-tables (last visited Feb. 26, 2023).

[83] Daniel S. Hellman & Nathan Blackman, *Enuresis, Firesetting and Cruelty to Animals: A Triad Predictive of Adult Crime*, 122 Am. J. Psychiatry 1431, 1431 (Apr. 1, 2006).

who study individuals predisposed to violent behavior.[84] Behaviors predictive of an individual's likelihood to commit crimes in the future are enuresis, fire setting, and abuse of animals.[85] Enuresis occurs when a person persistently—and involuntarily—wets the bed past the age of fifteen.[86] Those children who collect flammable materials, create bombs, and set fire to all types of objects and structures can be said to engage in fire setting.[87] Finally, a child or individual who sets out to harm animals through causing its death, instigating animal fights, or torture in any capacity is abusing those animals.[88]

Doctors Hellman and Blackman examined eighty-four individuals who committed a range of violent and non-violent crimes.[89] The medical professionals were able to control for variables such as race and age, ensuring that they did not impact their research results.[90] Of those individuals who had enuresis, fire setting, and animal cruelty present in their lives, two-thirds of them committed violent crimes.[91] In the group of individuals who exhibited just one or two of the behaviors studied—for example, only animal cruelty and fire setting—56% of them "had committed aggressive crimes."[92]

Due to the work of psychiatrists who have connected animal cruelty and other factors to aggressive crimes through their research, it has become increasingly apparent that society has predictive factors to look out for in children and older individuals; it would be misleading to the point of deception to prevent civil and criminal trial jurors from being informed of a defendant's past animal abuse when it can be so predictive of the commission of future violent acts.

The U.S. government's current position on animal abuse, as well as every single state's position on animal abuse, provides rationale for the liberal admission of animal abuse propensity evidence.[93] As the Animal Legal Defense Fund (ALDF), which focuses on the promotion of animal welfare through the legal system, explained in a recent amicus brief, cruelty towards animals is a criminal offense in each of the fifty states, as well as at the federal level.[94] States like Virginia and Oregon have even acknowledged the immense similarity between animal cruelty offenses

[84] *Id.*
[85] *Id.*
[86] *Id.* at 1432.
[87] *Id.*
[88] *Id.*
[89] *Id.*
[90] *Id.* at 1433.
[91] *Id*. at 1432.
[92] *Id.*
[93] *See generally* Brief for Petitioner, United States v. Stevens, 559 U.S. 460 (2010) (No. 08-769), 2009 WL 1703212.
[94] *See generally* United States v. Stevens, 559 U.S. 460 (2010).

like dogfighting and "other organized criminal operations" through the creation of statutes that "make dogfighting a predicate offense."[95] The federal government has enacted a similar prohibition that carries with it a heavy punishment of "up to five years for each violation."[96]

Psychologists who study school shootings have pointed to the growing evidence that about 50% of individuals who commit school shooting offenses have also abused animals in their past.[97] For over fifty years, the FBI has analyzed countless case studies and determined that animal abuse can help them predict future violent crimes including, but not limited to, serial killing, mass murder, arson, serial rape, and sexual homicide.[98]

There are multiple studies showing just how predictive animal abuse offenses are of other types of violent crime; one such study showed a five-fold increase of violent offenses in adult individuals who committed acts of animal cruelty.[99] Additionally, one study that was conducted over a ten-year span and followed the offenses committed by juveniles during that decade-long period showed research that children who abuse animals are "more than twice as likely as others to be subsequently referred to juvenile authorities for a violent offense."[100] The FBI has found that almost half of the individuals who are imprisoned specifically for murder offenses have committed acts of cruelty against animals prior to their murder offenses.[101]

One form of animal abuse, dogfighting, is associated with other criminal activity including "gambling, the illegal possession of weapons or banned substances, and even prostitution," and the presence of a vulnerable population: children.[102] Importantly, in a hearing in support of federal legislation designed to protect dogs, two members of Congress testified that over a six month period, 100% of the dogfighting offenses recorded also involved the criminal offenses of "gambling and drug trafficking."[103]

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[95] *Id.* at 19.

[96] *Id.* at 22.

[97] Stephanie Verlinden *et al.*, *Risk Factors in School Shootings*, 20 Clinical Psych. Rev. 3, 39 (2000).

[98] Randall Lockwood, Animal Cruelty and Violence against Humans: Making the Connection, 5 Animal L. 81, 82 (1999).

[99] *Id.* at 32.

[100] *Id.*

[101] *Id.* at 34-35.

[102] Francesca Ortiz, *Making the Dogman Heel: Recommendations for Improving the Effectiveness of Dogfighting Laws*, 3 Stan. J. Animal L. & Pol'y 1, 6 (2010).

[103] *Id*. at 13, 44. There are studies also documenting a substantial connection between the commission of animal abuse crimes and non-violent crime, but this Article focuses only on violent crimes and making a policy argument for the admission of animal abuse propensity evidence for those violent crimes.

Specifically for the violent crime of aggravated assault, researchers have been able to illustrate that 60% of offenders also commit abuse towards animals.[104] With over half of the states requiring juvenile counseling post-animal abuse discovery, the rationale grows stronger for just how predictive animal abuse acts are of violent crimes and torts.[105] Other researchers have found that the amount of "battered women" in shelters who live with someone who commits cruelty against animals is 50% higher than for non-battered women in the same shelters.[106] Because animal abuse is often predictive of violent crimes occurring outside of domestic dynamics, such as school shootings, it should be presumptively permitted as propensity evidence in school massacre cases too.[107]

In *Shoultz v. State*, which is a domestic murder case from Indiana, the court rationalized that evidence of the defendant's cruelty towards animals on two prior occasions before murdering his father was admissible for a purpose other than to show the defendant had a propensity to commit murder.[108] Specifically, the defendant shot his girlfriend's mother's dog, and later one of his own dogs.[109] He then proceeded to shoot and kill his father within the same month.[110] It is also important to note that the defendant was a convicted violent felon, and unlawfully possessed the handgun with which he had shot his father.[111] In admitting the evidence of the defendant's prior animal abuse, the trial court was persuaded by the prosecution's argument that the evidence showed intent and motive, accompanied by testimony about "frequent conflicts between the parties [that] was relevant to show motive."[112] Importantly, the trial court conducted a Federal Rule of Evidence 403 balancing test in order to determine that the defendant's past abuse and killing of his own Pitbull was probative and appropriate for the jury to hear.[113] Furthermore, the court noted the relevance of the introduction of the animal abuse propensity evidence due to defense counsel putting into question a prosecution witness's assertion of fear from the defendant; the defendant had demanded that specific witness murder his dog and when she refused, he did it himself while she was present.[114]

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[104] *Id.*

[105] *Id.* at 47.

[106] *Id.* at 48.

[107] Arnold Arluke & Eric Madfis, *Animal Abuse as a Warning Sign of School Massacres: A Critique and Refinement*, 18 Homicide Stud. 7 (2014).

[108] Shoultz v. State, 995 N.E.2d 647 (Ind. Ct. App. 2013).

[109] *Id.* 652-53.

[110] *Id.*

[111] *Id.* at 653.

[112] *Id.* at 655.

[113] *Id.* at 656.

[114] *Id.*

While the Indiana trial court had appropriately allowed the evidence of prior animal abuse to be offered against the defendant as indicative of murdering his father, this Article argues it should not be necessary—either under the Federal Rules of Evidence, the Indiana Rules of Evidence, or the evidence rules of any other state—for the court or the prosecution to make the evidence argument for an acceptable purpose under Rule 404(b)(2). Especially in domestic violence and other types of violent crime cases with fact patterns like *Shoultz*, it would seem counterintuitive to prevent a jury or sitting judge from hearing past instances of animal cruelty committed by a defendant who is now charged with murder unless it fits a purpose other than to prove the defendant's character. It is highly relevant that the animal abuse committed by the defendant occurred so close in time and place to the murder of his father, but it is not a necessary aspect of the admissibility of the evidence.

Of course, motive, intent, absence of mistake, and other non-propensity purposes may neatly fit into a prosecutor's offer of proof of a defendant's prior animal abuse, and these outcomes can be beneficial for the judgment of the jury, judge, and society at large.[115] However, a more liberal presumption of admissibility for animal abuse propensity evidence in cases where a violent act is alleged seems rational when the connection between cruelty towards animals and the commission of future violent crimes and torts is considered. This notion of liberal admissibility for animal cruelty evidence can remove unnecessary appeals from trial court judgments because the judge's decision to allow animal abuse propensity evidence in the first place could not be as easily questioned unless there truly exists a major and substantial error in allowing it.

Studies illustrate how animal abusers are more likely to commit other violent crimes involving "battery, weapons, or drug offenses" and violence against humans outside of a domestic dynamic too.[116] Scholars have been able to reject hypotheses that diminish the connection between those who abuse animals in childhood and their teenage years and those who commit animal abuse in adulthood.[117] Animal abusers commit crimes like "rape, robbery, and assault" at a ratio of 5:1 compared to individuals who do not abuse animals.[118] This data is highly probative and useful beyond the typical domestic violence situation that is focused on when discussions of animal cruelty arise.

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[115] Fed. R. Evid. 404(b)(2).

[116] Sharon L. Nelson, *The Connection Between Animal Abuse and Family Violence: A Selected Annotated Bibliography*, 17 Animal L. 369, 373 (2011).

[117] *Id.* at 377.

[118] Kathleen Wilde, *Animal Law in Nevada: All Bark and No Bite*, 11 Nev. L.J. 254, 260-61 (2010).

The link between animal abuse and violence towards people outside of the abuser's home is supported by studies on sexual homicide, violent crimes, aggression crimes, rape and child molestation, assaultive women, incarcerated men, property crimes, and drug and disorderly conduct offenses.[119] Furthermore, the FBI has focused on and recruited individuals to specialize in profiling serial killers throughout the country, most of which have a history of animal abuse as children.[120] This abuse sometimes includes a history of domestic violence against the serial killer's siblings, but eventually proceeded outside of the home towards people in the general U.S. population.[121]

III. Propensity Evidence Could Cut the Nexus

Using Federal Rules of Evidence 413, 414, and 415 as a basis of understanding, animal abuse propensity evidence in criminal and civil cases alleging acts of violence on the part of the defendant should similarly supersede 404(b)(2) of the Federal Rules of Evidence with the presumption of admissibility, of course being subject to the typical balancing under Rule 403. The Rule 403 balancing analysis is suggested despite the fact that it is not explicitly applicable to Rules 413 through 415, because the proposed animal abuse propensity rule would not only be applied to cases where animal abuse is charged.[122] With Federal Rules of Evidence 413 through 415, the manual has been interpreted to allow for discretionary application of Rule 403 by judges in criminal and civil trials.[123] Therefore, an additional—and perhaps even mandatory Rule 403 analysis with the proposed rule—would act as a safeguard against the danger of undue prejudice to the defendant, and ensure the probative value of the past animal abuse incidents is not substantially outweighed by that danger.

When a court in a civil or criminal trial involving an allegation of a violent act is presented with animal abuse propensity evidence, it should consider the probative value of the evidence as to the crime or tort being charged. This evidence could be valuable in its relation to domestic violence, gambling, robbery, murder, aggravated assault, and any of the other connections to violent crimes that have been documented in recent research.[124] Judges should also consider the prejudicial components of the animal abuse propensity evidence, and whether a jury may choose to

[119] Cynthia Hodges, *The Link: Cruelty to Animals and Violence Towards People*, Animal L. & Hist. Ctr., https://www.animallaw.info/article/link-cruelty-animals-and-violence-towards-people (2008).

[120] *Id.*

[121] *Id.*

[122] Federal Rules of Evidence Manual § 413.02 (2022).

[123] *Id.*

[124] *See supra* notes 82 through 113 and accompanying text.

convict the defendant at hand, simply because the defendant has harmed animals in the past. For example, if a criminal defendant stands trial for murder, and there is evidence that the defendant has unjustifiably harmed or killed animals in the past and meets the suggested definitions of animal cruelty, the judge should consider that a jury empathetic to animals may retroactively punish the defendant for those past acts of animal cruelty and proactively punish the defendant in case the alleged charge is true.[125] If the judge feels that the jury may not be able to weigh the animal abuse propensity evidence as predictive of the crime at hand, and instead might collectively decide the defendant is simply a bad person and should be punished notwithstanding the charged crime, the judge may choose to prohibit the animal abuse propensity evidence from being placed in the record.[126]

It is important to remember that animal abuse propensity evidence in the proposed rule could still inflict some degree of unfair prejudice on a criminal or civil defendant who is charged with a separate violent act, without substantially constituting an error at the trial court level.[127] Still, unless the danger of unfair prejudice posed by the animal abuse propensity evidence would substantially outweigh the probative insight that it offers concerning the defendant's commission of a violent act, then it is not prohibited from coming into the trial court record.[128] It might be the case for a judge or members of a jury to feel negative emotions towards a defendant for committing cruel acts towards animals prior to the trial, but that they do not allow this to be the single-most or even a substantial factor in assigning guilt to the defendant, if at all.[129] Instead, making animal abuse propensity evidence available to the judge or the jury in a case involving a violent act ensures that all information that might be necessary to making an informed decision for assessing criminal guilt or civil liability is present and able to be utilized appropriately.

Trial judges might consider other factors relating to the defendant in the case at hand, such as presence of enuresis and fire setting in childhood, as well as the possibility of animal abuse as an intimidation tactic for other violent acts.[130] This Article does not suggest that trial court judges must become experts in the psychology of animal abuse and its predictive qualities for future commission of violent crimes, but rather asserts there are bountiful resources available to trial courts in determining whether evidence is truly probative when conducting Federal Rule of Evidence 403 analyses.

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[125] Fisher, *supra* note 3, at 153.

[126] *Id.*

[127] *Id.*

[128] *Id.*

[129] *Id.*

[130] *See generally* Hellman & Blackman, *supra* note 83. Ahern, *supra* note 56, at 12.

Another important decision a judge may choose to make when considering the admission of animal abuse propensity evidence against the defendant for a dissimilar charged crime or tort is providing the jury with a limiting instruction.[131] This limiting instruction would have the effect of reminding jurors to refrain from finding the defendant guilty or liable simply because they are repulsed by the defendant's history of animal abuse.[132] Rather, the instruction would guide jurors to consider the evidence and its documented connection to the violent act for which the defendant is accused of.[133] An example of a limiting jury instruction for animal abuse propensity evidence at a trial for a violent crime or tort might look like the following:

> **Limiting Jury Instructions for Other Crimes, Wrongs or Acts of Defendant Against Animals**
>
> Members of the jury, you have heard evidence today that the defendant committed other crimes, wrongs, and/or acts against animals not currently charged here. Specifically, you saw evidence today presented by the prosecution that the defendant Ms. Johnson beat a dog on January 3, 2021, two years before the alleged murder of her work colleague, charged against her here today. You also heard testimony from the prosecution's expert witness veterinarian, Doctor Smith, who testified that each time Defendant Johnson brought her cats to be medically treated in June, September, and December of 2022, there were substantial signs of starvation, beatings, and injuries in Defendant's animals. Finally, you saw video documentation of the defendant kicking and stepping on three different sheep at a petting zoo in front of her children two weeks before the murder of defendant's work colleague. You may consider this evidence you have heard only for its bearing, if any, on the question of the defendant's being more likely than not to have committed the charged crime here, and for no other purpose. You may not consider this evidence as evidence of partial or total guilt of the crime for which the defendant is now on trial. If you are unable to consider this evidence as separate from the charged

[131] *See* Fisher, *supra* note 3, at 153.
[132] *Id.*
[133] *Id.*

> crime of murder here today, and feel that you might unfairly determine the defendant is guilty simply because of past acts towards animals, you must notify the judge immediately.[134]

It would not be necessary for a judge in every case involving an allegation that the defendant committed a violent act to admit animal abuse propensity evidence simply because a federal or state rule recommended a liberal presumption of admissibility. If a presiding judge sees insufficient probative value in the animal abuse propensity evidence and was able to determine the potential for extreme risk and bias against the defendant, the judge could object to admission of the evidence, and thus would not be required to provide a limiting instruction like the one presented above.[135] The suggestion for a limiting instruction would be conditional upon admission of the propensity evidence, and serves only as a safeguard for defendants accused of violent crimes.[136]

Conclusion

This Article seeks to align the commission of animal abuse and cruelty crimes on the level of other heinous and revealing human acts. It is not the position of this Article that evidence of animal abuse propensity evidence is critical to providing a complete picture needed by a jury when confronted with deciding whether a criminal or civil defendant has committed an act of violence. Only certain human crimes and the inherent character in committing them should have a liberal presumption of admissibility in trial courts at the state and federal levels.[137] Just like sexual assault and child molestation, acts of animal abuse are extremely odious and unusual, and they are not committed by the average person in the United States population.[138] Therefore, they can be highly probative of an individual's character, especially when observed in relation to charged and future criminal or tortious conduct.[139] Evidence of this sort can be extremely helpful in securing justice for victims of abuse and assault, human and nonhuman, and lead to more comprehensive trial outcomes and subsequent justice.

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[134] Michael H. Simon et al., *2.12 Evidence for Limited Purpose – Manual of Model Criminal Jury Instructions*, U.S. Cts. for the 9th Cir., https://www.ce9.uscourts.gov/jury-instructions/sites/default/files/WPD/Criminal_Instructions_2022_12.pdf (Dec. 2020).

[135] Fed. R. Evid. 403.

[136] *See* Fisher, *supra* note 3.

[137] Fed. R. Evid. 413; Fed. R. Evid. 414; Fed. R. Evid. 415.

[138] Vaughn et al., *supra* note 17.

[139] *See supra* notes 82-113 and accompanying text.

The documented and insightful connection between those individuals who commit animal abuse and who later engage in the commission of violent acts should not be ignored in criminal trials.[140] The proposed rule in this Article can only enhance the criminal and civil justice system's understanding of violent criminals, the successful prosecution of defendants who harm humans and animals, and support the important animal abuse prohibition policies that every legislative body in the United States—state and federal—believes are crucial for a more just society.[141] Similar to Federal Rules of Evidence 413, 414, and 415, a newly enacted Federal Rule of Evidence should govern the liberal, favorable, and presumptive admission of animal abuse propensity evidence in trials for criminal and civil defendants accused of acts of violence.

[140] *Id.*

[141] *See generally* Brief for Petitioner, United States v. Stevens, 559 U.S. 460 (2010) (No. 08-769), 2009 WL 1703212.

Safeguarding Our Water: Recommendations for Amending the Great Lakes Compact

Abigail Stoll*

Introduction

The Great Lakes region is one of the most unique places on Earth. The five Great Lakes—Michigan, Superior, Huron, Erie, and Ontario—and their connecting waterways form the single largest watershed on the planet.[1] The Great Lakes Basin contains more than 94,000 square miles of surface water, and is estimated to hold more than six quadrillion gallons of water.[2] The Lakes account for approximately nine-tenths of the United States' fresh water supply and one-fifth of the world's fresh water supply.[3] There are more than 9,000 miles of shoreline, which is greater than the East Coast and Gulf Coast combined.[4] More than thirty million Americans and Canadians depend on the Great Lakes as their source of drinking water.[5] Additionally, the Lakes create more than 1.5 million jobs and generate $60 billion in annual wages.[6] The Great

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[1] *The Great Lakes Basin*, Great Lakes St. Lawrence River Water Res. Reg'l Body, https://www.glslregionalbody.org/about/about-the-great-lakes-st-lawrence-basin/ (last visited Nov. 12, 2023).

[2] *About the Lakes*, Great Lakes Comm'n, https://www.glc.org/lakes/ (last visited Nov. 12, 2023).

[3] *Id.*

[4] Terry Gibb, *H.O.M.E.S. Defines the Great Lakes Region*, Mich. State U. Extension (July 9, 2013), https://www.canr.msu.edu/news/h.o.m.e.s._defines_the_great_lakes_region.

[5] *Great Lakes*, Off. for Coastal Mgmt., https://coast.noaa.gov/states/fast-facts/great-lakes.html (last visited Nov. 16, 2023).

[6] *About the Lakes*, *supra* note 2.

Lakes region serves many industries, including tourism, manufacturing, shipping, agriculture, and mining.[7] There are more than 3,500 animal and plant species that inhabit the region, with some species being found nowhere else in the world.[8] The Great Lakes, their connecting waterways, and the region as a whole are truly one-of-a-kind. Thus, it is critical that they are treated as such, with adequate legal precautions being taken to avoid irreversible harm to them.

Fortunately, the current laws that govern the Great Lakes have been largely successful in protecting them.[9] Specifically, the Great Lakes – St. Lawrence River Basin Water Resources Compact, which was enacted in 2008, is recognized and acknowledged for its success in prohibiting water diversions from the Great Lakes Basin.[10] The Great Lakes Compact is a binational agreement between all eight of the Great Lakes States—Michigan, Wisconsin, Minnesota, Indiana, Illinois, Ohio, Pennsylvania, and New York—and two Canadian provinces—Québec and Ontario[11]—that prohibits water diversions from the Great Lakes Basin with just a few limited exceptions.[12] Despite the Compact's overall success, it contains several "loopholes" and ambiguities. One such loophole is referred to as the "bottled water loophole," which allows for the removal of water from the Great Lakes if the water is held in containers of 5.7 gallons or less.[13] In theory, this would allow bottled water companies like BlueTriton (formerly Nestlé) to remove water from the Lakes and capitalize on a resource that is intended to be enjoyed by the public.[14] In addition to the bottled water loophole, the Compact contains multiple ambiguous and poorly defined provisions, which could be taken advantage of by corporations if they are left unaddressed.

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[7] Gibb, *supra* note 4.

[8] *About the Lakes*, *supra* note 2.

[9] *See The Great Lakes Compact*, All. for the Great Lakes, https://greatlakes.org/campaigns/defending-the-great-lakes-compact/ (last visited Nov. 12, 2023).

[10] David Strifling, *The Great Lakes Compact at 10: Significant Achievements, But Still a Work in Progress*, Marq. U. L. Sch. (Oct. 25, 2018), https://law.marquette.edu/facultyblog/2018/10/the-great-lakes-compact-at-10-significant-achievements-but-still-a-work-in-progress/.

[11] *Great Lakes Compact*, Ind. Dep't of Nat. Res., https://www.in.gov/dnr/water/lake-michigan/great-lakes-compact/ (last visited Nov. 12, 2023).

[12] *See Great Lakes Compact Celebrates 15th Anniversary*, All. for the Great Lakes (Dec. 8, 2023), https://greatlakes.org/2023/12/great-lakes-compact-celebrates-15th-anniversary/.

[13] Allison R. Donahue, *Bills Would Protect Michigan's Freshwater Supply, Close Bottled Water Loophole*, Mich. Advance (Mar. 17, 2022, 11:33 AM), https://michiganadvance.com/2022/03/17/bills-would-protect-michigans-freshwater-supply-close-bottled-water-loophole/.

[14] *Id.*

Part I of this Note examines the history of legislation governing the protection of the Great Lakes. Part II discusses the several applications for water diversions that have been made under the Compact. Part III analyzes the global water crisis and how it affects the Great Lakes region. Part IV of this Note examines the controversy regarding some of the Compact's provisions. Lastly, Part V proposes reasonable solutions to each of the Compact's weaknesses discussed throughout this Note.

I. History of the Laws Governing the Great Lakes

With two countries, eight states, two provinces, dozens of Native American tribes, and many local governments having cultural and economic interest in the Great Lakes, the laws protecting the Lakes are complex and often overlapping.[15] This Part explores the legal doctrines and laws that have governed the Great Lakes throughout the years, beginning with the public trust doctrine and examining every major statute in the Great Lakes' history.

A. The Public Trust Doctrine in the Great Lakes Region

The public trust doctrine is a central feature of environmental law in the Great Lakes region. It originates in Roman law[16] and maintains that "public trust lands, waters and living resources in a State are held by the State in trust for the benefit of all…people, and establishes the right of the public to fully enjoy public trust lands, waters and living resources for a wide variety of recognized public uses."[17] In general, "all navigable waters and the lands beneath [such] waters are subject to the Public Trust Doctrine."[18] All eight of the Great Lakes States recognize some variation of the public trust doctrine in their legislative frameworks.[19]

In Michigan, for example, the public trust doctrine is recognized in its Constitution, stating that "[t]he conservation and development of the natural resources of the state are…of paramount public concern in the interest of the health, safety and general welfare of the people"[20] and

[15] Hannah MacDonald, *The Messy Overlapping Systems Governing the Great Lakes*, Inst. for Pub. Pol'y & Soc. Rsch., Mich. State Univ. (Dec. 15, 2017, 4:40 PM), http://www.ippsr.msu.edu/public-policy/michigan-wonk-blog/messy-overlapping-systems-governing-great-lakes.

[16] Shay Elbaum, *Michigan's Groundwater and the Public Trust Doctrine*, Mich. Bar J. (June 2022), https://www.michbar.org/journal/Details/Michigans-groundwater-and-the-public-trust-doctrine?ArticleID=4451.

[17] David C. Slade et al., *Putting the Public Trust Doctrine to Work*, Nat'l Oceanic & Atmospheric Admin. 3 (June 1997), https://shoreline.noaa.gov/docs/8d5885.pdf.

[18] *Id.*

[19] Elbaum, *supra* note 16.

[20] Mich. Const. art. IV, § 42.

requires that the legislature "provide for the protection of the…water and other natural resources of the state from pollution, impairment and destruction."[21] Wisconsin also recognizes the public trust doctrine in its Constitution, providing that "the river Mississippi and the navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways and forever free, as well to the inhabitants of the state as to the citizens of the United States, without any tax, impost or duty therefor."[22] Minnesota's constitutional provision recognizing the public trust doctrine closely resembles that of Wisconsin's, and provides that Minnesota has "jurisdiction on the Mississippi and on all other rivers and waters forming a common boundary with any other state or states. Navigable waters leading into the same, shall be common highways and forever free to citizens of the United States without any tax, duty, impost or tell therefor."[23] Illinois's public trust doctrine provision within its Constitution is broader, holding that "[t]he public policy of the State and the duty of each person is to provide and maintain a healthful environment for the benefit of this and future generations."[24]

Alternatively, Ohio recognizes the public trust doctrine by statute, which states that the "waters of Lake Erie…do now belong and have always…belonged to the state as proprietor in trust for the people of the state, for the public uses to which they may be adapted, subject to the powers of the United States government."[25] Indiana also adheres to the public trust doctrine through statute, which declares that the "natural resources and the natural scenic beauty of Indiana are a public right,"[26] and includes "the use of the public freshwater lakes for recreational purposes."[27] Additionally, Indiana "holds and controls all public freshwater lakes in trust for the use of all of the citizens of Indiana."[28] In New York, it is "public policy…that [t]he waters of the state be conserved and developed for all public beneficial uses."[29] Lastly, Pennsylvania recognizes the public trust doctrine in its Constitution, which declares that "[t]he people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come."[30]

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[21] *Id.*
[22] Wis. Const. art. IX, § 1.
[23] Minn. Const. art. II, § 2.
[24] Ill. Const. art. XI, § 1.
[25] Ohio Rev. Code Ann. § 1506.10 (West 2023).
[26] Ind. Code Ann. § 14-26-2-5(c)(1) (West 2023).
[27] *Id.* § 14-26-2-5(c)(1)(2)(B) (Westlaw).
[28] *Id.* § 14-26-2-5(d)(2) (Westlaw).
[29] N.Y. Env't Conserv. Law § 15-0105(2) (West 2024).
[30] Pa. Const. art. I, § 27.

B. The Boundary Waters Treaty of 1909

Formal discussion regarding how to best protect the Great Lakes began in the early twentieth century with the enactment of the Boundary Waters Treaty, which was signed by the United States and Canada.[31] The Treaty intended to resolve disputes over use of the waters shared by the two countries by prohibiting water diversions and other actions affecting the waters without approval of the opposite country.[32] The Treaty's most important achievement is its establishment of the International Joint Commission (IJC), which was created to help the United States and Canada in implementing the Treaty's provisions.[33] The IJC is an independent binational organization[34] and has two primary responsibilities: reviewing proposals that affect water flows and levels across the boundary, and recommending solutions to transboundary issues.[35] The recommendations and determinations made by the IJC consider a range of water uses, including drinking water, hydroelectric power generation, commercial shipping, agriculture, and fishing.[36]

The IJC has six Commissioners—three from the United States and three from Canada.[37] The Commissioners are appointed by the highest level of government in each country—in Canada, the Cabinet, and in the United States, the President (with confirmation from the Senate).[38] Rather than answering to their respective countries, the Commissioners work together to create solutions that are in the best interests of both countries.[39]

The process that led to the enactment of the Boundary Waters Treaty began in 1903, when the United States and Canada created the International Waterways Commission to address potentially conflicting rights in the waterways shared by the countries.[40] The International

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[31] *The Great Lakes*, Nat'l Oceanic & Atmospheric Admin., https://www.noaa.gov/general-counsel/gc-international-section/great-lakes (Mar. 20, 2023).

[32] Courtney M. Hammer, Note, *Standing Under the Great Lakes Compact: A Broad-Based Argument Infused with Public Trust Principles for Those with Diversion Aversion*, 2018 Mich. St. L. Rev. 251, 265.

[33] *The Boundary Waters Treaty of 1909*, Int'l Joint Comm'n, https://www.ijc.org/en/boundary-waters-treaty-1909 (last visited Nov. 12, 2023).

[34] Terry Gibb, *International Joint Commission: Great Lakes Watchdog*, Mich. State U. Extension (Jan. 3, 2019), https://www.canr.msu.edu/news/international-joint-commission-great-lakes-watchdog.

[35] *Role of the IJC*, Int'l Joint Comm'n, https://ijc.org/en/who/role (last visited Nov. 12, 2023).

[36] Gibb, *supra* note 34.

[37] *Id.*

[38] *Commissioners*, Int'l Joint Comm'n, https://ijc.org/en/who/people/commissioners (last visited Mar. 8, 2024).

[39] *Id.*

[40] Noah D. Hall & Benjamin C. Houston, *Law and Governance of the Great Lakes*, 63 DePaul L. Rev. 723, 729 (2014).

Waterways Commission proposed a treaty that would govern the countries' uses of the shared boundary waters and create an international body to increase protection of boundary waters.[41] The proposed treaty was modified through negotiations and eventually led to the Boundary Waters Treaty of 1909.[42]

C. The Great Lakes Water Quality Agreement of 1972

The pollution provisions of the Boundary Waters Treaty and the IJC's responsibility as the international overseer of the Great Lakes' health ultimately led to the enactment of the Great Lakes Water Quality Agreement in 1972.[43] The Great Lakes Water Quality Agreement is also a binational agreement between the United States and Canada and seeks to protect the water quality of the Great Lakes by limiting pollution from industries and communities in the Great Lakes region.[44] The Agreement set more precise water quality objectives, including new requirements for industrial waste, regulations for discharges from ships, and regulations for municipal sewage discharges.[45] However, the primary focus of the 1972 Agreement was phosphorus pollution.[46] Specifically, the Agreement created new procedures for addressing eutrophication[47] in the lower Lakes caused by phosphorus discharges.[48]

The 1972 Agreement also gave the IJC additional duties.[49] On top of its initial responsibilities designated by the Boundary Waters Treaty, the IJC was assigned the responsibility of analyzing and disseminating information related to water quality, advising the United States and

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[41] *Id.*

[42] *Id.*

[43] *Id.* at 732.

[44] *History of the Great Lakes Water Quality Agreement*, Int'l Joint Comm'n, https://www.ijc.org/en/what/glwqa-history (last visited Feb. 25, 2024).

[45] Hall & Houston, *supra* note 40, at 733.

[46] *Id.*

[47] Eutrophication refers to "the gradual increase in the concentration of phosphorus, nitrogen, and other plant nutrients in an aging aquatic ecosystem.…The productivity or fertility of such an ecosystem naturally increases as the amount of organic material that can be broken down into nutrients increases. This material enters the ecosystem primarily by runoff from land that carries debris and products of the reproduction and death of terrestrial organisms. Water blooms, or great concentrations of algae and microscopic organisms, often develop on the surface, preventing the light penetration and oxygen absorption necessary for underwater life. Eutrophic waters are often murky and may support fewer large animals, such as fish and birds, than non-eutrophic waters." The Editors of Encyclopaedia Britannica, *Eutrophication*, Britannica, https://www.britannica.com/science/eutrophication (Nov. 14, 2024).

[48] Hall & Houston, *supra* note 40, at 733.

[49] *Id.*

Canada, including their state and provincial governments, and annually reporting on the progress of the Agreement's water quality objectives.[50] However, the United States' Environmental Protection Agency and Canada's Environment and Climate Change Canada—not the IJC—are primarily responsible for administering the programs and accomplishing the objectives of the Great Lakes Water Quality Agreement.[51]

In 1978, the United States and Canada expanded the Great Lakes Water Quality Agreement and set a comprehensive goal to eliminate the presence of persistent toxic substances, which damage species' health because they remain in the ecosystem for long periods of time.[52] The 1978 Agreement accomplished this goal by following an approach that took into consideration the ecosystem as a whole.[53] Specifically, the 1978 Agreement's purpose was "to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem."[54] The Parties' policy was that "the discharge of toxic substances in toxic amounts be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated."[55]

The Great Lakes Water Quality Agreement was amended again in 1987 to expand the scope of the 1978 Agreement to include responses to emerging issues and to address nonpoint source pollution.[56] Nonpoint source pollution is typically the result of land runoff, drainage, and seepage that picks up man-made pollutants and deposits them into coastal waters, wetlands, rivers, lakes, and ground waters.[57] Thus, the 1987 amendment reinforced existing provisions and created additional provisions to the Agreement.[58]

In 2012, the United States and Canada revised and expanded the Agreement again after previous assessment reports and recommendations by the IJC.[59] This amendment included nine new objectives that the United States and Canada committed to achieving and ten annexes that outlined the countries' devotion to specific issues affecting the water quality of the Great Lakes.[60]

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[50] *Id.*

[51] *Id.*

[52] *History of the Great Lakes Water Quality Agreement*, *supra* note 44.

[53] *Id.*

[54] Hall & Houston, *supra* note 40, at 733.

[55] *Id.*

[56] *Id.* at 734.

[57] *Polluted Runoff: Nonpoint Source Pollution*, EPA, https://19january2017snapshot.epa.gov/nps/what-nonpoint-source.html (last visited Feb. 25, 2024).

[58] Hall & Houston, *supra* note 40, at 734.

[59] *The IJC and the Great Lakes Water Quality Agreement*, Int'l Joint Comm'n, https://www.ijc.org/en/what/glwqa-ijc (last visited Feb. 25, 2024).

[60] *Id.*

D. The Great Lakes Charter of 1985

The Great Lakes Charter is a good faith, nonbinding agreement between the eight Great Lakes States and two Canadian provinces to preserve the Great Lakes, their tributary, and their connecting waters.[61] It establishes a consultation process for large water diversions and a resource management program with a Water Resource Management Committee.[62] Under the Charter, a party must give prior notice to the other parties and consult with them before increasing diversions from the Lakes or approving new diversions.[63] The Charter also requires parties to manage all new or increased diversions of water over two million gallons per day over a thirty-day average.[64] Additionally, the Great Lakes Charter requires the parties to collect and share information pertaining to all Great Lakes water extractions of 100,000 gallons per day over a thirty-day average.[65]

Along with the Great Lakes Charter, the Water Resources Development Act was passed by the United States Congress in 1986.[66] The Act governs U.S. Army Corp of Engineers projects, and prohibits any federal agency from conducting any studies that would involve the transfer of Great Lakes water for any reason for use outside of the Great Lakes Basin.[67] The Act does not include any procedure or standard to be followed by the United States or Canada when reviewing proposals to divert water from the Great Lakes.[68]

E. The 2008 Great Lakes – St. Lawrence River Basin Water Resources Compact

In 1998, the Nova Group, which is a Canadian consulting company, announced its plan to ship 158 million gallons of water from Lake Superior to Asia via tanker ships.[69] The plan was approved by the Ontario Ministry of the Environment, causing public outrage in both Canada and the United States.[70] Although the plan was extremely

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[61] Peter Schulte, *The Great Lakes Water Agreements*, *in* 7 The World's Water 165, 167 (Peter H. Gleick & Heather Cooley eds., 2d ed. 2012).

[62] *Id.*

[63] *A Brief History of the Great Lakes Charter*, Word Press (Dec. 2, 2006), https://waterwars.wordpress.com/2006/12/02/a-brief-history-of-the-great-lakes-charter/.

[64] *Id.*

[65] *Id.*

[66] *Id.*

[67] *Id.*

[68] *Id.*

[69] *The Great Lakes Compact*, *supra* note 9.

[70] Keith Matheny, *Shipping Great Lakes Water? That's California Dreaming*,

impractical and unlikely to succeed, it caused enough controversy to prompt lawmakers to create more stringent laws regarding diversions from the Great Lakes.[71]

The Great Lakes – St. Lawrence River Basin Water Resources Compact was approved by all eight of the Great Lakes States and the United State Congress, and it became federal law in 2008.[72] The Compact is a legally binding treaty between the United States and Canada that prohibits the diversion of water to areas outside of the Great Lakes Basin.[73] The term "diversion" refers to "a transfer of water from the Great Lakes Basin into another watershed, or from the watershed of [one] of the Great Lakes into that of another."[74] However, water used within the Great Lakes Basin to "manufacture or produce a product that is then transferred out of the Great Lakes Basin"[75] is not considered a diversion. Additionally, under the provisions of the Great Lakes Compact, "[d]iversion includes a transfer of water withdrawn from the waters of the Great Lakes Basin that is removed…in a container greater than 5.7 gallons."[76]

Generally, water diversions from the Lakes to areas outside the Basin are prohibited, but there are three exceptions: 1) communities that straddle the basin divide; 2) intra-basin transfers; and 3) communities in counties that straddle the basin divide.[77] The "straddling communities" exception allows an area "within a Straddling Community but outside the Basin or outside the source of Great Lake Watershed"[78] to divert water from the Great Lakes Basin "regardless of the volume of Water transferred"[79] if "the need for…the proposed Exception cannot be reasonably avoided through the efficient use and conservation of existing water supplies."[80] The "intra-basin transfer" exception allows for diversions if the applicant "demonstrate[s] that there is no feasible, cost effective, and environmentally sound water supply alternative within the Great Lake watershed to which the Water will be transferred."[81]

Det. Free Press (Apr. 19, 2015, 2:28 PM), https://www.freep.com/story/news/local/2015/04/19/michigan-great-lakes-water/25965121/.

[71] *Id.*

[72] *The Great Lakes Compact*, *supra* note 9.

[73] Strifling, *supra* note 10.

[74] Mich. Comp. Laws Serv. § 324.32701(1)(p) (LexisNexis 2008).

[75] *Id.*

[76] *Id.*

[77] *Great Lakes Water Diversions*, Great Lakes Council, https://www.glslcompactcouncil.org/program-areas/water-diversions/ (last visited Nov. 12, 2023).

[78] Great Lakes – St. Lawrence River Basin Water Resources Compact, Pub. L. No. 110-342, § 4.9(1), 122 Stat. 3739, 3752 (2008) [hereinafter Great Lakes Compact].

[79] *Id.*

[80] *Id.* § 4.9(4)(a), 122 Stat. at 3754.

[81] *Id.* § 4.9(2)(b)(ii), 122 Stat. at 3753.

The "communities within straddling counties" exception allows for the diversion of water to a "Community within a Straddling County"[82] if "[t]here is no reasonable water supply alternative within the basin in which the community is located."[83]

II. Water Diversions from the Great Lakes Under the Great Lakes Compact

This Part examines the applications for water diversions that have been made under the Great Lakes Compact. It demonstrates how applications for diversions can be a long and contentious process. This Part also illustrates the need for consistency and urgency when communities within the Great Lakes region are without clean water.

A. The Only Successful Diversion Application for a Community Outside the Basin

In 2013, the City of Waukesha, Wisconsin was the first community to submit an application to the Wisconsin Department of Natural Resources (DNR) to divert water from Lake Michigan for its water supply under the "community within a straddling county" exception.[84] Waukesha is located a couple miles west of Milwaukee and lies completely outside of the Great Lakes Basin.[85] However, because Waukesha is located in a county that is partially inside the Basin, it was able to submit a diversion application under the Compact's "community within a straddling county" exception.[86] Waukesha's reasoning for its diversion application was that its previous water supply was contaminated by high levels of naturally-occurring radium, [87] which required costly treatment.[88]

In 2016, the DNR forwarded its review of Waukesha's application to the Great Lakes Regional Body and Compact Council,[89] which includes representatives from all eight Great Lakes States, Ontario, and

[82] *Id.* § 4.9(3), 122 Stat. at 3753.

[83] *Id.* § 4.9(3)(d), 122 Stat. at 3754.

[84] *City of Waukesha Diversion*, Wis. Dep't of Nat. Res., https://dnr.wisconsin.gov/topic/wateruse/waukesha.html (last visited Jan. 12, 2024).

[85] *The Great Lakes Compact*, *supra* note 9.

[86] *Id.*

[87] *See Michigan's Process Regarding the Great Lakes Water Diversion Application by the City of Waukesha, Wisconsin*, Dep't of Env't, Great Lakes, & Energy, https://www.michigan.gov/egle/about/organization/water-resources/water-use/diversion-application-waukesha (last visited Jan. 14, 2024) (stating that radium is a carcinogen known to cause bone cancer and other health issues).

[88] *City of Waukesha Diversion*, *supra* note 84.

[89] *Id.*

Québec.[90] In 2021, the Compact Council approved Waukesha's diversion application with several conditions.[91] These conditions included a maximum diversion volume of 8.2 million gallons per day, a diversion zone of only the area that was previously being served by Waukesha's water source, [92] treatment of all wastewater with it being returned to Lake Michigan via the Root River,[93] monitored wastewater impacts on the Root River, and annual reporting to the eight Great Lakes States and the two Canadian provinces.[94] Waukesha must also follow Safe Drinking Water Act requirements by monitoring water quality in the distribution system.[95] On October 9, 2023 Waukesha began supplying Lake Michigan water to its approximately 71,000 residents.[96]

The approval of Waukesha's diversion application has caused significant controversy in the Great Lakes region. Opponents of the application have made multiple arguments against its approval, with one argument being that Waukesha does not meet the Compact's definition of a "community within a straddling county."[97] According to the Compact, a "community within a straddling county may be excluded from the prohibition of water diversions if "[t]he Water…[is] used solely for the Public Water Supply Purposes of the Community within a Straddling County that is without adequate supplies of potable water."[98] The Compact defines a "community within a straddling county" as "any incorporated city, town or the equivalent thereof, that is located outside the Basin but wholly within a County that lies partly within the Basin."[99]

In its final decision, the Compact Council found that the City of Waukesha is located entirely within Waukesha County, Wisconsin, and thus meets the Compact's definition of a "community in a straddling county."[100] However, the Compact Council also found that the limits of the approved service area include "land outside the City of Waukesha's

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[90] *Members*, Great Lakes St. Lawrence River Water Res. Reg'l Body, https://www.glslregionalbody.org/about/members/ (last visited Jan. 15, 2024).

[91] *City of Waukesha Diversion*, *supra* note 84.

[92] *Id.*

[93] Bret Lemoine, *Waukesha Water Diversion; Group Monitors Return of Water to Lake Michigan*, Fox6 News Milwaukee (Oct. 11, 2023), https://www.fox6now.com/news/waukesha-water-diversion-group-monitors-return-lake-michigan.

[94] *City of Waukesha Diversion*, *supra* note 84.

[95] *Id.*

[96] Garret Ellison, *Lake Michigan Water Now Flowing into Wisconsin Suburb Taps*, MLive (Oct. 11, 2023, 12:01 PM), https://www.mlive.com/public-interest/2023/10/lake-michigan-water-now-flowing-into-wisconsin-suburb-taps.html.

[97] Adriana Forest, *The Approval of Waukesha's Diversion Application under the Great Lakes – St. Lawrence River Basin Water Resources Compact – Bad Precedent for the Great Lakes*, 41 Can.-U.S. L.J. 69, 85 (2017).

[98] Great Lakes Compact § 4.9.3(a).

[99] *Id.* § 1.2.

[100] Forest, *supra* note 97, at 85.

jurisdictional boundaries" and "land lying within the perimeter boundary of the City of Waukesha that is part of unincorporated land in the Town of Waukesha," which the Council referred to as "Town Islands."[101] The Council included the Town Islands "in the approved service area because for all practical purposes they are within the Applicant's community boundaries."[102] However, critics of Waukesha's approved application argue that this equates to a violation of the Great Lakes Compact because of the Compact's clear definition of "Community within a Straddling County."[103] Because the Council included land outside Waukesha in the approved service area, "the approved service area includes land [that is located in] multiple jurisdictions."[104]

Critics also argue that the City of Waukesha does have access to a reasonable water supply alternative and thus does not qualify for a diversion under the Compact's exception.[105] The Great Lakes Compact does not define "reasonable water supply alternative," but Wisconsin did create its own definition in its adoption of the Compact.[106] Wisconsin defines "'reasonable water supply alternative' as 'a water supply alternative that is similar in cost to, and as environmentally sustainable and protective of public health as the proposed new or increased diversion and that does not have greater adverse environmental impacts than the proposed new or increased diversion.'"[107] Critics of the Council's decision to approve Waukesha's diversion plan argue that the Council chose to use Wisconsin's definition when making its final decision even though the definition does not comply with the principles of the Great Lakes Compact and that the definition is not binding on the Compact Council.[108]

A final argument made by critics of the Waukesha's approved application is that the water diversion will negatively impact the Root River.[109] The Compact provides that if a "community within a straddling county" exception is authorized, it must be shown that the diversion will not negatively impact the Basin Ecosystem.[110] In the Compact Council's final decision, it found that there may be some adverse effects on aquatic life in the Root River, but that the treated and returned water to Lake Michigan would still result in an overall benefit to the Root

[101] *Id.*
[102] *Id.*
[103] *Id.*
[104] *Id.*
[105] *Id.* at 86.
[106] *Id.* at 87.
[107] *Id.*
[108] *Id.*
[109] *Id.* at 90.
[110] Great Lakes Compact § 4.9.3(e).

River by stabilizing water flow during periods of low flow.[111] However, the environmental impact statement prepared by the Wisconsin DNR did not suggest that the Root River would remain unaffected by the returned water.[112] The environmental impact statement showed that "effluent from the Waukesha Wastewater Treatment Plant would cause phosphorus loading in the Root River," causing increased plant growth in the Racine Harbor and which may require herbicide treatment.[113]

B. Other Applications for Water Diversions in the Great Lakes Region

In addition to the Waukesha diversion application, there have been several other communities that have applied for diversions under one of the three exceptions to the Great Lakes Compact, however, Waukesha remains the only successful water diversion application for a community located outside of the Great Lakes Basin. This Section analyzes the other diversion applications under the Great Lakes Compact that either were not successful or were made under one of the other two exceptions to the Compact.

1. The Foxconn Diversion Application

In 2017, Taiwan-based electronics manufacturer Foxconn announced that it was considering building a new manufacturing plant near Lake Michigan in Wisconsin, and Wisconsin politicians quickly put a tax incentive contract together to bring Foxconn to the state.[114] The contract included a $3 billion economic incentive, which was mostly in the form of tax breaks.[115] The package also included environmental policy incentives in the form of exemptions from several state environmental requirements.[116] Foxconn was given permission to build its plant without submitting an environmental impact statement to the State of Wisconsin and was able to alter nearby wetlands and streams without having to obtain environmental permits.[117]

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[111] Forest, *supra* note 97, at 90.

[112] *Id.*

[113] *Id.* at 91.

[114] Ricardo Torres, *What's Happening at the Foxconn Site in Wisconsin Five Years After the Company Announced its Plans*, Milwaukee J. Sentinel (Mar. 23, 2023, 9:08 AM), https://www.jsonline.com/story/money/business/2023/03/23/what-we-know-about-foxconn-in-wisconsin-and-how-we-got-there/70037738007/.

[115] John V. Casey, Note, *Irrigating Industry: Is the Great Lakes Compact Being Drowned for Industrial Gain?*, 2020 U. Ill. L. Rev. 307, 310.

[116] *Id.* at 311.

[117] *Id.*

In April 2018, the Wisconsin DNR approved a water diversion application by Racine County for Foxconn to divert water to the location where it planned to build a $10 billion plant[118] in Mount Pleasant, Wisconsin.[119] Racine County's application requested to withdraw seven million gallons of water per day from Lake Michigan to serve Foxconn's plant.[120] Racine County's application estimated that the plant's operations and evaporation would consume approximately 2.7 million gallons of water daily, with the remaining water would be treated and returned to Lake Michigan.[121]

Approval of the application was highly criticized by conservation groups.[122] These groups cited Foxconn's poor environmental record in Japan and China, and argued that water withdrawals from Lake Michigan would be a violation of the Great Lakes Compact because the Compact requires that withdrawals be made for *public* uses.[123] The Executive Director of the Wisconsin League of Conservation Voters even referred to the diversion as "an unprecedented betrayal of the Great Lakes Compact."[124] Another primary concern of conservationists was that the land Foxconn was building on was located partially outside of the Great Lakes Basin, which risked losing water from the Great Lakes Basin.[125] Fortunately, Foxconn drastically changed its original plans and never began diverting water from Lake Michigan, nor did it fully complete its manufacturing plant.[126] However, the story of Foxconn revealed a significant weakness in the Great Lakes Compact and illustrates how easy it is for private corporations to take advantage of the Great Lakes' resources.

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[118] Ryan Silvola, *Pulling Water from Lake Michigan for Foxconn Plant Approved*, Stateline Bus. J. (Jan. 20, 2020), https://www.beloitdailynews.com/statelinebusiness/news/business-ap/pulling-water-from-lake-michigan-for-foxconn-plant-approved/article_f2c4c1c1-9e36-53b5-ba11-1e932193c1f0.html.

[119] Natasha Blakely, *Great Lakes Water Withdrawals: What's Happening in Wisconsin with Foxconn?*, Great Lakes Now (Sept. 5, 2019), https://www.greatlakesnow.org/2019/09/wisconsin-foxconn-lake-michigan-water-diversion/.

[120] Silvola, *supra* note 118.

[121] *Id.*

[122] *See id.*

[123] *Id.*

[124] *Id.*

[125] *Id.*

[126] Steven Martinez, *Here's a Short Timeline of Foxconn's Plans and Development in Wisconsin*, Milwaukee J. Sentinel (Nov. 10, 2023, 5:55 PM), https://www.jsonline.com/story/money/business/2023/11/10/what-happened-to-foxconn-in-wisconsin-a-timeline/71535498007/.

2. The New Berlin Diversion Application

The first diversion application under the Great Lakes Compact came from New Berlin, which is a suburb of Milwaukee, and was actually submitted while the Great Lakes Compact was still in the process of being created.[127] New Berlin was uniquely positioned to prompt questions and concern about its diversion application.[128] The eastern third of New Berlin was situated within the Great Lakes Basin and had already been receiving water from Lake Michigan.[129] The middle third of New Berlin was located slightly outside the Basin and was receiving its water from contaminated wells.[130] The western third of the town was clearly located outside of the Basin as well, and was receiving its water from wells.[131] Due to its unique position as a straddling community under the Compact, if the Compact was enacted, New Berlin only needed to receive approval from the governor of Wisconsin to begin diverting water from Lake Michigan, instead of approval by all eight of the governors of the Great Lakes States.[132] However, because the Compact had not been approved at the time New Berlin considered applying for a water diversion, Section 1109 of the Water Resources Development Act governed the proposal instead.[133]

New Berlin came across several problems regarding its diversion proposal. First, the city experienced issues when it disregarded the advice of the Wisconsin Department of Natural Resources (DNR) and entered its diversion application for 2.48 million gallons of water per day before the Compact was finalized.[134] The DNR's concern was that the other Great Lakes States might have opposed the application because of this, which the DNR was rightly concerned for, because when Michigan's governor at the time, Jenifer Granholm, became aware of the diversion proposal, she expressed, through the State, that Michigan would not consider a diversion until the Great Lakes Compact was in effect.[135]

New Berlin experienced a second issue when a Wisconsin official's interview with a local journal revealed that Wisconsin had been diverting water outside the Great Lakes Basin for several years without having received approval from the other Great Lakes States, which was a possible violation of the Water Resources Development

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[127] Casey, *supra* note 115, at 326.
[128] *Id.*
[129] *Id.*
[130] *Id.*
[131] *Id.*
[132] *Id.* at 326-27.
[133] *Id.* at 327.
[134] *Id.*
[135] *Id.*

Act.[136] However, Wisconsin defended its water diversions by arguing that return flows were not considered water diversions.[137]

The lengthy debate over whether return flows were considered diversions kept New Berlin's application alive until the Great Lakes States and the federal government officially adopted the Compact in 2008.[138] Once the Compact was in effect, the Straddling Community exception became the governing law, not the Water Resources Development Act, which meant that Wisconsin was no longer required to come to a solution with Michigan regarding New Berlin's diversion application.[139] New Berlin only had to receive approval for its application from Wisconsin's governor. After this, the remaining application process took just a few months and New Berlin's application was approved in May of 2009.[140]

III. Impact of the Global Water Crisis on the Great Lakes Region

There is a growing water crisis across the United States and around the world.[141] According to the United Nations' World Water Development Report, the primary cause of the water crisis is water mismanagement, which has a significant effect on natural environments and those living in poverty.[142] Despite the fact that most of the planet is covered in water,[143] the vast majority of it is unusable by humans.[144] Ninety-seven percent of the planet's water is found in the oceans—making it unusable for most human needs—while just 3% is freshwater.[145] However, even most of the planet's freshwater is unavailable because it is held in polar ice

[136] *Id.*

[137] *Id.*

[138] *Id.* at 328.

[139] *Id.*

[140] *Id.*

[141] *See* Morgan B. Bianco, *The Battle Against Bottled Water: How the Michigan Supreme Court Failed to Protect the Great Lakes and Impaired the Effectiveness of the Great Lakes Compact in* Michigan Citizens for Water Conservation v. Nestlé Waters North America, Inc., 31 Hamline L. Rev. 836, 855 (2008).

[142] *Id.*

[143] *See* Water Science School, *The Distribution of Water On, In, and Above the Earth*, U.S. Geological Surv. (Oct. 25, 2019), https://www.usgs.gov/media/images/distribution-water-and-above-earth ("About 71% of the Earth's surface is water-covered….").

[144] *See Earth's Fresh Water*, Nat'l Geographic, https://education.nationalgeographic.org/resource/earths-fresh-water/ (last visited Jan. 13, 2024) ("[O]f all the water on Earth, more than 99% of Earth's water is unusable by humans….").

[145] *Water Facts – Worldwide Water Supply*, Bureau of Reclamation (Nov. 4, 2020), https://www.usbr.gov/mp/arwec/water-facts-ww-water-sup.html.

caps and glaciers, lies too far below Earth's surface to be extracted, or is highly polluted.[146] This leaves just 0.5% of Earth's total water supply as accessible freshwater.[147] Of the planet's freshwater that is available, there is a significant discrepancy between regions and countries where the water is located.[148] Pollution is a major issue regarding freshwater access because it reduces the availability of "water resources when local freshwater is contaminated by waste."[149] Climate change also impacts the quality of and access to freshwater.[150] It is believed that in the next few decades, the world will need at least 55% more freshwater than what is currently available in order to meet the needs of its growing population.[151]

Despite its enormous supply of freshwater, the Great Lakes Basin region is not immune from the global water crisis. Most of the Great Lakes' water levels have been declining recently.[152] In December 2023, Lake Superior's water level was down eight inches from December 2022 and was two inches below its average December water level.[153] This indicates that the amount of water exiting Lake Superior and flowing into Lakes Huron and Michigan is now below average.[154] The water levels of Lakes Huron and Michigan were one inch lower in December 2023 than in December 2022.[155] However, Lake Erie's water level was up four inches and Lake Ontario's water level was up one inch in December 2023 compared to December 2022.[156] Although it is normal for the Lakes' water levels to fluctuate, both high and low water levels create challenges in the Great Lakes region, including adverse impacts on hydropower generation and commercial shipping if the levels are too low, and shoreline erosion and flooding if the levels are too high.[157]

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[146] *Id.*

[147] *Id.*

[148] Bianco, *supra* note 141, at 855.

[149] *Id.*

[150] *Id.*

[151] Jared Teutsch, *On Track? Ensuring the Reliance of the Great Lakes Compact*, All. for the Great Lakes 1 (Sept. 26, 2013), https://www.issuelab.org/resources/15887/15887.pdf.

[152] Bill Steffen, *Great Lakes Water Levels*, Wood TV8 (Dec. 25, 2023, 7:08 AM), https://www.woodtv.com/weather/great-lakes-water-levels-13/.

[153] *Id.*

[154] *Id.*

[155] *Id.*

[156] *Id.*

[157] *Lake Levels*, GLISA, https://glisa.umich.edu/resources-tools/climate-impacts/lake-levels/ (last visited Mar. 8, 2024).

IV. Public Concern Regarding the "Bottled Water Loophole" and Other Water Extractions

In addition to the explicitly stated exceptions to the Great Lakes Compact, there is a "loophole" that allows for the extraction of surface water from the Lakes if the water is held in containers of 5.7 gallons or less—commonly referred to as the "bottled water loophole."[158] Individual parties maintain personal discretion to address removals of 5.7 gallons or less that occur in their jurisdictions.[159] Although this loophole is unlikely to lead to significant damage to the Great Lakes, there are numerous public interest groups that advocate for the loophole to be amended or closed.[160]

These public interest groups have been advocating for the closure of the bottled water loophole since the enactment of the Great Lakes Compact in 2008.[161] Among these groups is Michigan Citizens for Water Conservation (MCWC), which was established in 2000 after Nestlé Waters North America was granted a permit to withdraw hundreds of gallons of groundwater per minute in Mecosta County, Michigan.[162] MCWC sued Nestlé in *Michigan Citizens for Water Conservation v. Nestlé Waters North America* over issuance of this permit.[163] The Michigan Court of Appeals held that the rate at which Nestlé was extracting groundwater was unreasonable.[164] Another public interest group that advocates for the protection of the Great Lakes is FLOW.[165] Like MCWC, FLOW seeks to protect the Great Lakes by raising awareness of bottled water companies' extractions of groundwater in Michigan.[166] Additionally, the group Clean Water Action argues that the bottled water loophole allowing for diversions of 5.7 gallons or less is a direct contradiction

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[158] *Our Water Must Never be for Sale – Explaining Public Trust and Why it Matters*, Clean Water Action, https://cleanwater.org/our-water-must-never-be-sale-explaining-public-trust-and-why-it-matters (last visited Nov. 19, 2023).

[159] *See* Great Lakes Compact § 4.12(10).

[160] *See, e.g.*, *Our Water Must Never be for Sale*, *supra* note 158.

[161] *See, e.g.*, *Keep Michigan's Water Public*, Clean Water Action, https://cleanwater.org/MIpublictrust (last visited Nov. 20, 2023).

[162] *About Us*, Mich. Citizens for Water Conservation, https://savemiwater.org/about-page-info-about-mcwc (last visited Nov. 20, 2023).

[163] Rachel Westmaas, Note, *Old Law, New Solution: Bottling Water in the Great Lakes States*, 2021 Mich. St. L. Rev. 655, 659 (2021); *see* Mich. Citizens for Water Conservation v. Nestlé Waters of N. Am., Inc., 709 N.W.2d 174 (Mich. Ct. App. 2005), *aff'd*, 737 N.W.2d 447 (Mich. 2007).

[164] *Mich. Citizens for Water Conservation*, 709 N.W.2d at 224.

[165] *See generally About Us*, FLOW, https://forloveofwater.org/about-us/ (last visited Nov. 20, 2023).

[166] *See, e.g.*, *Get Off the Bottle*, FLOW, https://forloveofwater.org/get-off-the-bottle/ (last visited Nov. 13, 2024).

to the public trust doctrine.[167] The group has stated that the loophole's existence "sets a dangerous precedent—it opens the door to our water being for sale."[168]

A. The Bottled Water Loophole Goes Against the Very Purpose of the Great Lakes Compact

With the threat of the water crisis and other environmental issues, scholars have concluded that the Great Lakes Compact is necessary to ensure the protection of the Great Lakes Basin.[169] Because water diversions from the Great Lakes to areas outside the Basin are largely prohibited, the Compact provides essential protection to the Lakes.[170] However, the Great Lakes region is already experiencing demands for its water supply from areas outside the Great Lakes Basin.[171] Although the Great Lakes Compact has been largely successful in protecting the Great Lakes,[172] the bottled water loophole contradicts the Compact's very purpose.

B. A Currently-Existing Alternative to Amending the Great Lakes Compact is the Option of Citizen Suits in Response to Harmful Diversions

An existing alternative to closing the bottled water loophole by amending the Great Lakes Compact is achievable through citizen suits against corporations whose diversion activities harm the groundwater, and by extension, the Great Lakes. "This option allows citizens who are directly affected by the activities of bottled water companies to take action to protect themselves and their land."[173] For example, in situations like *Michigan Citizens for Water Conservation*, "where a bottled water company extracts groundwater and thereby negatively affects the bodies of water that spring from the same groundwater source, the citizens who are riparian owners to [those] bodies of water have a significant interest in the bottled water company's activities because [the citizens'] ability to use…the water is impaired."[174] Citizen suits against bottled water

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[167] *Our Water Must Never be for Sale*, *supra* note 158.

[168] *Id.*

[169] *See* Bianco, *supra* note 141, at 866.

[170] *Id.*

[171] *See, e.g.*, *City of Waukesha Diversion*, *supra* note 84 ("Waukesha applied to the DNR for a diversion of Lake Michigan water under the Great Lakes Compact and Agreement as a 'community in a straddling county' in a revised application in 2013.").

[172] *See generally* Strifling, *supra* note 10.

[173] Bianco, *supra* note 141, at 869.

[174] *Id.*

companies allow riparian owners to address damage resulting from the companies in the specific area where the damage was caused.[175] If the riparian owners are able to show that they were directly affected by bottled water companies' extraction activities, they can put an end to the companies' harmful actions through the judicial system.[176]

However, those residing in the Great Lakes region should not rely solely on the option of citizen suits to protect themselves. Although citizen suits may be more likely to put a stop to bottled water companies that are causing harm to the Great Lakes Basin and the environment, a lawsuit would not be able to be brought until after some harm has already been done. The Great Lakes are a vital and precious resource, so it is imperative that any harm to them is prevented in the first place, rather than remedied through the judicial system once harm has already occurred.

V. Recommend Changes to the Great Lakes Compact

The Great Lakes Compact has been largely successful in protecting the Great Lakes from unnecessary water diversions. However, as the climate crisis continues and other threats emerge, even sound policy needs to be reexamined and adjusted to best serve the needs of those it intends to protect.[177] The Compact is considered a step in the right direction for protecting the Lakes, but is "just the beginning of a long journey."[178] The Great Lakes Compact as it currently exists contains several weaknesses that allow for the potential depletion of the Great Lakes if these weaknesses are left unaddressed. This Part further analyzes these weaknesses and proposes reasonable solutions to each of them.

A. Closing the Bottled Water Loophole

The Great Lakes Compact must close the bottled water loophole that allows for the extraction of water held in containers that are 5.7 gallons or less.[179] Closure of the loophole may be accomplished in two different ways.[180] First, each of the eight Great Lakes States may close the loophole individually by amending their state codes and prohibiting

[175] *Id.*

[176] *Id.* at 869-70.

[177] *See* Gary Wilson, *Great Lakes Compact at 15: How States Worked Prevented Water Diversions*, Bridge Mich. (Dec. 26, 2023), https://www.bridgemi.com/michigan-environment-watch/great-lakes-compact-15-how-states-worked-prevented-water-diversions.

[178] *Id.*

[179] Great Lakes Compact § 4.12(10).

[180] Westmaas, *supra* note 163, at 693.

extractions of 5.7 gallons or less in the same manner as any other sized extraction, which is what the state of Michigan has proposed to do.[181] As an alternative, the Great Lakes States can seek permission from the United States and Canadian governments to directly amend the Great Lakes Compact and close the loophole.[182] However, due to the complexity of directly amending the Great Lakes Compact, it would take much longer to succeed in closing the loophole by amendment.[183]

The issue with the bottled water loophole in its current form is that it does not place an upper limit on the total number of gallons that may be extracted from the Lakes. Thus, private companies may collect and sell millions of gallons of water from the Great Lakes as long as the water is held in small enough containers. One possible solution to this issue is to maintain the current exception for containers of 5.7 gallons or less and impose a reasonable upper limit on the total number of gallons extracted. The upper limit should be large enough to allow individuals to make use of the water, but not so large that bottled water companies and other private corporations are incentivized to collect and sell the water.

B. Revising the Straddling Community Exception

The diversion applications of Waukesha, Foxconn, and others are a clear indication that the current straddling community provisions under the Compact need reconsideration. The process by which straddling community exceptions are made should be altered to be a more uniform and consistent process.[184] The Waukesha diversion application illustrates the exceptions' weaknesses and inconsistencies because Waukesha's diversion application took six years to be approved under the community in a straddling county exception.[185] The case of Waukesha differs significantly from the case of New Berlin, where it took just a few months for the city to receive diversion approval under the Compact.[186]

States like Wisconsin, whose communities are suffering from access to clean water, may be more likely to approve diversion applications for straddling communities.[187] Thus, allowing the final decision to be made by just one state, which is what will occur even if a Straddling Community proposal is subject to regional review,

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[181] *See id.*
[182] *Id.*
[183] *Id.*
[184] Casey, *supra* note 115, at 337.
[185] *Id.*
[186] *Id.* at 328.
[187] *Id.* at 337.

is troublesome.[188] A state in this situation would be more than likely confronted with a conflict of interest when making its decision due to the associated political and economic pressures.[189] This conflict goes against the Great Lakes Compact's principle that "[t]he most effective means of protecting, conserving, restoring, improving and managing the Basin Waters is through the joint pursuit of unified and cooperative principles, policies and programs mutually-agreed upon, enacted and adhered to by all Parties."[190]

However, requiring there to be unanimity when voting on applications from straddling communities may be too burdensome.[191] Thus, a simple majority vote would be a more appropriate alternative whereby five out of the eight Great Lakes States must vote in favor of a diversion application before the application may proceed.[192] This method would allow for each of the Great Lakes States to participate and have a say in the diversion application process while remaining less stringent than the diversion application process for a community within a straddling county.[193]

C. Redefining the Term "Public Use"

Additionally, the eight Great Lakes States, Québec, and Ontario should work out a clearer meaning for the Compact's understanding of "public use." A better definition of the term would avoid debates like the one regarding Foxconn's diversion proposal, where large private corporations might try to take advantage of diversion applications under the Compact to benefit themselves rather than the public.[194] Each state could resolve this issue by requiring that all diversion applications intend to be *mostly* for public use.

Alternatively, the Great Lakes States and Canadian provinces could amend the Compact to set out a percentage threshold with an upper limit that determines the amount of water a private corporation may divert from the Lakes.[195] The percentage could be determined by already existing water usages in each state, specifically in the areas where large industrial activity exists.[196] Placing an upper limit like this would provide a significantly better understanding of the term "public use," thus creating a more consistent procedure for states to follow

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[188] *Id.*
[189] *Id.*
[190] Great Lakes Compact § 1.3(2)(f); *see also id.* at 337.
[191] Casey, *supra* note 115, at 337.
[192] *Id.*
[193] *Id.*
[194] *Id.*
[195] *Id.* at 338.
[196] *Id.*

when considering a diversion application.[197] This solution would also eliminate the "guesswork" that is currently associated with the public use requirement.[198]

Conclusion

The global water crisis is not a new phenomenon. Rather, it is a growing issue. It is unlikely to be resolved, and the Great Lakes Basin region is not immune from its consequences.[199] Although the Great Lakes States and Canadian provinces have made significant progress in protecting the Lakes since the enactment of the Boundary Waters Treaty in 1909, there will continue to be new issues that arise.[200] In order to be prepared for an increased demand in Great Lakes water, the Great Lakes States and Canadian provinces must resolve the Compact's weaknesses in ways that make the Compact less susceptible to being misconstrued, especially by private corporations that could profit from its ambiguities.

Each state has a duty as trustee of the waters of the Great Lakes to preserve the Lakes for the benefit of the public.[201] This means that private corporations and industries should not be prioritized over the welfare and interests of the individual citizens of each state, as well as the citizens of the Canadian provinces. As the climate crisis worsens and the world's supply of fresh water becomes increasingly scarce, it is imperative that the Great Lakes Compact takes adequate precautions to prevent the depletion of the Lakes, even if any harm from water diversions seems unlikely to occur now.

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[197] *Id.*

[198] *Id.*

[199] *See* Bianco, *supra* note 141, at 872.

[200] Casey, *supra* note 115, at 339.

[201] *See* Kenneth K. Kilbert, *The Public Trust Doctrine and the Great Lakes Shores*, 58 Cleveland. St. L. Rev 1, 2 (2010).

Don't Shock the Dog: Addressing Animal Welfare and Consumer Protection in the Dog Training Industry

Krista Wirth*

Introduction

Carolina entrusted her seven-year-old German Shepherd, Scott, to a dog trainer for a board and train.[1] Two weeks later, the trainer returned a different dog.[2] The trainer first denied the dog was not Scott, then stated Scott ran away, and then claimed, "maybe he's dead."[3] The local police department began investigating.[4] Megan entrusted her French bulldog, Winston, to a trainer for a board and train.[5] She never saw Winston again.[6] The trainer refused to tell her what happened to Winston and is facing felony cruelty charges.[7] Emeka and Masera left their Bernadoodle, Brooklyn, with a trainer while they went away on their honeymoon.[8] The trainer told them Brooklyn died and has been indicted on felony cruelty charges.[9] These tragic stories are part of a disturbing trend across the country, where dog trainers are facing

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[1] Michael Finney & Randall Yip, *License Requirement for Dog Trainers Stymied by Intense Lobbying from American Kennel Club*, ABC 7 News (Apr. 13, 2023), https://abc7news.com/dog-trainer-training-license-american-kennel-club/13114814/.

[2] *Id.*

[3] *Id.*

[4] *Id.*

[5] Michael Finney & Randall Yip, *NorCal Auburn K9 Dog Trainer Faces Felony Charges for Animal Cruelty*, ABC 7 News (Aug. 26, 2022), https://abc7news.com/dog-training-auburn-k9-trainer-qualifications-assembly-bill-1901/12158669/.

[6] *Id.*

[7] *Id.*

[8] Matt Howerton, *North Texas Dog Trainer Indicted on Animal Cruelty Charges After 3 Family Pets Die in His Care*, WFAA (Sept. 28, 2023), https://www.wfaa.com/article/news/local/tarrant-county/north-texas-dog-trainer-indicted-animal-cruelty-charges-after-3-family-pets-die-in-care/287-2587f7fd-9411-453a-80da-56ca2e7aaad2.

[9] *Id.*

criminal prosecution after beloved family dogs are abused, disappear, or die while in the care of dog trainers.[10]

The dog training industry in the United States is largely unregulated. Over eighty million dogs live in U.S. households and billions of dollars are spent annually on services like dog training.[11] But no U.S. state requires dog trainers to be credentialed or hold professional licenses.[12] This lack of professional accountability for dog trainers has created substantial health, safety, welfare, and consumer protection issues. A person can claim to be a professional dog trainer or behaviorist without any experience, expertise, or specialized training. Consumers seeking the assistance of a dog trainer may not be aware of the industry's lack of regulation or have the knowledge needed to avoid potentially harmful dog training practices. Additionally, a power imbalance can exist between trainers and clients, with clients potentially taking a trainer's advice at face value because the trainer is perceived to be an expert. Some dog trainers and dog training devices may also market themselves in misleading or deceptive ways. For example, some devices and practices may be marketed to consumers as "safe" or "humane," but may, in fact, pose unacceptable health and safety risks or fail to adequately warn consumers of those risks.

There is much debate within the industry as to which tools, devices, and methodologies should be used to train dogs. And much of this debate happens for a good reason: dog training is not always 'sits' and 'stays'—sometimes, dogs' lives are at stake. According to the American Veterinary Society of Animal Behavior (AVSAB), "[b]ehavioral issues, not infectious diseases, are the number one cause of death for dogs under three years of age."[13]

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[10] *See, e.g.*, *Police Investigate Alleged Animal Abuse at NJ Dog Training Center After Disturbing Video Surfaces*, ABC 7 NY (Mar. 14, 2023), https://abc7ny.com/animal-abuse-rahway-dog-trainer-bubba-luv-training/12949997/ (explaining that police are investigating videos that allegedly show dogs being beaten and choked at a dog training facility); *see also* Kirsten Glavin, *Burlington Firefighter Who Ran Boston Dog Training Facility Charged with Animal Cruelty*, NBC 10 Boston (May 12, 2023), https://www.nbcboston.com/news/local/burlington-firefighter-who-ran-boston-dog-training-facility-charged-with-animal-cruelty/3043642/ (noting that a dog trainer was charged with animal cruelty after an investigation found evidence of abuse and neglect); Allen Cone, *Dog Trainer Faces 5 Charges of Animal Cruelty*, WPTV W. Palm Beach (Apr. 22, 2023), https://www.wptv.com/news/region-c-palm-beach-county/loxahatchee-acreage/dog-trainer-faces-five-charges-of-animal-cruelty (explaining that a dog trainer is facing several counts of animal cruelty after allegedly choking and kicking dogs).

[11] *See U.S. Pet Ownership Statistics*, Am. Veterinary Medical Ass'n (2022), https://www.avma.org/resources-tools/reports-statistics/us-pet-ownership-statistics; *U.S. Pet Industry Reaches $147 Billion in Sales in 2023*, Am. Pet Prods. Ass'n (Apr. 2, 2024), https://www.americanpetproducts.org/news/press-release/u.s.-pet-industry-reaches-147-billion-in-sales-in-2023.

[12] *See* Finney & Yip, *supra* note 1.

[13] *AVSAB Position Statement on Puppy Socialization*, Am. Veterinary Soc'y

This Note argues that dog trainers should be held to professional licensing requirements and that electric shock collars, which are also known as E-collars, electrical collars, or shock collars, (hereafter "electric collars" or "electric shock collars") should be banned. Part I of this Note examines the lack of regulation in the dog training industry and the associated health, safety, and welfare issues. Part II provides a case study that highlights the problems associated with a lack of regulation in the industry: the use of electric shock collars. It discusses the health, safety, welfare, and consumer protection issues associated with electric collars and the legal efforts to prohibit their use. Part II examines electric collar bans in other countries and device bans in other nonhuman animal industries like the rodeo industry. Lastly, Part III discusses two recommendations: 1) professional licensing requirements for dog trainers and 2) a ban on electric shock collars.

I. A Lack of Regulation Exists in the Dog Training Industry

The dog training industry in the United States is largely unregulated, with no U.S. state requiring that dog trainers be credentialed or hold a professional license.[14] However, the industry is gaining attention from legislatures.[15] This attention has largely arisen out of high-profile, egregious cases of dog trainers allegedly abusing, disappearing, or killing dogs.[16] While there have been some attempts to regulate the industry, little progress has been made.

Section A of this Part provides a brief overview of the dog training industry, particularly as it relates to the tools, devices, and methodologies used in dog training. Section B discusses arguments

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of Animal Behav. (2008), https://avsab.org/wp-content/uploads/2018/03/Puppy_Socialization_Position_Statement_Download_-_10-3-14.pdf.

[14] *See* Finney & Yip, *supra* note 1. Some states, however, set credentialing or other requirements for guide dog trainers. *See, e.g.*, Cal. Bus. & Prof. Code § 7200 (West 2018) (This source establishes criteria for the use of the words "'guide dog instructor,' 'certified guide dog instructor,' or any other terms or letters indicating or implying that [the person] is an instructor trained in the utilization or training of guide dogs for the blind."); *see also* Tenn. Code Ann. § 62-7-112 (2023) (permitting places of public accommodation to require that a "dog guide trainer present[] for inspection credentials issued by an accredited school for training dog guides"); Ala. Code § 21-7-4 (2019) (permitting places of public accommodation to ask a service or guide dog trainer for "photo identification stating that the trainer is an employee, volunteer, agent, or graduate of a school for seeing eye, hearing, service, or guide dogs or an organization generally recognized by agencies involved in the rehabilitation of individuals with disabilities as reputable and competent to provide dogs with training").

[15] *See* Finney & Yip, *supra* note 1.

[16] *See id.* (explaining that families left their dogs with trainers and their dogs died or were not returned).

about which tools, devices, and methodologies should be used and the positions of professional veterinary and animal behavior associations. Section C discusses recent and current efforts to implement professional licensing requirements for dog trainers.

A. The Dog Training Industry: An Overview

A wide range of tools, devices, and pedagogies are used in dog training and behavior modification in the United States. This Note uses the term dog training broadly to include both dog training and behavior modification. The term behavior modification is used more narrowly when referring to training that specifically addresses behavioral concerns, including behavior that stems from anxiety or fear.[17]

Dog training methodologies can be placed into three broad categories: 1) positive reinforcement training (sometimes referred to as reward-based, R+ training, or force-free training), 2) balanced training, and 3) correction-based training (also known as coercive training, traditional training, or old-school training).[18] Positive reinforcement training primarily utilizes *positive reinforcement*—a principle of operant conditioning whereby a favorable behavior is increased because of the application of a favorable stimulus (e.g., rewarding a desired behavior with a treat increases the likelihood of that behavior being performed).[19] Positive reinforcement training focuses on teaching, rewarding, and reinforcing desired behaviors rather than punishing or correcting unwanted behaviors (i.e., "teaching [a] dog what *to* do, rather than

[17] *See, e.g.*, *Changing Behaviors*, Am. Animal Hosp. Ass'n, https://www.aaha.org/aaha-guidelines/behavior-management/changing-behaviors/ (May 10, 2019) (explaining different principles of behavior modification, including desensitization and counterconditioning).

[18] *See* Anthony De Marinis, *Dog Training Methods and Beliefs – What Are the Differences?*, De Marinis Dog Training & Behav. (July 3, 2023), https://demarinisdogtraining.com/dog-training-methods-and-beliefs-what-are-the-differences/.

[19] *See, e.g.*, Jessica B. Greenebaum, *Training Dogs and Training Humans: Symbolic Interaction and Dog Training*, 23 Anthrozoös 129, 133 (2010) (explaining the four quadrants of operant conditioning and that "[r]eward-based training uses the techniques of positive reinforcement and negative punishment as a way to reward behavior and as a way to build a trusting relationship" with a dog). This Note does not explore the full nuances of dog training, but it is important to note that trainers may utilize other techniques, in addition to principles of operant conditioning, including classical conditioning, desensitization, and counterconditioning. *See, e.g.*, Ellen Lindell, Monique Feyrecilde, Debra Horwitz, & Gary Landsberg, *Introduction to Desensitization and Counterconditioning*, VCA Animal Hosps., https://vcahospitals.com/know-your-pet/introduction-to-desensitization-and-counterconditioning%20 (last visited Mar. 16, 2025).

what *not* to do").[20] Balanced training is a broad category of training methodologies and beliefs and generally incorporates punishment-based or corrective training approaches—*positive punishment* and *negative reinforcement*—alongside positive reinforcement.[21] Positive punishment and negative reinforcement involve the application or removal, respectively, of a noxious, unpleasant, or painful stimulus to modify a behavior, and are generally understood to be aversive in nature.[22] That is, in addition to using rewards, balanced training incorporates different forms of punishment or correction to "teach, stop, manage or correct a behavior."[23] Lastly, correction-based training, or old-school training, relies heavily on punishment and correction-based methods.[24] Dog training methods that intentionally use punishment and correction-based methods may rely on outdated theories like dominance theory, which can be associated with words like "alpha" or "pack leader."[25] The popular debate tends to center around positive-reinforcement training versus balanced training.[26]

Some trainers follow a *Least Intrusive, Minimally Aversive* (LIMA) philosophy.[27] A LIMA philosophy seeks to use the least aversive means possible for an individual dog in a particular situation, increase the use of positive reinforcement, and eliminate punishment or correction-based methods.[28] It is important to note that substantial variation in

[20] De Marinis, *supra* note 18.

[21] *See, e.g.*, *What Is the Difference Between Operant Conditioning and Classical Conditioning?*, The Dog Wizard, https://thedogwizard.com/blog/difference-between-operant-and-classical-conditioning/ (last visited Dec. 18, 2023) (explaining that a "balanced training philosophy" applies all four quadrants of operant conditioning, creating a "balance between positive and negative consequences").

[22] Greenebaum, *supra* note 19, at 133; *see also* Zazie Todd, *Dog Training Methods Affect Attachment to the Owner*, Am. Veterinary Soc'y of Animal Behav. (Feb. 5, 2020), https://avsab.org/dog-training-methods-affect-attachment-to-the-owner/.

[23] De Marinis, *supra* note 18.

[24] *Id.*

[25] *See, e.g.*, *Position Statement on the Use of Dominance Theory in Behavior Modification of Animals*, Am. Veterinary Soc'y of Animal Behav. (2008), https://avsab.org/wp-content/uploads/2019/01/Dominance_Position_Statement-download.pdf; *see also* S.J. Evans, *Dominance – When an Outdated Theory Won't Go Away*, Veterinary Prac. (July 15, 2022), https://www.veterinary-practice.com/article/dominance-when-an-outdated-theory-wont-go-away.

[26] *See, e.g.*, Alicia Wittmeyer, *My Year of Being Extremely Online About Dogs*, N.Y. Times (Dec. 24, 2023), https://www.nytimes.com/2023/12/20/opinion/dogs-culture-wars.html.

[27] De Marinis, *supra* note 18.

[28] *Id.*; *see also Least Intrusive, Minimally Aversive (LIMA) Effective Behavior Intervention Policy*, Certification Council for Pro. Dog Trainers, https://www.ccpdt.org/about-us/least-intrusive-minimally-aversive-lima-effective-behavior-intervention-policy/ (last visited Mar. 16, 2023).

philosophies and methodologies can exist between trainers within each pedological branch.[29] While terminology used in dog training is fairly standard, variation does exist, especially outside of the literature.[30]

A wide variety of tools and devices are available to dog trainers and consumers alike. These include: harnesses (e.g., front clip, back clip, Y-shaped, H-shaped), flat collars, head halters (i.e., Gentle Leaders or haltis), martingale collars (i.e., limited slip collars), slip leashes, slip chains (also referred to as choke chains or pulling collars), prong collars, electronic vibration-only collars, bark-activated spray collars (e.g., citronella collars), bark-activated ultrasonic collars, other ultrasonic anti-bark devices, electric collars associated with electric fencing (also referred to as wireless fencing, in-ground fencing, or pet containment systems), bark-activated electric collars (also known as bark collars, shock collars), and human/remote-activated electric collars (also known as shock collars, E-collars, or electrical or electronic shock collars).[31] This list progresses from tools and devices that are generally not considered aversive, to tools and devices that are generally considered more invasive and more aversive.[32] Positive reinforcement trainers generally rely on equipment including harnesses, flat collars, or head halters.[33] Balanced trainers may incorporate more aversive or correction-based equipment, including slip leads, prong collars, and electric collars.[34]

B. Positive Reinforcement Versus Balanced Training: Arguments and Positions

Generally, positive reinforcement trainers argue that reward-based training is the only type of dog training that is humane, effective, and evidence-based.[35] Balanced trainers may argue that dogs learn

[29] De Marinis, *supra* note 18.

[30] *See* Zazie Todd, *Barriers to the Adoption of Humane Dog Training Methods*, 25 J. Veterinary Behav. 28, 29 (2018) (explaining that the public generally does not study learning theory and that definitions outside of the literature are not always well defined).

[31] *See, e.g.*, *Which Type of Collar Is Best for Your Dog?*, Humane Soc'y of the U.S., https://www.humanesociety.org/resources/dog-collars (last visited Dec. 7, 2023).

[32] *See, e.g.*, De Marinis, *supra* note 20 (describing the different equipment used in different training methodologies).

[33] *Id.*

[34] *Id.*

[35] *See, e.g.*, *Position Statement on Humane Dog Training*, Am. Veterinary Soc'y of Animal Behav. (2021), https://avsab.org/wp-content/uploads/2021/08/AVSAB-Humane-Dog-Training-Position-Statement-2021.pdf (explaining that research supports the use of reward-based training for all types of dog training, including behavioral issues and that evidence shows the use of aversive methods and tools are associated with acute and long-term negative impacts on animal welfare).

better when positive reinforcement is used in conjunction with aversive, correction-based methods.[36]

Professional veterinary, veterinary behavior, and animal behavior associations in and outside of the United States support and recommend the use of reward-based training and advise against the incorporation of aversive correction. The American Veterinary Society of Animal Behavior (AVSAB) explains that "[c]urrent literature on dog training methods shows a clear advantage of reward-based methods over aversive-based methods with respect to immediate and long-term welfare, training effectiveness, and the dog-human relationship."[37] AVSAB explains that obedience levels have been observed to be highest in dogs trained "exclusively with reward-based methods and lowest for dogs trained exclusively with aversive-based methods."[38] Balanced-training has been shown to produce "lower obedience levels than reward-based [training] but better than exclusively aversive-based training."[39] According to AVSAB, "[a]versive training has been shown to impair dogs' ability to learn new tasks."[40] AVSAB rejects the applicability of dominance theory in dog behavior modification and is concerned with its re-emergence in modern dog training.[41]

According to the American College of Veterinary Behaviorists (ACVB), "[a]versive training methods can be dangerous to people as well as animals and pose a threat to animal welfare by inhibiting learning, increasing behaviors related to fear and distress, and causing direct injury."[42] Likewise, the British Veterinary Association (BVA) and the British Small Animal Veterinary Association (BSAVA) "support and recommend positive training methods as the most effective training intervention for companion animals in terms of health, welfare and behavioural outcomes."[43]

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[36] *See, e.g.*, *Balanced Dog Training: Best of Both Worlds*, Thriving Canine, https://www.thrivingcanine.com/Balanced_Dog_Training (last visited Dec. 15, 2023) (arguing that "'[b]alanced' or 'Integrated' dog training reaches across the aisle and creates enthusiastic, happy dogs by training with rewards but also produces fast results and reliability by layering in the use of physical pressure and corrections").

[37] *Position Statement on Humane Dog Training*, *supra* note 35.

[38] *Id.*

[39] *Id.*

[40] *Id.*

[41] *Position Statement on the Use of Dominance Theory in Behavior Modification of Animals*, Am. Veterinary Soc'y of Animal Behav. (2008), https://avsab.org/wp-content/uploads/2019/01/Dominance_Position_Statement-download.pdf.

[42] *Position Statements*, Am. Coll. of Veterinary Behaviorists, https://www.dacvb.org/page/PositionStatement (last visited Dec. 7, 2023).

[43] *BVA and BSAVA Policy Position on the Use of Aversive Training Devices in Dogs and Cats*, Brit. Veterinary Ass'n, https://www.bva.co.uk/media/1155/exec-summary-bva-policy-position-on-the-use-of-aversive-training-devices-in-dogs-and-cats.pdf (last visited Dec. 7, 2023).

According to the Canadian Veterinary Medical Association, "[a]versive [training] methods are strongly discouraged [because] they do not address the underlying cause of the undesired behaviour and may cause fear, distress, anxiety, pain or physical injury to [dogs]."[44] The Australian Veterinary Association explains:

> Animals develop increased stress responses when exposed to training using positive punishment and negative reinforcement[], especially in the hands of people who do not have an advanced understanding of animal behaviour. The freeze response and learned helplessness can be confused with a calm and compliant animal who is happy to obey[].[45]

Similarly, the International Association of Animal Behavior Consultants (IAABC) explains that "[s]cientific research has clearly established that best practices in animal training and behavior require positive reinforcement-based strategies."[46] The IAABC states that "positive reinforcement is associated with the lowest incidence of aggression, attention seeking, avoidance, and fear in learners."[47] Accordingly, the Animal Behaviour & Training Council "believes that it cannot be right to cause any animal pain in order to motivate them to carry out desired behaviours, when humane methods are not only available, but produce better long-term results."[48]

Lastly, the Standards of Practice for Animal-Assisted Interventions, a publication endorsed by Pet Partners, the Human Animal Bond Research Institute (HABRI), the Association of Animal-Assisted Intervention Professionals, and the University of Denver Institute for Human-Animal Connection, among others, states that

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[44] *Position Statements*, Canadian Veterinary Med. Ass'n (Sept. 17, 2021), https://www.canadianveterinarians.net/policy-and-outreach/position-statements/statements/humane-training-of-dogs/.

[45] *The Use of Punishment and Negative Reinforcement in Dog Training*, Australian Veterinary Ass'n (Nov. 5, 2021), https://www.ava.com.au/policy-advocacy/policies/companion-animals-dog-behaviour/the-use-of-punishment-and-negative-reinforcement-in-dog-training/.

[46] *IAABC Position Statement: Regulation in Animal Training and Behavior*, Int'l Ass'n of Animal Behav. Consultants, https://iaabc.org/regulation-in-animal-training-and-behavior (last visited Mar. 15, 2025).

[47] *IAABC Statement on LIMA*, Int'l Ass'n of Animal Behav. Consultants, https://web.archive.org/web/20250109023929/https://iaabc.org/en/lima (last visited July 3, 2024).

[48] *The Animal Behaviour and Training Council – A Registered Charity*, Animal Behav. & Training Council (2025), https://abtc.org.uk.

"[t]raining of any kind should use force-free techniques. Equipment that [is] used for training and handling should be equally force-free, and the use of slip, spray, shock, or prong collars…should be avoided."[49] The standards intend to "ensure the safety of therapy animals, handlers, and clients" and maintain the "highest standards of ethical behavior."[50]

C. Recent and Current Efforts to Regulate the Dog Training Industry

To address the problems posed by a lack of regulation in the industry, a small number of states have attempted to or are attempting to require professional licensure for dog trainers. In 2022, California became the first state to regulate companion dog trainers in any capacity.[51] AB-1901 was introduced in the California state legislature after journalists highlighted the stories of dogs who had been abused, disappeared, or died while in the care of a dog trainer.[52] AB-1901 requires dog trainers to disclose any civil judgments against them related to their dog training services.[53] AB-1901 also requires dog trainers to disclose any convictions of criminal animal cruelty against themselves or any employees involved in the dog training process.[54]

Several additional disclosure requirements, however, were struck from the final version of the bill. The original version of the bill would have required that dog trainers disclose whether they are licensed or certified by an animal training organization.[55] It also would have required that dog trainers disclose the types of techniques they use, such as whether they use "negative reinforcement or shock collars."[56] Further, it would have required trainers to disclose a "record of any injur[ies] sustained by dogs in their care."[57]

Several comments were made on early drafts of the bill.[58] One comment noted that the original version of the bill would have regulated

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[49] *Standards of Practice for Animal-Assisted Interventions*, Standards of Prac. in Animal-Assisted Interventions (Sept. 1, 2021), https://therapyanimalstandards.org/__static/ae18e35bfd13b99794e575b6efce7ab6/aaistandardsofpractice.pdf?dl=1.

[50] *Id.*

[51] *See* Dog Trainer Sufficiency Act, A.B. 1901, Cal. State Assemb. (Cal. 2022) (enacted Sept. 13, 2022) (codified at Cal. Health & Safety Code § 122395).

[52] Finney & Yip, *supra* note 1.

[53] Cal. Health & Safety Code § 122395.2(a)(2).

[54] Health & Safety § 122395.2(a)(3).

[55] A.B. 1901, Cal. State Assemb. (Cal. 2022) (as amended on Mar. 24, 2022).

[56] *Id.*

[57] *Id.*

[58] *Dog Training Services and Facilities: Requirements: Hearing on A.B. 1901 Before the Assemb. Comm. On Business and Professions*, Cal. State Assemb. (Cal. 2022).

all dog training facilities as if they provided overnight care to dogs (as in "board and train" programs).[59] This was problematic because many trainers offer only brief sessions to clients.[60] In a committee hearing on the bill, the American Kennel Club (AKC) and the San Diego Humane Society also argued that language in the original version of the bill was vague.[61] They stated that some terminology like "negative reinforcement" was not well defined.[62] They argued that this demonstrated a lack of understanding as to the complexities of behavior science and operant conditioning.[63] Lastly, according to a local news outlet, a provision that would have required dog trainers to disclose whether they were licensed or certified was removed from the bill after intense lobbying from the AKC.[64]

Before California's AB-1901, Massachusetts, in 2020, introduced Senate Bill 118 to require that dog trainers meet professional licensing requirements.[65] This bill would have established a dog trainer licensure board within the state's Division of Professional Licensure, and would have required minimum education, examination, and continuing education requirements for dog trainers.[66] Additionally, in Vermont, H.57 would have "require[d] a dog trainer to inform a client of the methods and equipment that [would] be used to train the client's dog and of the risks and benefits of those methods and equipment."[67] The bill would have required that a trainer obtain a client's consent to that training.[68] Both bills died in committee and have not yet been reintroduced.[69]

Proposed legislation in New Jersey and Illinois would require professional licensure for dog trainers.[70] Like Massachusetts' S.118, New Jersey's S67 and Illinois' SB1372 would establish a state dog

[59] *Id.*

[60] *Id.*

[61] *Id.*

[62] *Id.*

[63] *Id.*

[64] Finney & Yip, *supra* note 1 (noting that Judie Mancuso, of Social Compassion in Legislation (SCIL), questioned AKC's motives for doing so, adding that the AKC has made alliances with "the National Rifle Association, the Farm Bureau and the Cattlemen's Association").

[65] S. 118, 191st Gen. Ct. (Mass. 2019).

[66] *Id.*

[67] H.57, 2023-2024 Gen. Assemb., Reg. Sess. (Vt. 2023).

[68] *Id.*

[69] *See H.57 An Act Relating to Requiring Dog Trainers to Obtain Informed Client Consent*, Vt. Gen. Assemb., https://legislature.vermont.gov/bill/status/2024/H.57 (last visited Apr. 1, 2025); *Bill S.118: An Act Relative to the Licensure of Dog Trainers*, Commonwealth of Mass. (2025), https://malegislature.gov/Bills/191/S118.

[70] *See* S. 67, 221st Leg., Reg. Sess. (N.J. 2024); S.B. 1372, 103rd Gen. Assemb., Reg. Sess. (Ill. 2023).

trainer licensure board and require minimum education, examination, and continuing education requirements for dog trainers.[71]

In sum, a small number of states have made or are making efforts to regulate the dog training profession. However, the field remains largely unregulated. In addition to efforts to regulate the profession, efforts have also been made to regulate devices used within the industry.

II. Case Study: The Use of Electric Shock Collars in Dog Training

The proliferation of aversive devices in dog training is tied to a lack of regulation in the industry. Electric collars—devices that emit and deliver an electric shock to a dog—are one such category of device. This Part examines electric shock collars used in dog training as a case study that highlights the lack of regulation in the industry. The term "electric collar" in this Section is used broadly to capture the breadth of these devices, including remote-activated electric collars, bark-activated electric collars (also referred to as bark-collars), and electronic containment systems (also known as wireless fencing). GPS-only electronic collars do not emit or deliver an electric shock to a dog and are not considered a type of electric collar.

Section A of this Part examines the history and evolution of electric collars. Section B discusses the regulatory history of electric collars. Section C analyzes current efforts to regulate these devices. Section D provides a comparative analysis of electric collar regulations in other countries. And Section E discusses device regulation in other nonhuman animal industries like rodeo, animal agriculture, and zoos.

A. Electric Collars: History, Evolution, and Concerns

The use of electric collars is the most controversial practice in the dog training industry. These devices first came on the market around the 1950s and 1960s.[72] For decades, electric collars were mostly confined to hunting dog circles—the devices were generally not marketed

[71] *See* S. 67, 221st Leg., Reg. Sess. (N.J. 2024); S.B. 1372, 103rd Gen. Assemb., Reg. Sess. (Ill. 2023).

[72] *See, e.g.*, Ted Gartner, *The History and Evolution of the E-Collar*, Quail Forever: The Habitat Org. (June 11, 2019), https://quailforever.org/BlogLanding/Blogs/Quail-Forever/The-History-and-Evolution-of-the-E-Collar.aspx (Although more reliable sources documenting the history of electric collars have not been found, the oral history of electric collars is relatively consistent, understanding the devices to have come to market around 1960. Here, the source is discussing early advertisements of electric collars in mail-order catalogs in the 1960s.).

to everyday dog guardians.[73] Today, these devices are marketed to consumers as everyday companion animal training aids.[74]

The consensus among professional veterinary and animal behavior associations is that the use of aversive devices like electric collars is detrimental to the welfare of dogs and to the human-canine bond and should be avoided.[75] According to the American Veterinary Society of Animal Behavior (AVSAB), aversive-based training methods can have both acute and long-term effects on well-being.[76] Acute effects of electric collar use include reactions indicative of stress, fear, or pain, including lowered body posture (lowered ears or tail), tongue flicking, avoidance, redirected aggression, and yelping.[77] Regarding long-term effects, AVSAB explains, "[s]urvey studies have shown an association between the use of aversive training methods and long-term behavior problems including aggressive behavior towards people and other dogs, and anxiety-related behaviors such as avoidance and excitability."[78] In the consumer sphere, however, electric collars appear to be subject to frequent humane-washing and misinformation.[79] The devices may also

[73] *See id.* (explaining that early electric collars were marketed in a mail-order hunting catalog)*; see also* Chad Culp, *E-Collar: History Evolution and Controversy*, Thriving Canine (Dec. 30, 2021), https://www.thrivingcanine.com/blog/2021/12/29/e-collar-history-evolution-and-controversy (explaining that the early devices were "not a tool that was being marketed to pet owners" and that the high cost associated with the early devices largely restricted the devices to hunting dog enthusiasts).

[74] *See, e.g.*, *Educator Trainers, the World's Best E-Collar*, E-Collar Techs., Inc., https://www.ecollar.com/ (last visited Dec. 12, 2024) (marketing electric shock collars as "Educators").

[75] *See, e.g.*, *Position Statement on Humane Dog Training*, *supra* note 35 (explaining that "[c]urrent literature on dog training methods shows a clear advantage of reward-based methods over aversive-based methods with respect to immediate and long-term welfare, training effectiveness, and the dog-human relationship"); *see also Position Statements*, *supra* note 42 ("Aversive training methods can be dangerous to people as well as animals and pose a threat to animal welfare by inhibiting learning, increasing behaviors related to fear and distress, and causing direct injury.").

[76] *Position Statement on Humane Dog Training*, *supra* note 35.

[77] *Id.*; *see also* Matthijs B.H. Schilder & Joanne A.M. van der Borg, *Training Dogs with Help of the Shock Collar: Short and Long Term Behavioural Effects*, 85 Applied Animal Behav. Sci. 319, 325 (2004).

[78] *Position Statement on Humane Dog Training*, *supra* note 35.

[79] *See, e.g.*, Testimony, S.B. 677, 30th Leg., Reg. Sess. (Haw. 2019) at 9 (arguing that electric shock collars are not "shock" collars and are "in no way harmful"); *see also About Us*, E-Collar Techs., https://www.ecollar.com/about-us/ (last visited Mar. 15, 2025) ("[Electric collars are] designed to get your dog's attention, not as form of punishment" and that electric collars do not cause "physical harm or lasting damage to a dog as a form of punishment."); *see also So You've Heard About E-Collars*, Flash Dog Training, https://www.flashdogtraining.com/ecollar/ (last visited Dec. 15, 2023) ("The modern E-collar is no longer a unit that produces static shock, but rather blunt stimulation. Today, the E-collar is virtually a tens-unit similar to what is used in acupuncture, massage, and physical therapy.").

be subject to disinformation and false advertising.[80]

For example, electric collars are the subject of a class action lawsuit in the California case of *Hernandez v. Radio Systems Corporation*.[81] The suit, filed in 2022, alleges that Radio Systems Corporation, which produces PetSafe brand products, falsely and misleadingly advertised its electric collar products as "safe."[82] Hernandez brought the suit after his dog allegedly sustained physical and psychological injuries caused by the normal and anticipated use of the devices.[83] The case asserted causes of action under California's Consumer Legal Remedies Act, False Advertising Law, and Unfair Competition Law.[84] In March of 2023, the U.S. District Court for the Central District of California denied a motion to dismiss the case for failure to state a claim, explaining that "[d]efendant's representations of its PetSafe Products as 'safe' and 'harmless' [were] not puffery" and that "a reasonable consumer could be misled into believing that the PetSafe Products would not cause any physical or psychological harm to pets."[85] The parties reached an agreement in principle to settle the case on February 5, 2025.[86]

Another concern is that dog trainers have been documented using multiple electric collars, simultaneously, on a single dog,[87] including placing an electric collar around the "hindquarters" of a dog.[88] For example, in *Moore v. People for the Ethical Treatment of Animals*, the court found that the following statement was substantially true: "[o]ne [shock collar] was around the neck, and then one was around the genitals. [The trainer] proceed[ed] to go around the entire perimeter of the park zapping the dog every five seconds. The [bichon frisé] practically lifted off the ground. It was extremely disturbing."[89]

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[80] *See, e.g.*, Hernandez v. Radio Sys. Corp., No. EDCV 22-1861 JGB, 2023 WL 4291829, at *2 (C.D. Cal. May 10, 2023) (alleging that electric collars were falsely advertised as "safe").

[81] *Id.* at *1.

[82] *Id.* at *2.

[83] *Id.*

[84] Order 1) Granting-in-Part and Denying-in-Part Defendant's Motion to Dismiss (Dkt. No. 22), and 2) Vacating the March 13, 2023 Hearing at 1, Hernandez v. Radio Sys. Corp., No. EDCV 22-1861 JGB (C.D. Cal. March 9, 2023), ECF No. 28.

[85] *Id.* at 7.

[86] Joint Notice of Settlement at 2, Hernandez v. Radio Sys. Corp., No. EDCV 22-1861 JGB (C.D. Cal. Feb. 5, 2025), ECF No. 124.

[87] *See, e.g.*, Pacher v. Invisible Fence of Dayton, 798 N.E.2d 1121, 1129 (Ohio Ct. App. 2003) ("The injury occurred a short time after [the trainers] placed two collars on [the dog] and significantly increased the shock that was applied.…Pictures show[ed] blackened areas on the dog's skin, where the prongs were located, consistent with a burn.").

[88] Moore v. People for the Ethical Treatment of Animals, Inc., 932 N.E.2d 448, 457 (Ill. App. Ct. 2010).

[89] *Id*. at 456.

B. Regulatory History

Electric collars are currently unregulated but have received attention from the U.S. Food and Drug Administration (FDA) in the past. In 1980, the FDA's Center for Veterinary Medicine (CVM), which regulates, inter alia, medical devices intended for nonhuman animals, issued a Compliance Policy Guide (CPG) for bark-activated electric collars: CPG § 655.300.[90] The background information for the policy states:

> A veterinary device which has been the subject of regulatory attention is a dog collar which is activated by barking resulting in an electric shock to the dog which supposedly trains him to stop barking. []CVM[] believes the collars fall under the definition of a device since they are intended to affect barking, which is a natural dog function. Complaints received, which were later corroborated by our own testing, included severe burns in the collar area and possible personality adjustment injuries to the dogs. The shocking mechanism was found to be activated not only by barking but by vehicle horns, slamming doors or any other loud noise. []CVM[] concurred in regulatory action against the device since it was deemed to be dangerous to the health of the animal.[91]

In response, the CVM's policy position advised that "[d]og collars which are activated by the noise of barking to produce an electric shock are considered as hazardous to the health of the animal."[92] The CVM stated that it "concurred in regulatory action against the device."[93] The action that the CVM took, however, is unclear. The CVM revised the policy in 1987 and withdrew the policy in 2020.[94] The revisions made to the policy in 1987 are unknown. The CVM did not provide a specific reason for the policy's withdrawal but noted it was withdrawn alongside several other policy guides because the policies were "outdated, duplicative, or not in line with the Center and Agency's current thinking."[95]

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[90] *Compliance Policy Guide Sec. 655.300 Barking Dog Collar*, U.S. Food & Drug Admin. (Feb. 20, 2020), https://www.fda.gov/regulatory-information/search-fda-guidance-documents/cpg-sec-655300-barking-dog-collar-withdrawn-2202020.

[91] *Id.* (emphasis added).

[92] *Id.*

[93] *Id.*

[94] *Compliance Policy Guide Sec. 655.300 Barking Dog Collar*, *supra* note 90.

[95] E-mail from Ctr. for Veterinary Med. Compliance to Krista Wirth (Oct. 24, 2023, 3:21 PM) (on file with author).

While not directly regulating electric collars, some states and tribal nations have laws that prohibit the removal, destruction, or tampering of "electronic" or "electric" collars that were placed on a dog by their owner, including Tennessee, Missouri, New Hampshire, Georgia, California, Virginia, Iowa, North Carolina, South Carolina, and the Eastern Band of Cherokee Indians.[96] Most of these laws focus on "electronic or radio transmitting" collars and appear to deter the theft of dogs.[97] For example, Georgia's law defines "collar" to mean "any electronic or radio transmitting collar that has the *purpose of tracking the location of a dog*."[98] However, some laws are broader and more clearly include electric shock collars, such as Iowa's law, which criminalizes the removal of "an electric device designed and used to maintain custody or control of the dog *or modify the dog's behavior*."[99] South Carolina's law more generally makes it unlawful to remove "an electronic collar or other electronic device."[100]

Two states have laws that restrict the ability of state and local governments to regulate "electronic locating collars," which could include dual-purpose electric collars.[101] Under Tennessee law, "[n] o agency or entity of state or local government shall enact, adopt, promulgate, or enforce any law, ordinance, rule, regulation, or other policy that restricts or prevents the owner of any dog from using an electronic locating collar to protect the dog from loss[.]"[102] Similarly, Idaho law states, "[n]o entity of state or local government may by ordinance or regulation prevent the owner of any dog from protecting it from loss by the use of an electronic locating collar."[103]

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[96] *See, e.g.*, Tenn. Code Ann. § 39-14-213 (2007) (making it unlawful to "remove[] from a dog an electronic or radio transmitting collar…without the permission of the owner of the dog and with the intent to prevent or hinder the owner from locating the dog."); Mo. Rev. Stat. § 578.028 (2017); N.H. Rev. Stat. Ann. § 466:42-a (2022); Ga. Code Ann. § 4-8-6.1 (2008); Cal. Fish & Game Code § 2011.5 (West 2010) (applying only to "hunting dogs"); Va. Code Ann. § 18.2-97.1 (2011); Iowa Code § 351.46 (2020); N.C. Gen. Stat. § 14-401.17 (2005); S.C. Code Ann. § 50-11-785 (2024); Eastern Band Cherokee Indians Code § 19-6 (2010).

[97] *See, e.g.*, Tenn. Code Ann. § 39-14-213 (2007) (making it unlawful to "remove[] from a dog an *electronic* or *radio transmitting collar*…without the permission of the owner of the dog and with the *intent to prevent or hinder the owner from locating the dog*." (emphasis added)).

[98] Ga. Code Ann. §4-8-6.1 (2008) (emphasis added).

[99] *See* Iowa Code § 351.46 (2020) (emphasis added).

[100] S.C. Code Ann. § 50-11-785 (2024) ("It is unlawful to intentionally remove or destroy an electronic collar or other electronic device placed on a dog by its owner.").

[101] Some electronic collars have dual purpose "tracking and training" functions. *See, e.g.*, TT™ 15X Dog Collar, Garmin, https://www.garmin.com/en-US/p/856402 (last visited July 2, 2024).

[102] Tenn. Code Ann. § 44-17-401 (2012).

[103] Idaho Code § 25-2807 (1991).

C. Recent Efforts to Regulate Electric Collars

Efforts to regulate electric collars have occurred at the state and local levels. In 2019, Hawaii introduced a bill to ban electric collars alongside the tethering of dogs.[104] The bill would have prohibited the sale, distribution, and use of "electric shock dog collars" in Hawaii, citing the negative impact of aversive devices on dog welfare and that several countries had banned the devices.[105] The Hawaii legislature received substantial testimony on the measure, particularly regarding the electric collar ban, with parties advocating both for and against the provision.[106] In the subsequent legislative session, the provision banning electric collars was removed, and the bill was ultimately passed without the device ban.[107] The definition of "electric shock dog collar" in the bill was broad, encompassing "any e-collar or electric collar meant to be used around a dog's neck to deliver an electric shock to the dog."[108]

Similarly, in the 2021-2022 legislative session, New York introduced a bill to ban the sale and distribution of "electric shock dog collars."[109] The bill would have amended the general business law and made it unlawful for "any person, firm, or partnership or corporation to knowingly sell, offer for sale or distribut[e] for sale in the state any electric shock dog collar."[110] Violating the provision would have been punishable by a fine.[111] The bill was not passed and as of May 2025, has yet to be reintroduced.[112]

Efforts to ban electric collars have also been made at the local level.[113] In 2022, the San Francisco Commission of Animal Control and

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[104] S.B. 677, 30th Leg., Reg. Sess. (Haw. 2019).

[105] *Id.*

[106] *Testimony Submitted for Hearing on S.B. 677 Before the S. Comm. on Judiciary*, 30th Leg., Reg. Sess. (Haw. 2020), https://www.capitol.hawaii.gov/sessions/session2020/testimony/SB677_Testimony_JDC_02-07-20_.PDF.

[107] Michael Brestovansky, *Proposal Would Broaden Hawaii's Animal Cruelty Laws*, West Haw. Today (Feb. 8, 2020, 12:05 AM), https://www.westhawaiitoday.com/2020/02/08/hawaii-news/proposal-would-broaden-hawaiis-animal-cruelty-laws/.

[108] S.B. 677, 30th Leg., Reg. Sess. (Haw. 2019).

[109] A.B. 10700, 204th Gen. Assemb. (N.Y. 2022) (defining "electric shock dog collars" as "any e-collar or electric collar meant to be used around a dog's neck to deliver an electric shock to the dog").

[110] *Id.*

[111] *Id.*

[112] *Id.*

[113] *See* Letter from San Francisco Animal Control and Welfare Comm'rs, *RE: Proposed Legislation Banning the Use and Sale of Dog Training Shock Collars in San Francisco*, Comm'n of Animal Control & Welfare, to Dean Preston (Nov. 10, 2022), https://sf.gov/sites/default/files/2022-11/Animal Commission Shock Collar Ban Letter.pdf; *see also* Alex Burness, *Boulder Trainer Eyes Ballot Measure Banning Choke, Prong and Shock Collars on Dogs*, Daily Camera (Dec. 23, 2017), https://www.dailycamera.com/2017/12/23/boulder-trainer-eyes-ballot-measure-banning-

Welfare voted to support a proposal to ban the sale and use of electric collars in San Francisco, California.[114] In a letter to the San Francisco Board of Supervisors expressing its support of the ban, the Commission explained, "there [is] ample evidence that supports positive reinforcement training is the most effective and humane approach to training and behavior modification. Research shows that adverse behavior training techniques, such as the use of shock collars, increase[s] the risk of fear, anxiety, and aggression in dogs."[115]

Bans on electric collars are also seen at the industry level.[116] In 2020, Petco, a large retailer in the pet products industry, took the unprecedented step of ending the sale of "electronic 'shock' collars."[117] This ban included remote-activated and bark-activated electric collars but not electric fencing or containment systems.[118] Petco called on others in the industry to follow suit and support "responsible regulation for the retail sale of shock collars to general consumers."[119] Petco CEO Ron Coughlin explained, "[s]hock collars have been shown to increase fear, anxiety and stress in dogs, and we believe there's a better way."[120]

Lastly, at the federal level, the Transportation Security Administration (TSA), in its recommended standards for acquiring explosive detection canines, recommends that any dogs having been subjected to "forced fetch, *electronic collar training*, or the use of some form of *compulsion* in an effort to force a canine to pick up or retrieve an object" be immediately disqualified as potential candidates.[121]

D. Electric Collar Regulation in Other Countries

Several countries have banned the use of electric collars or are proposing such bans. Countries and provinces that have banned

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choke-prong-and-shock-collars-on-dogs/ (discussing a proposed ballot measure in Boulder, Colorado).

[114] *RE: Proposed Legislation Banning the Use and Sale of Dog Training Shock Collars in San Francisco*, *supra* note 113.

[115] *Id.*

[116] *See Stop the Shock: Petco Ends the Sale of Electronic "Shock" Collars, Firmly Establishes Itself as the Health and Wellness Company for Pets*, Petco (Oct. 6, 2020), https://corporate.petco.com/2020-10-06-Stop-the-Shock-Petco-Ends-the-Sale-of-Electronic-Shock-Collars-Firmly-Establishes-itself-as-the-Health-and-Wellness-Company-for-Pets.

[117] *Id*.

[118] *See id.*; *PetSafe Basic In-Ground Pet Fence*, Petco, https://www.petco.com/shop/en/petcostore/product/petsafe-basic-in-ground-fence-2311638 (last visited Mar. 16, 2025) (selling electronic containment systems).

[119] *Stop the Shock*, *supra* note 116.

[120] *Id.*

[121] Explosive Detection Canine Recommended Standards, 85 Fed. Reg. 16119 (Mar. 20, 2020) (emphasis added).

electric collars include: Austria, parts of Belgium, Denmark, Germany, Finland, Iceland, the Netherlands, Norway, Slovenia, Spain, Sweden, Switzerland, Quebec, Wales, and parts of Australia.[122] Some bans implement substantial penalties, including in the Netherlands, where those found in violation of the ban face a fine of up to twenty-thousand

[122] Todd, *supra* note 30 ("Austria, Germany, Denmark, Norway, Slovenia, Sweden, Switzerland, Quebec, [and] Wales…outlaw electronic shock collars…."); *Prohibit Shock Dog Collars Already Banned in Other States*, Queensland Parliament (June 6, 2023), https://www.parliament.qld.gov.au/Work-of-the-Assembly/Petitions/Petition-Details?id=3950 ("The collars are now banned in Denmark, Norway, Sweden, Austria, Switzerland and Germany."); Danica Van der Merwe, *Wallonia Bans Accessories that Cause Harm to Animals*, Brussels Times (Dec. 20, 2022), https://www.brusselstimes.com/340029/wallonia-bans-accessories-that-cause-harm-to-animals (prohibiting "electric collars, choke collars and spiked collars" in a region of Belgium, with limited exceptions for police and by veterinary certification); *The Animal Welfare Act Protects the Health and Well-Being of Dogs*, Kennelliitto, https://www.kennelliitto.fi/en/dog-ownership/animal-welfare-act-protects-health-and-well-being-dogs (last visited Apr. 23, 2025) (explaining that remote-activated, bark-activated, and electric fencing collars are prohibited under the Finnish Animal Welfare Act); *see* Guðný Hrönn, *Notkun Rafmagnsólarinnar Tilkynnt sem ill Meðferð til MAST*, Mannlíf (Jan. 17, 2019), https://gamla.mannlif.is/frettir/innlent/notkun-rafmagnsolarinnar-tilkynnt-sem-ill-medferd-til-mast/ ("electric shock belts are banned in Iceland and the use of the belt was reported to MAST as ill treatment"); *Netherlands to Ban Shock Collars for Dogs, Limit Breeding of 'Designer Cats'*, NL Times (Apr. 4, 2019), https://nltimes.nl/2019/04/04/netherlands-ban-shock-collars-dogs-limit-breeding-designer-cats (discussing the ban in the Netherlands); Ina-Kristin Lindin, Dømt for Bruk av Strømhalsbånd, NRK (Jan. 27, 2017), https://www.nrk.no/ostfold/domt-for-bruk-av-stromhalsband-1.13343560 ("[A] woman has been sentenced to 21 days in prison for using an electric collar on her dog."); *Rules on Pet Care Tightened Up*, Slovenia Times, https://sloveniatimes.com/27062/rules-on-pet-care-tightened-up (last visited Apr. 23, 2025) (discussing the ban in Slovenia); *Animal Welfare Regulations – Dog*, Jämtland Cnty. Admin. Bd. (2016), https://www.lansstyrelsen.se/download/18.8cd5a1b19362fb4fc2340d/1732539020220/Animal%20Welfare%20Regulations%20-%20Dog.pdf (discussing the ban in Sweden); *Illegal Dog Training Aids*, Stiftung für das Tier im Recht (May 10, 2021), https://www.tierimrecht.org/en/news/news-2021/2021-05-10-illegal-dog-training-aids/# (discussing the Swiss ban: "It is prohibited to use aversive dog training devices that give an electric shock, emit unpleasant sounds for the animal or dispense chemical substances."); Billy Shields, *Quebec Takes Steps to Protect Pets from Shock Collars, Prongs*, Global News (July 7, 2014), https://globalnews.ca/news/1437344/quebec-takes-steps-to-protect-pets-from-shock-collars-prongs/ (discussing the prohibition on prong and electric collars in Quebec with fines up to $36,000); *Electric Shock Collars*, The Kennel Club, https://www.thekennelclub.org.uk/about-us/campaigns/electric-shock-collars/ (last visited Apr. 22, 2025) ("Electric shock collars have been banned in Wales since 2010 under The Animal Welfare…Regulations 2010."); *Is the Use of Electronic Dog Collars Legal?*, Royal Soc'y for the Prevention of Cruelty to Animals, https://kb.rspca.org.au/knowledge-base/is-the-use-of-electronic-dog-collars-legal/ (Dec. 19, 2022) (listing states and territories in Australia where electric collars are prohibited or otherwise regulated) (Some jurisdictions like the Australian state of Victoria make exceptions to a general ban on the devices.).

euros or a maximum sentence of three years in prison.[123] Additionally, England, Northern Ireland, the Republic of Ireland, France, and the Scottish Animal Welfare Commission have expressed their intent to ban, or their support for a ban, on electric collars.[124] The Scottish Animal Welfare Commission has also recommended that Scottish ministers introduce legislation to require that dog trainers and behaviorists "follow a regulatory framework."[125] Moreover, while not explicitly banned by law, the Kennel Union of Southern Africa prohibits the use of electric collars and indicates that using the devices could be an offense under the Animals Protection Act No. 71 of 1962.[126] Singapore is also monitoring the use of electric collars and plans to issue guidance highlighting the risks associated with the devices.[127] Courts have upheld the ban

[123] *Netherlands to Ban Shock Collars for Dogs*, *supra* note 122.

[124] *Government Must Deliver on its Commitment to Ban Cruel Electric Shock Collars, Say Leading Veterinary and Animal Welfare Organizations*, British Veterinary Ass'n (Feb. 5, 2024), https://www.bva.co.uk/news-and-blog/news-article/government-must-deliver-on-its-commitment-to-ban-cruel-electric-shock-collars-say-leading-veterinary-and-animal-welfare-organisations/ (proposed ban in England); McConalogue *Announces Decision to Ban the Use of Remotely-Controlled Electronic Shock Collars on Dogs and Cats*, gov.ie (May 9, 2024), https://www.gov.ie/en/press-release/2111a-mcconalogue-announces-decision-to-ban-the-use-of-remotely-controlled-electronic-shock-collars-on-dogs-and-cats/; *Strengthening Animal Welfare a Top Priority, Says Muir*, All. (Dec. 12, 2024) (URL omitted); Jochebed Menon, *France Closer to Banning Electric Collars for Pets*, GlobalPETS (Jan. 25, 2023), https://globalpetindustry.com/news/france-closer-banning-electric-collars-pets/ (The proposed ban in France would establish penalties up to €15,000 and also prohibit prong collars.); *Dog Training – Use of Handheld Remote-Controlled Training Devices (E-Collars): Report*, Scottish Gov't (Apr. 11, 2023), https://www.gov.scot/publications/report-use-handheld-remote-controlled-training-devices-e-collars-dog-training-scottish-animal-welfare-commission/pages/7/ ("[T]he use of e-collars for the training of animals in Scotland should be prohibited….").

[125] *Dog Training – Use of Devices*, Scottish Gov't (Mar. 28, 2025), https://www.gov.scot/publications/report-use-devices-handheld-remote-controlled-electronic-devices-e-collars-shock-collars-training-dogs/pages/6/ ("Given the acknowledged potential for welfare harm through misuse or abuse of certain training devices, it is concerning that professional dog trainers and behaviourists are unregulated and are not legally required to understand, or have training in, animal welfare, learning theory or the harm/benefit analysis of aversive devices. SAWC recommends that the Scottish ministers introduce legislation that require dog trainers/behaviourists to follow a regulatory framework.").

[126] *Notice to Affiliated Clubs, Provincial Councils and National Sub Committees Re: Use of Training Dog Collars*, Kennel Union of S. Africa, https://www.kusa.co.za/index.php/news/kusa-news/3180-notice-to-affiliated-clubs-provincial-councils-and-national-sub-committees-re-use-of-training-dog-collars (last visited Apr. 23, 2025).

[127] *Written Answer by Ministry of National Development on Proposal for Ban on Remote Electric Shock Collars for Animals*, Singapore Ministry of Nat'l Dev. (Apr. 3, 2024), https://www.mnd.gov.sg/newsroom/parliament-matters/q-as/

in Wales, as well as a 2018 proposed ban on remote-activated collars in England, in legal challenges brought by Petsafe and the Electronic Collar Manufacturers Association.[128]

Several countries also prohibit other tools and devices used in dog training like prong collars and choke chains.[129] For example, prong collars have been banned in the Netherlands since 2018.[130] In 2022, Germany banned the use of "pulling collars," sending a subset of its police canines off duty until other training or handling arrangements could be made.[131] Additionally, in 2023, Spain passed an animal welfare law prohibiting the use of any tools and devices that may cause injury to companion animals, including "electric, impulse, punishment or choke collars."[132]

E. Device Regulation in Other Nonhuman Animal Industries

Device bans are also frequently seen in other nonhuman animal industries. In the rodeo industry, bans on electric prods and shocking devices can be found in city and county ordinances throughout California, New Jersey, New York, Ohio, Pennsylvania, and Texas.[133] The City of Pittsburgh, for instance, bans "any chemical, mechanical, electrical or manual device that will cause, or is likely to cause physical injury, torment or suffering," and specifically bans "electric prods or shocking devices, flank or bucking straps, wire tie-downs, and sharpened or fixed

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view/written-answer-by-ministry-of-national-development-on-proposal-for-ban-on-remote-electric-shock-collars-for-animals.

[128] *The Queen on the Application of Petsafe Ltd, The Electronic Collar Manufacturers Association v The Welsh Ministers*, Animal Legal & Hist. Ctr. (Nov. 16, 2010), https://www.animallaw.info/case/r-application-petsafe-ltd-v-welsh-ministers.

[129] *See, e.g.*, Ley 7/2023 art. 27 (BOE 2023, No. 75) (Spain), https://www.boe.es/boe/dias/2023/03/29/pdfs/BOE-A-2023-7936.pdf (Law 7/2023, of March 28, on the protection of animal rights and welfare (2023, No. 75) (Spain)).

[130] *The Negative Effects of the Electronic Collar on the Welfare of Dogs and Positive Training Methods as Alternatives*, Utrecht Univ. (Dec. 14, 2020), https://www.uu.nl/en/news/the-negative-effects-of-the-electronic-collar-on-the-welfare-of-dogs-and-positive-training-methods.

[131] *See, e.g.*, Kate Connolly, *German Police Dogs Sent off Duty After Ban on 'Pulling Collars'*, Guardian (Jan. 6, 2022), https://www.theguardian.com/world/2022/jan/06/german-police-dogs-sent-off-duty-after-ban-on-pulling-collars (explaining that police dogs were sent off duty in Germany after "pulling collars," which are used to restrict a dog's airway during protection work, were banned under a new anti-cruelty law).

[132] Ley 7/2023 art. 27 (BOE 2023, No. 75) (Spain), https://www.boe.es/boe/dias/2023/03/29/pdfs/BOE-A-2023-7936.pdf.

[133] Madison Steffey, *Overview of Rodeos*, Animal Legal & Hist. Ctr. (2018), https://www.animallaw.info/article/overview-rodeos.

spurs or rowels."[134] Other municipalities and legislatures are working on similar bans.[135] Electric shock is also used on agricultural animals outside of the rodeo industry.[136] Some international jurisdictions prohibit or restrict the use of devices like electric fencing, and others have called for bans on "electroshock equipment."[137]

Device bans are also seen in zoos. In 2019, the Association of Zoos and Aquariums (AZA) voted to prohibit the use of bullhooks on elephants.[138] The bullhook is a metal device resembling a fireplace poker that has traditionally been used to modify the behavior of elephants in captive settings by means of physical and psychological pain.[139] The move came after two states had banned the device.[140] Animal welfare organizations had long ago called for a bullhook ban.[141]

In sum, electric collars have received national and international attention at federal, state, local, and industry levels, but the devices remain largely unregulated in the United States. However, recognizing the welfare implications of aversive devices, many countries have banned electric collars and other devices used in dog training, and device bans are frequently seen in other nonhuman animal industries like the rodeo industry.

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[134] Pittsburgh, PA., Code of Ordinances § 635.04 (1992).

[135] *See e.g.*, Los Angeles, Cal., Ordinance 20-1575 (Dec. 7, 2022).

[136] *See* D. Grumett & A. Butterworth, *Electric Shock Control of Farmed Animals: Welfare Review and Ethical Critique*, 31 Cambridge Univ. Press 373, 373 (2022).

[137] *See, e.g.*, Joshua Becker, *Push to Overturn NSW's Virtual Fencing Ban, but RSPCA Opposes Giving 'Electric Shock' to Animals*, Australian Broad. Corp. (Jan. 31, 2024), https://www.abc.net.au/news/rural/2024-02-01/push-to-overturn-nsw-virutal-fencing-ban-but-rspca-opposes/103412610 (discussing jurisdictions in Australia that prohibit virtual fencing); *The Netherlands Seeks to Ban Use of Electric Prods in Livestock*, Pig (June 26, 2024), https://www.pig333.com/latest_swine_news/the-netherlands-seeks-to-ban-use-of-electric-prods-in-livestock_20490/.

[138] *AZA Board of Directors Policy Banning the Use of Bullhooks to Manage Elephants at AZA-Accredited Facilities*, Ass'n of Zoos & Aquariums (June 6, 2022), https://assets.speakcdn.com/assets/2332/aza_board_of_directors_policy_on_the_use_of_bullhooks_june_2022_final_draft.pdf.

[139] *See AZA to Phase Out Bullhooks for Elephant Management*, Am. Veterinary Med. Ass'n (Oct. 30, 2019), https://www.avma.org/javma-news/2019-11-15/aza-phase-out-bullhooks-elephant-management.

[140] *See, e.g.*, Elephants: Prohibited Treatment, S.B. 1062, Cal. State Assemb. (Cal. 2016) (enacted Aug. 29, 2016) (banning use of bullhooks).

[141] *See, e.g.*, S.B. 1062, *Progress for Captive Elephants! AZA Zoos Ditch Bullhooks*, People for the Ethical Treatment of Animals (Aug. 21, 2019), https://www.peta.org/blog/aza-bullhook-ban-progress-captive-elephants/ (explaining that PETA had long campaigned against use of the device).

III. Recommendations

To address the health, safety, welfare, and consumer protection issues posed by a lack of regulation in the dog training industry, this Note recommends that states implement professional licensing requirements for dog trainers, and that states, municipalities, or the FDA act to ban electric collars.

A. Professional Licensing Requirements for Dog Trainers

One of the most effective ways to remedy health, safety, welfare, and consumer protection issues in the dog training industry is to ensure that dog trainers can demonstrate an acceptable level of competence and are held to professional standards. Ideally, in implementing professional licensing requirements for dog trainers, states would use model legislation that had been drafted in coordination with multiple stakeholders, including veterinary and animal behaviorists, certified or credentialed dog trainers, and animal welfare organizations. Model legislation would help to ensure consistency across states, benefiting trainers and consumers alike.

Licensing requirements should be broad enough to encompass different paths to licensure, as multiple reputable dog training certification programs exist.[142] An approved dog training certification program should have minimum education requirements, require study of canine behavior science and learning theory, require adherence to a professional ethics code, and require continuing education to maintain certification. Model legislation should establish a dog trainer licensure board to oversee the licensing process, and to ensure, for example, that approved certification programs are indeed reputable.

The dog trainer licensure board should be established within the state's office responsible for professional licensure and should be comprised of multiple stakeholders. The majority of board members should hold a professional certification from an approved dog training or animal behavior program and be licensed themselves. At least one member of the board should be a board-certified veterinary behaviorist, a certified applied animal behaviorist, or a veterinarian who also holds a professional dog training license from an approved certification program specializing in canine behavior modification. There should

[142] *See, e.g.*, *Membership*, Vt. Pro. Dog Trainers Network, http://www.vtdogtrainers.com/membership.html (last visited Dec. 10, 2023) (recognizing professional certification from several certifying bodies, including the Certification Council for Professional Dog Trainers (CCPDT), the Karen Pryor Academy (KPA), International Association of Animal Behavior Consultants (IAABC), Pet Professional Accreditation Board (PPAB), and the Academy for Dog Trainers (CTC)).

also be at least one member of the board should be affiliated with a local nonprofit animal welfare organization. Moreover, at least one member of the board should be a current or former dog guardian who has no financial stake in the dog training industry. States should also consider adopting a registry of canine professionals to allow consumers to verify a trainer's license and good professional standing.

Licenses should be renewed periodically, such as every two years, and verification of continuing education requirements should be required for renewal. Any licensing fee should be reasonable and options for a waiver or reduction of fees should be available to remove financial barriers to licensure. Unprofessional conduct should be investigated, and disciplinary action should be taken where appropriate. Information pertaining to violations of professional conduct should be made publicly available, and civil fines should be available to deter unauthorized practice.

The Alliance for Professionalism in Dog Training has proposed comprehensive model legislation to assist states in enacting professional licensing requirements for dog trainers that meet many of these requirements.[143] The Alliance was formed by the Certification Council for Professional Dog Trainers (CCPDT) and the Association of Professional Dog Trainers (APDT) in response to the lack of regulation in the dog training industry.[144] While this model legislation is comprehensive, it exempts several dog training organizations from licensing requirements, including police, military, kennel clubs, and dog training programs for people who are incarcerated.[145] Alternatively, rather than imposing blanket exemptions, exemptions could be made on a case-by-case basis at the discretion of the licensure board. Ideally, all individuals who train dogs in a professional capacity would be held to professional licensing requirements.

The International Association of Animal Behavior Consultants (IAABC) supports regulating animal training industries:

> The absence of meaningful requirements in the field means that best practices need not be adhered to by those choosing to forego the necessary education and assessment of their own skills. The lack of such standards has been shown to increase the risk of relinquishment to

[143] *Model Legislation on Licensure of Dog Trainers*, All. for Professionalism in Dog Training (Jan. 11, 2023), https://prodogtraineralliance.org/wp-content/uploads/2023/03/Model-Licensure-Legislation-for-Professional-Dog-Trainers-1.11.2023.pdf.

[144] *About*, All. for Professionalism in Dog Training, https://prodogtrainer alliance.org/about/ (last visited July 3, 2024).

[145] *Model Legislation on Licensure of Dog Trainers*, *supra* note 143.

> shelters, the emergence or worsening of aggression and other serious behavioral issues in animals, and fails to protect trainers, the public, and the pets in their care.[146]

These licensing requirements would hold dog trainers to basic professional standards—similar to those seen in adjacent fields like veterinary medicine. For example, many states regulate veterinary technicians and require a passing score on a national standardized exam—the Veterinary Technician National Exam (VTNE) administered by the American Association of Veterinary State Boards—to be credentialed.[147] California, for example, requires that any person using the title "registered veterinary technician" or "veterinary technician" or otherwise representing themselves as a veterinary technician to have passed the VTNE.[148] Most jurisdictions require the completion of an accredited veterinary technology program to sit for the VTNE.[149] Alternatively, some states like Vermont offer a voluntary credential for veterinary technicians.[150] At least four states also allow for on-the-job training or alternate degree pathways to sit for the VTNE.[151] The models that states use to credential veterinary technicians could serve as useful models in establishing licensing requirements for dog trainers.

B. Banning Electric Collars

Professional licensing requirements alone would be insufficient to effectively remedy the welfare and consumer protection issues posed by electric collars, given the widespread retail sale of these devices and concerns that they may be marketed in deceptive, misleading, or fraudulent ways. The CVM should engage in regulatory action against these devices, as it has done in the past.

The CVM has the authority to regulate electric collars. Devices intended for animal use are not required to undergo pre-market approval

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[146] *IAABC Position Statement: Regulation in Animal Training and Behavior*, Int'l Ass'n of Animal Behav. Consultants, https://iaabc.org/regulation-in-animal-training-and-behavior (last visited July 4, 2024).

[147] *See Veterinary Technician Regulated & Non-Regulated Jurisdictions (States/Provinces)*, Am. Ass'n of Veterinary State Bds. (Jan. 1, 2023), https://www.aavsb.org/Download?url=s/a27p7w9eaycllgz/Veterinary%20Technician%20Regulated%20%26%20Non-Regulated%20Jurisdictions.pdf (listing the jurisdictions where the VTNE is required as part of the veterinary technician credentialing process).

[148] Cal. Bus. & Prof. Code §§ 4839-4841.4 (West 2023).

[149] *Verify Your Eligibility*, Am. Ass'n of Veterinary State Bds., https://www.aavsb.org/vtne-overview/verify-your-eligibility (last visited Apr. 20, 2025).

[150] *Veterinary Technician Regulated & Non-Regulated Jurisdictions*, *supra* at 147.

[151] *Verify Your Eligibility*, *supra* note 149.

by the FDA.[152] Under the Federal Food, Drug, and Cosmetic Act (FDCA), the CVM can engage in regulatory action against devices intended for animal use that are suspected of being adulterated or misbranded under §§ 501 and 502 of the FDCA, respectively.[153] Under § 201(h) of the FDCA, a "device" is defined as "an instrument, apparatus, [or] implement…*intended to affect the structure or any function of* the body of a man or other *animals*."[154] Electric collars qualify as a "device" under § 201(h) because they are designed to affect behavior—a "function of the body"—like barking or movement.[155]

The CVM also previously stated that it believes bark-activated electric collars qualify as a "device" under the FDCA.[156] As explained by the CVM, bark-activated electric collars "fall under the definition of a device since they are intended to affect barking, which is a natural dog function."[157] Electric collars used as part of electric fencing systems should also qualify as a device under the FDCA because they are designed to restrict movement, which is ordinarily understood to be a basic and fundamental function of the body. Likewise, remote-activated electric collars should qualify as a device under the FDCA because barking is one behavior or function of the body that remote-activated electric collars are used to modify. If, after investigation, the CVM believed intermediary measures were more appropriate, such as capping the intensity of stimulation emitted from these devices or requiring a prescription or permit for their use, then the CVM should engage in such action.

Alternatively, legislative or regulatory action could be taken against electric collars at state or local levels. While the Medical Device Amendments to the FDCA added an express preemption provision regarding device regulation, this provision is limited to devices intended for human use.[158] The provision generally "does not preempt a State

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[152] *Compliance Policy Guide § 655.100 Devices for Use in Animals*, U.S. Food & Drug Admin., https://www.fda.gov/regulatory-information/search-fda-guidance-documents/cpg-sec-655100-devices-use-animals (1987).

[153] *Id.*

[154] 21 U.S.C. § 321(h)(1) (1997) (emphasis added).

[155] *See id.*

[156] *Compliance Policy Guide Sec. 655.300 Barking Dog Collar*, *supra* note 90.

[157] *Id.*

[158] 21 U.S.C. § 360k(b) (1976) ("[N]o State or political subdivision of a State may establish or continue in effect with respect to a device intended for human use any requirement (1) which is different from, or in addition to, any requirement applicable under this chapter to the device, and (2) which relates to the safety or effectiveness of the device."). The FDA is exercising its authority under the FDCA to ban electric conditioning devices intended for human use. *See* Banned Devices; Proposal to Ban Electrical Stimulation Devices for Self-Injurious or Aggressive Behavior, 89 Fed. Reg. 20,882, 20,882 (Mar. 26, 2024) (to be codified at 21 C.F.R. pts. 882 & 895) ("[T]hese devices present an unreasonable and substantial risk of illness or injury that cannot be corrected or eliminated by labeling."); *see also* Banned Devices, 21 C.F.R. § 895.

or local requirement prohibiting the manufacture of adulterated or misbranded devices," unless "the requirement is different from, or in addition to, a Federal requirement established under the [FDCA]."[159] With respect to electric collars, unless the FDA has spoken to the issue, states and municipalities do not appear to be preempted from banning the devices. Even if the FDA does speak to the issue, the FDCA only expressly preempts regulations pertaining to devices intended for human use.[160] However, state statutes that restrict the regulation of "electronic locating collars" may preempt state or local bans.[161] In any case, legislative or regulatory efforts should address the range of electric collars, including remote-activated collars, bark-activated collars, and wireless fencing systems. In sum, states should adopt professional licensing requirements for dog trainers using comprehensive model legislation, and regulators and legislators should act to prohibit electric collars.

Conclusion

A lack of regulation in the dog training industry has resulted in the abuse, disappearance, and death of dogs. It has also enabled the proliferation of aversive devices and practices like the use of electric shock collars. The consensus among professional veterinary and animal behavior associations is that aversive training poses considerable risks of harm to dogs and humans. Several countries have banned aversive devices in dog training, and welfare-driven device bans are frequently seen in other nonhuman animal industries like the rodeo industry.

This Note offers two recommendations to address these issues: First, this Note encourages states to adopt professional licensing requirements for dog trainers using comprehensive model legislation. Second, this Note encourages states, municipalities, or the FDA, through the CVM, to ban electric shock collars. The CVM has taken regulatory action against electric collars in the past because of health and safety concerns, yet these devices remain on the market and may continue to pose unacceptable risks of harm in the absence of meaningful regulation. These recommendations offer constructive solutions to address substantial health, safety, and consumer protection issues—while most importantly, safeguarding and advancing the welfare of dogs.

[159] 21 C.F.R. § 808.1(d)(6)(ii) (1978).

[160] 21 U.S.C. § 360k(b).

[161] *See* Tenn. Code Ann. § 44-17-401 (2012); *see also* Idaho Code § 25-2807 (1991).

Green Deaths: Equal Parts Death and Nature

Kathryn Rejaei*

"There is no such thing as death. In nature nothing dies."
~Charles Mackay

"The only thing humans are equal in is death." ~Johan Liebert

Introduction

When choosing a method of final disposition, individuals typically do not consider the effect their death will have on the very ground they plan to lie within. In 2017, of the 2.8 million deaths reported, 52% of people chose cremation while approximately 42% chose to be buried.[1] Of these two popular funerary practices, which comprise 95% of death decisions, a traditional "burial has the largest environmental impact in terms of land use, respiratory organics, and respiratory inorganics."[2] Annually, the funeral industry buries "(1) over 800,000 gallons of formaldehyde, (2) 2.3 billion tons of concrete, (3) 115 million tons of steel, and (4) enough wood to build 4.6 million single-family homes."[3] Not only does burying formaldehyde and using chemicals needed to maintain the grass landscape have toxic effects on the land, but such an excessive expenditure of resources, including the water necessary to maintain such swaths of grassland, has both local and global ramifications.[4] To manufacture approximately two million caskets per year "requires hundreds and thousands of tons of bronze,

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[1] Helen Mitsuko Marsh, *The Green New Death: A Legislative Framework to Promote and Legalize Green Funerary Alternatives*, 12 Geo. Wash. J. Energy & Envt. L. 124, 124-25 (2021).

[2] *Id.* at 126.

[3] *Id.*

[4] Christopher Coutts et al., *Natural Burial as a Land Conservation Tool in the US*, 178 Landscape & Urb. Plan. 130, 131 (2018).

copper, and steel, and millions of board-feet of wood."[5] As one of the countries with the highest burial rates, the United States is one, if not the only, country whose laws presume all gravesites are held in perpetuity unless specified by state statute.[6]

As the number of human remains increases and as natural resource availability decreases, there is an opportunity to address these concerns with a ban on traditional burials in the United States. Such practices can be replaced with more sustainable alternatives, including some that not only stop the progression of environmental harm caused by traditional burials and cemeteries, but also work to replenish the natural resources that traditional funeral practices siphoned the life out of centuries prior.

Recognizing that there are obstacles in implementing a ban on traditional burials, such as administrative issues and government oversight, this Article focuses on the reasons a ban is necessary, as well as provide alternative options to address the argument that an outright ban is an extreme measure. Due to the detrimental and lasting effects cemeteries cause, a solution to this issue is not only necessary but must also be plausible and palatable by the public to be effective. The current system of state-governed death practices also affects consumers in non-public, health-related ways, such as depriving and deceiving individuals of their burial options. Death is often a personal and sometimes spiritual event, and autonomy in decisions is an equally crucial part of a proper solution. However, with the current property scheme, imposing a ban on traditional burials would require traditional cemeteries to discontinue burials, rather than waiting for all active cemeteries to reach capacity or be abandoned to then begin the long restoration process.

I. The Problem: Traditional Methods

A. Cemeteries

As of 2016, only 15% of cemeteries in the United States are active, which means that the other 85% are either at capacity or abandoned.[7] Even if U.S. laws permit abandoned cemeteries to be transformed into

[5] Katie M. Alfus, *Better Homes and Scattered Gardens: Why Iowa Should Legalize "Human Composting" as a Method of Final Disposition*, 106 Iowa L. Rev. 325, 347 (2020).

[6] *See* Tanya D. Marsh, *When Dirt and Death Collide: Legal and Property Interests in Burial Places*, 30 Prob. & Prop. 59, 62 (2016); *cf.* Julie Rugg, *Defining the Place of Burial: What Makes a Cemetery a Cemetery*?, 5(3) Mortality 259, 262 (2000) ("[I]n Britain after the Reformation and in the USA, the overt reuse of graves did not become part of the burial culture: burial rights granted in perpetuity guaranteed that graves would never be disturbed and the remains would stay intact.").

[7] Coutts et al., *supra* note 4, at 131.

urban parks or green spaces, current burial practices can cause the land to be unsalvageable for other uses in the future.[8] Studies show that "[t]he source of pollution ranges from the corpse to coffins and accessories."[9]

1. Environmental Risk: Contamination

Coffins are typically constructed from wood or metal, but both materials pose risks of contamination due to direct exposure to the soil and water, causing the materials to corrode and seep into the surrounding soil and groundwater.[10] Wood coffins are either treated with products containing toxic chemicals or heavy metals because "untreated wood decomposes quickly, allowing for rapid leaching of the contents," like embalming chemicals.[11] Today, no state laws require caskets to be placed in a vault or grave box.[12] Moreover, these containers, although made of "concrete, metal, or fiberglass which is sealed," are "not designed to be impervious to water seepage" and only serve to prevent the land above the grave from sinking.[13] As a result, the decomposing casket and the contents within it release volatile organic matter into the soil, which then escapes from rainwater, passing through the soil particles and contaminating the groundwater, soil, and, at times, even the air.[14]

Specifically, the soil and the groundwater are contaminated "by several ions (organic and metallic) and microorganisms (bacteria and viruses)" at levels comparable to landfills.[15] The contaminates are picked up by "rain, snow, dew, and natural moisture which percolate[]

[8] *See* Alfus, *supra* note 5, at 347; *see also id.*

[9] Dison SP. Franco et al., *The Environmental Pollution Caused by Cemeteries and Cremations: A Review*, 307 Chemosphere 1, 5 (2022).

[10] Alison L. Spongberg & Paul M. Becks, *Inorganic Soil Contamination from Cemetery Leachate*, 117 Water, Air, & Pollution 313, 314 (2000).

[11] *Id.*

[12] *See* FTC Funeral Industry Practices, 16 C.F.R. § 453.3 (1994).

[13] Spongberg, *supra* note 10.

[14] *See* Massas et al., *Is the Ground of an Old Cemetery Suitable for the Establishment of an Urban Park? A Critical Assessment Based on Soil and Microbiological Data*, 18 J. of Soils & Sediments 94, 95 (2017); *see also* Ahmet S. Üçisik & Philip Rushbrook, *The Impact of Cemeteries on the Environment and Public Health*, World Health Org. Reg'l Off. Eur. 1, 8 (1998) ("The part of the soil between coffin and the ground surface is usually less compact. It allows some air to enter. Human corpses aerobically decompose quickly when aeration is provided. However, rainfall can also more easily enter the soil by this route and provide a means for microorganisms within the corpse to escape."); *see also*, Franco et al., *supra* note 9, at 2 ("Reports show that cemetery pollution produces an alteration in microbiological components and increases the prevalence of heavy metal and toxic organic pollutants (TOCs) in the soil and subterranean water, being even discovered in the air.").

[15] Franco et al., *supra* note 9, at 2, 5.

through the waste."[16] The then-contaminated wastewater is referred to as leachate.[17] Decomposing organic matter also produces leachate; more specifically, the leachate produced from decomposing remains is often referred to as necroleachates or necro slurry, which not only contaminates the soil and groundwater in its direct surroundings, but can also be picked up by precipitation, increasing its spread.[18] Necroleachates contains nitrates that generate cadaverine and putrescine, compounds which "are carcinogenic to several animal species and may pose…risk[s] to human health."[19] Heavy metals, including arsenic, copper, iron, lead, and zinc, have been found in the soil taken from cemeteries in the United States and the land surrounding those cemeteries.[20] Concerningly, high levels of these heavy metals in the bloodstream can cause serious health risks.[21]

2. Lasting Effects of Contamination

Completely reversing the devastating contamination on the cemetery soil and the soil surrounding the grounds is nearly impossible.[22] Even to achieve a level that is considered "close to stable" an extensive amount of time and human intervention to implement the proper mechanisms are both required.[23] Studies found that even for a cemetery that only operated for a few years, it required eleven years and "good aeration, sufficient drainage, and relatively high temperatures" for the soil's ecosystem to return to a near-stable state.[24] Given that a majority of national cemeteries are well over 100 years old,[25] most cemeteries

[16] Allison N. Zsamba, *Shaimos Burials: Why Religion Should Yield to the State's Compelling Interest in Environmental Regulation and the Protection of Human Health*, 14 Rutgers J. of L. & Religion 187, 210 (2012).

[17] *Id.*

[18] *Id.*

[19] *Id.* at 4.

[20] *Id.*

[21] *Id.* at 2 (stating that copper can cause harm to the neurological system, zinc causes liver disease, iron can cause liver cirrhosis and corrosion in the gastrointestinal tract, lead is a neurotoxin and can cause disruptions to the central nervous system, and chromium can cause lung cancer); *see also* Marisa F. Naujokas et al., *The Broad Scope of Health Effects from Chronic Arsenic Exposure: Update on a Worldwide Public Health Problem*, 121 Envt'l Health Persps. 295, 295 (2013) (Arsenic is a carcinogen known to cause skin, lung, bladder, kidney, and liver cancer as well as dermatological, developmental, neurological, respiratory, cardiovascular, immunological, and endocrine effects.).

[22] Massas et al., *supra* note 14, at 107.

[23] *Id.*

[24] *Id.*

[25] *See generally Dates of Establishment: National Cemeteries & NCA Burial Sites*, U.S. Dep't of Veteran Affs. (Nov. 2, 2023), https://www.cem.va.gov/facts/Dates_of_Establishment_1.asp.

would require even more time and extensive restoration efforts than cemeteries that only operated for a few years. Similarly, the Fresh Kills Landfill, which first opened in 1948 and closed fifty-three years later in 2001, began its restoration process to be reclaimed into a park in 2008,[26] but is not expected to be complete until 2036.[27]

Another example of the lasting effects of water contamination is the continued presence of arsenic in water sources near old cemeteries. Arsenic effortlessly dissolves in water, easily polluting entire bodies of water, and in turn,[28] contaminating local water sources. Arsenic-based embalming fluids were heavily used during the Civil War until they were banned in 1910 after embalmers suffered serious and fatal health concerns.[29] Over 100 years since the ban, a U.S. Geological Survey conducted by the U.S. Department of the Interior in 2017 found arsenic levels well above the federal limit in water sources near a cemetery in Lansing, Michigan.[30] Despite the ban on arsenic-based embalming fluids, arsenic-treated wood is still used to manufacture coffins and caskets.[31]

3. Bio-Un-Diverse

In addition to the adverse health effects contaminants have on humans and animals, they also harm land and soil biodiversity.[32]

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[26] *See Landfill to Park Timeline*, The Freshkills Park All., https://freshkillspark.org/the-park/chronology-of-the-freshkills-park-site (last visited Mar. 17, 2023).

[27] *See FAQS, When Will the Park Open?*, The Freshkills Park All., https://freshkillspark.org/the-park/faqs (last visited Mar. 17, 2023).

[28] *See* Jin-Young Chung et al., *Environmental Source of Arsenic Exposure*, 47 J. Preventative Med. Pub. Health 253, 253 (2014) ("Many common arsenic compounds can dissolve in water, thus arsenic can contaminate lakes, rivers, or underground water by dissolving in rain, snow, or through discarded industrial wastes. Therefore, arsenic contamination in ground water is a serious public health threat worldwide"); *see also* Elsa M. B. Sorensen, Metal Poisoning in Fish 82 (CRC Press, 1991) ("Arsenic is one of the most toxic elements to fish.").

[29] John L. Konefes & Michael K. McGee, *Old Cemeteries, Arsenic, and Health Safety*, Dangerous Places: Health, Safety, & Archaeology, Oct. 2000, at 127, 131.

[30] Angela K. Brennan et al., *Preliminary Investigation of Groundwater Quality Near a Michigan Cemetery, 2016-17*, U.S. Geological Surv. Investigations Rep. 1, 1 (2018) ("[S]everal trace metals, including arsenic, manganese, and aluminum, were present in high concentrations, with arsenic concentrations typically exceeding the U.S. Environmental Protection Agency (EPA) drinking-water standard."); *see also* Mollie Bloudoff-Indelicato, *Arsenic and Old Graves: Civil War-Era Cemeteries May Be Leaking Toxins*, Smithsonian Mag. (Oct. 30, 2015), https://www.smithsonianmag.com/science-nature/arsenic-and-old-graves-civil-war-era-cemeteries-may-be-leaking-toxins-180957115/ ("[I]n 2002, a USGS-sponsored survey in Iowa City found arsenic levels at three times the federal limit near an old cemetery.").

[31] Spongberg, *supra* note 10, at 326.

[32] Franco et al., *supra* note 15, at 2.

Decomposing organic matter create above average "quantities of ammonia, nitrate, nitrite, and pH" in the soil which "can lead to the proliferation of pathogenic microorganisms" and cause "irreversible and unfortunately irreparable" impacts on the ecosystem, food chain, and natural resources.[33]

Both contamination and lack of biodiversity make it difficult for abandoned cemeteries to be reclaimed into parks or green spaces that are safe for humans and animals to use and for vegetation to flourish without the proper ecosystem in place. Additionally, such restoration requires considerable time, ideal conditions, and, most importantly, modern technology and human interference.[34] Although soil conditions can eventually be restored, first and foremost, the land must not actively be in use to avoid further contamination and allow for the microclimate to be restored.[35]

4. Planting a Tree as a Band-Aid

Funeral directors who oppose greener alternatives are ignorant of the realities of environmental risks, as "it has been shown that trees intercept a portion of the rainfall,"[36] which may help intercept some of the contaminated percolations; however, simply reforesting active cemeteries with trees and other vegetation is not sufficient to mitigate the contamination issues caused by high levels of pollutants.[37] It is true that with "proper management techniques, the abandoned cemeter[ies] can be converted to…recreational park[s]," which, in turn, could alleviate some of the land waste issues regarding existing cemeteries.[38] However, it should not become the standard practice to justify the continued use of cemeteries for traditional burials in reliance that, in decades, it *may* become a park. By doing so, cemeteries would continue to waste resources and contaminate the surrounding land and groundwater until they reach capacity or are abandoned, only to eventually use more resources to transform them into greener spaces.

5. Cemetery Water Usage

Although there is insufficient research on U.S. cemeteries' water usage due to differences in climate across the country, irrigation systems, and on-site wells, some estimates and comparisons can be made

[33] *Id.* at 4.
[34] *See* Massas, *supra* note 14, at 107.
[35] *See id.*
[36] Üçisik, *supra* note 14, at 4.
[37] Franco et al., *supra* note 9, at 3.
[38] Massas, *supra* note 14, at 107.

based on water needed to maintain grass. "[C]emeteries are basically golf courses for the dead," a comparable swath of land covered in meticulously maintained and manicured grass.[39] Annually, golf courses can use anywhere from one acre-foot of water per acre to six acre-feet per acre of water in hot, dry climates.[40] One acre-foot of water is the amount needed to cover one acre of land, which is equivalent to 325,851 gallons.[41] From 2003 to 2005, the average annual water usage by golf courses across the country was about two acre-feet of water per acre.[42] Altogether, "all cemeteries in the United States occupy an estimated 1 million acres of land."[43] If the average golf course water usage of two acre-feet of water is applied to the one million acres of cemetery land in the United States, it can be estimated that cemeteries use about 652 billion gallons of water annually. According to the Environmental Protection Agency (EPA), the average American family uses 109,500 gallons of water per year.[44] This means that cemeteries in the United States use the same amount of water as almost six million American households annually.

When facing issues of land shortage, climate change, loss of natural resources, drought, and other issues that affect populations locally, nationally, and globally, a question is raised as to why we dedicate so much land that only perpetuates these issues when not only the land, but also death itself can benefit the environment and replenish the resources it has been depleting for centuries.

B. The Problem with Cremation

To individuals unaware of funeral practices' adverse environmental effects, the logical solution to avoiding traditional burials is cremation. Many assume that cremated remains are not buried, and although many families keep remains in urns inside their homes or spread remains in nature, burying urns remains a common practice.

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[39] Victoria J. Haneman, *Tax Incentives for Green Burial*, 21 Nev. L.J. 491, 525 (2021).

[40] *How Much Water Golf Courses Need*, U.S. Golf Ass'n (Apr. 11, 2016), https://www.usga.org/course-care/water-resource-center/how-much-water-golf-courses-need.html. ("One acre-foot equals about 326,000 gallons, or enough water to cover an acre of land, about the size of a football field, one foot deep.").

[41] *Id.*

[42] Gregory T. Lyman, *How Much Water Does Golf Use and Where does it Come From?*, U.S. Golf Ass'n 1, 2 (2012), https://www.usga.org/content/dam/usga/pdf/Water%20Resource%20Center/how-much-water-does-golf-use.pdf.

[43] Marsh, *supra* note 1, at 126.

[44] *How We Use Water*, EPA, https://www.epa.gov/watersense/how-we-use-water (Sept. 12, 2024).

1. Contamination

Cremation itself and the practices following the cremation can also contaminate soil and groundwater.[45] Spreading ashes on a landscape or into a body of water releases heavy metals.[46] Although burying urns protects the soil and groundwater from the ashes for some time, urns will eventually degrade, releasing toxins from the urns' materials and from the ashes inside.[47]

2. Resource Expenditure

Moreover, the incineration necessary for cremation causes the most damage through its use of natural resources, and the effects of pollution on the environment and ecosystem. Incineration requires a "substantial quantity of fossil fuel,"[48] since most crematories use natural gas to fuel incinerators.[49] One cremation uses the equivalent of twenty gallons of gasoline in natural gas, which is more than a vehicle's average gas tank capacity.[50] In addition, cremation also requires cremation containers that are usually made from a combination of plastic, cardboard, plywood, willow, bamboo, or varnished wood.[51] All whilst the incineration and burning fossil fuels pollute the air with excess carbon dioxide.

3. Mercury Pollution

Another byproduct of incineration is mercury fumes, which are a result of mercury amalgam dental fillings being incinerated, which then release mercury pollution.[52] Normally, mercury levels from cremation practices are relatively low, but as cremation has become a more popular choice, the emission levels have become significant enough to elicit governmental consideration.[53] Mercury is known to have toxic effects, and exposure can be harmful to animals and fish,

[45] *See* Franco et al., *supra* note 9, at 2, 5.

[46] *Id.* at 5.

[47] *Id.*

[48] Haneman, *supra* note 39, at 492.

[49] Barbara Kemmis, *Environmental Impact of Cremation*, Cremation Ass'n of N. Am.: The Cremation Logs (Oct. 21, 2022), https://www.cremationassociation.org/blogpost/776820/357871/Environmental-Impact-of-Cremation.

[50] *Id.*

[51] *Id.*

[52] Philip Donald Batchelder, *Dust in the Wind? The Bell Tolls for Crematory Mercury*, 2 Golden Gate U. Env't. L.J. 118, 124 (2008).

[53] *Id.* at 119.

especially animals whose main food source is fish.[54] Side effects of mercury exposure in animals can result in "mortality, reduced fertility, slower growth, and abnormal behavior that adversely affects survival," which can have serious consequences on an entire species.[55] In the U.S., the EPA has set forth regulations for mercury pollution from other industries by requiring the use of filters and proper disposal.[56] Despite the EPA identifying cremation as a source of mercury pollution, it has excluded the funeral industry from said regulations, and states are resistant to adopting such requirements due to the cost and the lack of EPA standardization.[57] Cremations are still an environmental issue even if mercury fillings were removed prior to incineration because they still "emit an array of pollutants and toxins" and waste a variety of natural resources.[58]

II. Solutions

When faced with death, the funeral industry leads individuals down "one of two normative paths—casket or cremation,"[59] both of which are not "economically or environmentally sustainable."[60] While more sustainable methods are emerging and suggested, the time needed to effectuate change in law, politics, thought, and practice, to not only stop the damage being done and potentially reverse some of it, is time the environment may not have left to give.

A. Failed Tax Incentives

Government programs, such as the use of tax incentives to encourage individuals to choose more sustainable funeral services, are unlikely to produce the magnitude of change needed. Research shows that environmental concerns regarding taxes and government spending tend to politicize concerns and deviate from properly solving the problem. Further, tax incentives are not used at the rate necessary to create change. For example, the Alternative Motor Vehicle Credit (AMVC) was introduced in 2006 as a credit for purchases of qualified hybrid vehicles.[61] Although more hybrid cars were purchased, the

[54] *Id.* at 121.
[55] *Id.*
[56] *Id.* at 123.
[57] *Id.* at 123, 144.
[58] *Id.* at 160.
[59] Haneman, *supra* note 39, at 492.
[60] *Id.* at 524.
[61] Severin Borenstein & Lucas W. Davis, *The Distributional Effects of U.S. Clean Energy Tax Credits*, 30 Tax Pol'y & Econ. 191, 197 (2016).

increase was not caused by the AMVC, as IRS research suggests that "only approximately one in eight hybrid buyers actually received the credit."[62] If the same statistic were applied to the 2.8 million people who died in the United States in 2017, only 350,000 people would choose the tax incentive for a "green death." While tax incentives may nudge a small portion of the population when making decisions about their next vehicle, it would be difficult to predict if individuals would have the same or better attitudes when making decisions about their afterlife, especially when religious perspectives are involved. Tax incentives also fail because they could be seen as "encouraging some families to abandon their religious traditions in lieu of a tradeable commodity."[63]

B. Better Solutions

Although not widely advertised by the funeral industry, there are many alternatives that are more sustainable than traditional burials and cremations; and some of which even help to improve the ecosystem.

1. Green Burials

Green death, green burials, or natural burials (NB) "broadly encompass[] any process that reintegrates human remains into the planet in an environmentally friendly way."[64] Green burials "focus[] on the natural decomposition of the corpse, meaning that the corpse is not previously prepared with chemical preservatives or embalming fluid. Due to the lack of chemicals, the natural degradation of the body takes action and the production of the necro-slurry is prevented."[65] A green burial can encompass many processes, but to qualify as "green" it must not use toxic chemicals to preserve the remains upon burial or maintain the landscape, any container used must be biodegradable, and the practice focuses on restoration or preservation of natural habitats.[66]

These burials can take place in any of the three types of burial grounds: "hybrid cemeteries (offering both conventional and green burial options), natural burial grounds (committed to sustainable, organic practices), or conservation burial grounds (to ensure perpetual protection of the land through a deed restriction or conservation

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[62] *Id.* at 201-02.

[63] Adrianna K. Michalska, *REC-overing Body Heat: How Awarding Renewable Energy Credits to Crematoria Can Encourage the Development of Renewable Electricity*, 50 Conn. L. Rev. 987, 1014 (2018) ("Death practices vary and are deeply embedded within the cultural and religious traditions of different people.").

[64] Haneman, *supra* note 39, at 506.

[65] Franco et al., *supra* note 9, at 8.

[66] Haneman, *supra* note 39, at 507-08.

easement)."[67] All three types of green burial grounds "provid[e] spatially far-reaching benefits by greatly reducing or completely eliminating much of the resources used to manufacture burial products."[68] There are cases of natural burial grounds that actually restored the natural habitat.[69] Natural burial methods as tools of restoration are not restricted to cemetery grounds. These same methods are applied to agricultural land "to restore the natural habitat that existed prior to the conversion of land to agricultural use."[70]

> There are at least six reasons why NB cemeteries are well positioned to continue to expand in the [United States] in the coming decades as a more environmentally sustainable alternative to traditional cemeteries: 1) NB foregoes excessive resource consumption; 2) There are currently few legal barriers to NB; 3) Certified natural burial and conservation burial grounds are protected in perpetuity by deed restrictions and conservation easements, and all NB grounds are protected culturally by the sacredness that burial imparts to land; 4) NB is less expensive than traditional burial; 5) NB cemeteries are scalable, and there is no shortage of land in need of conservation/restoration that can be converted to burial if demand continues to increase; [and] 6)…[L]arger natural burial grounds and conservation burial grounds can be multifunctional spaces. This multifunctionality can create social benefits (e.g., recreation) and extend the support base for NB grounds to include those with interests beyond natural habitat conservation.[71]

2. Green "Cremation"

Alkaline hydrolysis, which is also known as bio-cremation, occurs when "human tissue is liquefied, leaving behind…any other insoluble objects that were in the body at the time the person passed

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[67] *Id.* at 507; s*ee also FAQ*, Prairie Creek Pres. Cemetery, https://www.prairiecreekconservationcemetery.org/faq-pccc (last visited March 18, 2023) (Conservation burial is defined as "go[ing] one step further to conserve land. A portion of each burial fee is committed to pay for land acquisition, protection, restoration, and management. The burial area also becomes hallowed ground, restored to its natural condition and protected forever with a conservation easement. Native plants beautify the burial sites.").

[68] Coutts et al, *supra* note 4, at 134.

[69] *Id.*

[70] *Id.*

[71] *Id.* at 136.

away."[72] Thus, resolving concerns of mercury pollution as the mercury fillings would be left behind, and burning nonrenewable fossil fuels is unnecessary because it is a chemical process. The liquified tissue "is sterile, contains no DNA, and can be discharged to the sewer system or a green space without further treatment."[73] Other benefits to this process include avoiding the use of embalming fluids, emitting only a quarter of the carbon dioxide that fire cremations emit, and saving prosthetics from incineration to be reused or recycled.[74] Although the use of alkaline hydrolysis first began in 1888, due to its unfamiliarity, it is currently only legal in eighteen states and is unregulated by the EPA.[75]

3. Human Composting

Human composting, also known as "recomposting," is another alternative to traditional funerary options, and is the process of turning human remains into roughly two wheelbarrows full of highly fertilized soil.[76] As of April 2021, this service has only been legalized in one state, Washington, but is under consideration in Colorado and Delaware.[77] Human composting is estimated to save between .84 and 1.4 metric tons of Carbon Dioxide."[78] When properly facilitated, it "produces no foul odors, does not attract vermin, will not pollute the water supply, and kills pathogens."[79] Recomposting is regulated in a similar manner to the disposal of livestock remains in Washington, which has even met the same sanitary and safety standards used for topsoil, per Washington's

[72] Marsh, *supra* note 1, at 128; *see generally* Alfus, *supra* note 5, at 343 (Other reference names for Alkaline hydrolysis include "liquid cremation" or "water reduction.").

[73] Shiloh R. Krupar, *Green Death: Sustainability and the Administration of the Dead*, 25 Cultural Geographies 267, 272 (2018).

[74] *Id.* at 129.

[75] Haneman, *supra* note 39, at 506; Marsh, *supra* note 1, at 129.

[76] Marsh, *supra* note 1, at 129; *see also* Alfus, *supra* note 5, at 342-43 (Describing the difference between alkaline hydrolysis and human composting "'[a] lkaline hydrolysis is a chemical process that uses a combination of hot water, lye, pressure, and circulation to liquefy a corpse in a few short hours. The process dissolves flesh to its liquid elements.…Studies show the resulting liquid to be a sterile effluent, which can be safely discharged into a city sewer or possibly used as fertilizer.… Proponents of alkaline hydrolysis claim the process is a dignified, respectful, and green alternative to cremation because the process merely accelerates the natural process of decomposition.' Thus, the end rest of alkaline hydrolysis is not soil, but a liquid.").

[77] Marsh, *supra* note 1, at 129.

[78] *See* Marsh, *supra* note 1, at 130; Alfus, *supra* note 5, at 348 ("Recomposition also requires about one-eighth the amount of energy that is needed for cremation. The recomposition process sequesters air pollutants, saving an estimated metric ton of carbon dioxide." (footnote omitted)).

[79] Haneman, *supra* note 33, at 508.

Department of Ecology.[80] The soil can then be taken home by the family members of the deceased or donated to a conservation forest.[81] Legalizing recomposition has many positive results. First, "[a]s a natural part of the ecosystem, corpses can generate biovalue through composting processes that benefit nature and living humans."[82] Second, the soil remains will become one with the land in the most natural form, and lastly, recomposition "can combat land scarcity and promote efficient land use," removing the need for dedicated land, because "where [the] composted remains lay, there is room for other life to grow."[83]

4. Memorabilia

When people began considering cremation as a more sustainable alternative to burials, many new memorial methods developed. The crux of each service is mixing the ashes from a cremation with a medium, creating art, jewelry, stones, paintings, and ceramics as remembrance pieces.[84] Even "eco-aware cremation options" are available. For example, cremation remains can be turned into a "reef ball" that is placed in the ocean to reverse the depletion of coral reefs.[85] An option is a memorial tree, which uses a bio-urn that does not harm vegetation, unlike ashes due to their high pH level.[86] However, the dilemma with "ash-memorial" methods is that cremation is still necessary. Although cremation is a greener alternative to traditional burials, it still wastes an excessive quantity of resources and "generates carbon dioxide and numerous noxious gases and carcinogens," along with mercury pollution.[87]

5. Two Greens Make a Right

There is little discussion on the possibility of combining the bio-cremation method with alkaline hydrolysis, which creates an ash-like powder from human remains in remembrance pieces. Bio-cremation removes the harmful part of what would otherwise be a green solution to avoid traditional burials and their effects on the environment and natural resources. This way, the remains of people's loved ones can be turned into ceramic pieces, glass artwork, paintings, tattoos, vinyl records, jewelry, diamonds, and more, without the guilt of fire-

[80] Alfus, *supra* note 5, at 342-43.
[81] *Id.* at 343.
[82] Krupar, *supra* note 73, at 274.
[83] Alfus, *supra* note 5, at 347.
[84] *See* Haneman, *supra* note 39, at 498-500.
[85] *Id.* at 502.
[86] *Id.* at 502-03.
[87] Krupar, *supra* note 73, at 270.

fueled cremations. Moreover, bio-cremation and other green methods mentioned previously, coupled with eco-aware memorial methods like planting trees, "reef balls," and fertilizing specific trees in forests that are dedicated to conservation.[88] In doing so, these eco-aware methods coupled with green decomposition or disposal methods not only stymie further harm to the environment, but actually work to restore it.

6. More on Coral Reefs

Reef balls are an emerging method of final disposition, where human remains are transformed into coral reef balls. Essentially, a perforated dome is created by combining the remaining ash with concrete, and the final product helps coral reefs and other underwater plants grow by providing a habitat for ocean life.[89] A reef ball's coordinates serve as the "grave" location, and the practice as a whole serves as a "way to give back after life by replenishing the dwindling natural reef systems" because the reef balls "help restore marine habitats by mimicking some characteristics of a coral reef."[90] Eternal Reef, a non-profit charity founded in 1980, seeks to protect the world's reef system by creating reef balls.[91] Neptune Memorial Reef is amongst the world's largest human-made reefs, and is "is home to [fifty-six] species of fish, as well as crabs, sea urchins, sponges and coral. When Neptune Memorial Reef is complete, it will comprise 250,000 memorials."[92]

7. Remains as Renewable Energy

New research suggests that biomass could serve as a source of renewable energy by burning human corpses to produce electricity.[93]

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[88] Haneman, *supra* note 39, at 503 ("Better Place Forests is a San Francisco-based start-up that has raised $12 million in venture capital funding in an effort to 'redesign the entire end-of-life experience.' The company is buying forests in California, obtaining conservation easements to prevent development of the land, and selling the ability to feed cremated remains mixed with fertilizer to a specific tree.").

[89] *See, e.g.*, Abby Young-Powell, *Reef Ball Burials: The New Trend for Becoming 'Coral' When You Die*, The Guardian (Feb. 21, 2022), https://www.theguardian.com/environment/2022/feb/21/reef-ball-burials-the-new-trend-for-becoming-coral-when-you-die.

[90] *See id.*

[91] *The Eternal Reefs Story*, Eternal Reefs, https://www.eternalreefs.com/the-eternal-reefs-story/#:~:text=Eternal%20Reefs%20began%20simply.%20In%20the%20late%201980s (last visited Dec. 3, 2024) (stating that Eternal Reefs began in the late 1980s); *Eternal Reefs Fast Facts,* Eternal Reefs, https://www.eternalreefs.com/documents/Eternal-Reefs-Fast-Facts.pdf (last visited Nov. 22, 2023) ("Eternal Reefs…is the world's largest, most successful provider of designed memorial reef.").

[92] Young, *supra* note 83.

[93] *See generally* Michalska, *supra* note 63.

Other states, such as California, Connecticut, and Oregon, have begun implementing this method and have recovered energy from organic matter.[94] The most basic form of converting non-corpse biomass into renewable energy—direct combustion—has existed for centuries.[95] More complex conversions can produce many types of renewable fuel, however, the application of these methods to a corpse is a novel concept and is in the early stages of discussion.[96] The Afterlife Project explores the concept of collecting a corpse's electrical energy.[97] The Afterlife Project's research proposes that by gathering a corpse's biomass into microbial fuel cells, the energy can be placed into a battery.[98]

Of course, these are not practices that every person would choose, as some wish to have their ashes spread in nature or buried, and others may choose safer options in how their cremated remains are handled. Green deaths "will not solve the problem of climate change, but it does respect the notion that one's last act on earth should not be to harm it."[99] Incorporating environmentally friendly habits during one's life can be difficult to adopt, due to the cost and the sheer inconvenience. However, "choosing a green funerary alternative to dispose of one's body after death is the easiest way to reduce one's environmental impact because the decedent will not be around to suffer the inconvenience of it."[100]

C. Public Policy Perspectives

Death and after-life beliefs can be both extremely personal for individuals and deeply rooted in a person's culture and religion.[101] Not only does this affect the public's attitude towards choosing a sustainable death practice in the future, but it also implicates the more difficult task of dealing with the cemeteries that already exist and the remains of those already buried.[102]

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[94] *Id.* at 1007-08.

[95] *See Biomass–Renewable Energy from Plants and Animals, Biomass Explained*, U.S. Energy Info. Admin., https://www.eia.gov/energyexplained/biomass/ (July 30, 2024).

[96] *Id.*

[97] Jimmy Loizeau & James Auger, *Afterlife Project*, Goldsmiths U. London (2008), https://research.gold.ac.uk/id/eprint/5643/.

[98] *Id.*

[99] Haneman, *supra* note 39, at 493 ("Green deaths referring to any sustainable death practices such as green burials, green cremation, human composting, memorabilia, and renewable energy.").

[100] Marsh, *supra* note 1, at 135.

[101] Michalska, *supra* note 63, at 1014 ("Death practices vary and are deeply embedded within the cultural and religious traditions of different people.").

[102] *See* Alfus, *supra* note 5, at 334.

Public awareness is crucial for consumer welfare as normally, "the funeral transaction is…influenced by…the disorientation caused by bereavement, the lack of standards by which to judge the value of the commodity offered by the seller, the need to make an on-the-spot decision, [and] general ignorance of the law."[103] The stigma associated with non-traditional death care comes from a lack of understanding. When the practice of cremation began, there was much resistance to the idea, but discussion and education on the practice shifted public perception, which is evidenced by the percentage of cremations increasing from 3% in 1960 to approximately 50% today.[104]

1. Religious Affiliation Approval

It is possible to find flexibility in many religious teachings and beliefs that are compatible with green death practices. Religion is often raised to counter green death efforts based upon the stereotypical notion that such practices "attract[] the eco-chic, environmentally conscious, well-educated, unchurched consumer."[105] Although the Vatican has not commented on the acceptability of bio-cremation, local bishops have denounced it.[106] In 2016, however, the Vatican did approve green burials as an appropriate and "authentic Christian practice."[107] As of 2017, 12% of green burial cemeteries were Catholic, and churches are in support of reusing graves.[108]

In other religions and cultures, green burial practices do not stray far from their norms. In traditional Jewish practices, "burial[s] involve[] family members washing and preparing the body, dressing it in a shroud, and burying it in a simple pine coffin, or no coffin at all."[109] Although an ancient practice, it "emphasizes simplicity, equality in death, and return of the body to the earth."[110] Similar practices are also found in Muslim traditions, which include "bathing of a corpse, wrapping it in a cloth,

[103] *Id.* at 350.

[104] Megan Sickles, *Ashes to Ashes: America's First Crematorium*, Pa. Ctr. for the Book (Fall 2009), [ULR omitted]; Alfus, *supra* note 5, at 350.

[105] Haneman, *supra* note 39, at 518.

[106] *Id.* at 507.

[107] *Id.* at 519.

[108] Ann Hoffner, *Why are 12% of Green Burial Cemeteries Catholic?*, Green Burial Naturally (Feb. 7, 2017), https://www.greenburialnaturally.org/blog/2017/2/6/why-are-there-so-many-catholic-green-burial-cemeteries#:~:text=After%20an%20October,plants%20and%20trees.

[109] Claire Elise Thompson, *From Fiction to Reality: Could Forests Replace Cemeteries?*, Grist (Sept. 14, 2021), https://grist.org/fix/pollution/green-burial-forest-cemeteries/.

[110] *Id.*

and burying it without a casket, facing Mecca."[111] In Islamic and Jewish traditions, burials take place immediately following a person's death, which is in adherence to their respective religious texts.[112] Similarly, natural burials require the same swift transition from death to burial and are often referred to as an immediate burial.

2. How to Shift Public Perception: Burying or Burning Money

"Data shows that people's death care choices are motivated primarily by cost and simplicity rather than environmental concerns."[113] The average cost of a funeral in the East North Central region of the United States, which includes Illinois, Indiana, Michigan, Ohio, and Wisconsin, is $7,868.[114] The median cost of a traditional cremation in the same region is $6,953.[115] Green death options are significantly less expensive—a comparable package for a green burial in the same region is just $2,495.[116] Green cremation, or alkaline hydrolysis, "is approximately ten times cheaper than incineration," in part because the equipment used, a mortuary digester, is also significantly less expensive.[117] Human composting ranges from $3,000 to $7,000, and although a more expensive option, even the higher end of the price range remains less expensive than the average cost of a traditional funeral.[118]

Memorabilia such as jewelry starts at about $50 to $100 and can increase significantly, primarily depending on the materials used.[119] Living Urn is one of several companies that offer services that allow for an individual's ashes to turn into a growing tree and is the lowest cost option at $129 to $159.[120] Additionally, memorial reefs begin at $2,000

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[111] *Id.*

[112] *Id.*

[113] Alfus, *supra* note 5, at 360.

[114] *2021 NFDA General Price List Study Shows Funeral Costs Not Rising as Fast as Rate of Inflation*, Nat'l Funeral Dirs. Assn' (Nov. 4, 2021), https://nfda.org/news/media-center/nfda-news-releases/id/6182/2021-nfda-general-price-list-study-shows-funeral-costs-not-rising-as-fast-as-rate-of-inflation.

[115] *Id.* (indicating that traditional cremation includes an adult funeral with viewing and cremation).

[116] *See Natural Burial Plan*, Mich. Cremation & Funeral Care, https://michigancremation.com/funerals/natural-burial-plan/#:~:text=Natural%20Burial%20Plan%20%E2%80%93%20%242%2C495 (last visited Feb. 23, 2025) (Green burial costs in Michigan are priced at $2,495.).

[117] Alfus, *supra* note 5, at 343.

[118] *Id.* at 349.

[119] *See, e.g.*, *Cremation Rings*, Jewlery Keepsakes, https://www.jewelrykeepsakes.com/cremation-rings/?sort=pricedesc (last visited Nov. 20, 2023).

[120] *See Tree Pod Burial, Learn More About Our Tree Urn for Cremation and Ashes*, The Living Urn, https://www.thelivingurn.com/pages/tree-zip-code#:~:text=tree%2C%20which%20costs-,%24129.00%20to%20%24159.00, -%2C%20depending%20on%20

and can cost upwards of $8,000 for more extravagant pieces, but like most ash-related memorabilia options, it does not include the cost of cremation.[121] However, there are two things to consider: 1) fire cremation for the sole purpose of obtaining ash remains to use in memorabilia pieces is significantly less expensive;[122] and 2) if the memorabilia is made with remains from a green cremation, which is significantly less costly than a fire cremation, costs could be reduced even more.

Renewable energy practices have not yet been used in human corpse disposals, but generally speaking, renewable energy "is already cheaper than fossil fuels in a number of industries," and "research shows scaling up key green technologies will continue to drive their costs down—and the faster we go, the more we will save. Accelerating the transition to renewable energy is now the best bet not just for the planet, but for energy costs too."[123]

3. Social Equality

Banning traditional burials and cemeteries also promotes social equality because "the availability of death care is tied to wealth."[124] Without traditional cemeteries, there would no longer be a need for gravestones that are often reflective of status and wealth, depending on the material, size, and plot. Individuals would still have the option to choose a sustainable alternative that does away with an outward-facing status symbol.[125]

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the (last visited Nov. 20, 2022).

[121] *Eternal Reefs Fast Facts*, *supra* note 91; *see also Eternal Reefs & Donation Levels*, Eternal Reefs, https://www.eternalreefs.com/eternal-reefs-donation-levels/#:~:text=What%20is%20included%20with%20an%20Eternal%20Reef (last visited Mar. 31, 2025) (Note that the cremation itself is not listed as included with any of the Eternal Reef packages.).

[122] *Services*, Legacy Cremation Servs., https://www.legacycremationservices.com/services/#:~:text=Cremation%20Services%20From%20%24895%20-%20%241395 (last visited Feb. 17, 2025).

[123] James Ashworth, *Net Zero is Cheaper and Greener than Continuing the Use of Fossil Fuels*, Nat. Hist. Museum (Sept. 13, 2022), https://www.nhm.ac.uk/discover/news/2022/september/net-zero-cheaper-and-greener-than-continuing-use-fossil-fuels.html.

[124] Alfus, *supra* note 5, at 350.

[125] *See id.* at 352; *see also* Krupar, *supra* note 66, at 275 ("The governing of afterlife—particularly the material opportunities presented by the dead body—perpetuates inequalities and exclusions."); *id.* at 277-78 ("American organization of deathscapes and burial practices historically have reflected and legitimated social status divisions and inequities that existed among the living. Cemetery landscapes expressed 'the central paradox of equality and exclusivity': While advocating democracy and equality, many Americans went to great lengths to differentiate themselves in death, often organizing extravagant funeral processions and ostentatious monuments that contradicted the cultural geographies' steady rationalization of the cemetery.").

4. Economic & Market Advantages

Creating and promoting a new industry also establishes "a new occupation and source of employment—a part of the rising 'death-tech' industry."[126] More jobs would be created to service each type of green death option, but also in turning old cemeteries into parks, creating long-term jobs in parks, and recreational management. More parks would lead to a greater sense of community, as well as other socioeconomic benefits.[127] Funeral homes would not be affected or go out of business; they will continue with their trusted clientele and reputation by adjusting to the new practices and technology. Educating individuals on the wide array of green death options rather than the two primary dominators in the market—burials and cremations—would reclaim the market's competitiveness and encourage the industry as a whole to be more affordable and honest.

5. Shifting Mindsets

Death care preferences are changing, as a nationwide survey showed that "[i]n 2015, 64% of adults 40+ said they would be interested in green funeral options, compared with 43% in 2010."[128] The same study also indicated that "Americans have become increasingly indifferent to the cemetery as a sacred space or as a community and cultural institution."[129] Moreover, burial, in general, is losing popularity as the National Funeral Directors Association's (NFDA) 2021 Cremation and Burial Report showed that year's cremation rate was projected to be 57.5% and the burial rate was projected to be 36.6%.[130] According to NFDA's 2022 Consumer Awareness and Preferences Report, "60.5% would be interested in exploring 'green' funeral options because of their potential environmental benefits, cost savings or for some other reason, up from 55.7% in 2021."[131]

Traditional burials were not the primary choice until after the Civil War when they became common practice.[132] In fact, it was not until

[126] Alfus, *supra* note 5, at 359.

[127] *Why City Parks Matter*, City Parks All., https://cityparksalliance.org/about-us/why-city-parks-matter/ (last visited Nov. 22, 2022) ("City parks provide access to recreational opportunities, increase property values, spur local economies, combat crime, and protect cities from environmental impact.")

[128] Alfus, *supra* note 5, at 349.

[129] *Id.*

[130] NFDA, *Statistics* (Apr. 15, 2022), https://nfda.org/news/statistics (indicating that traditional burials are already the less popular option compared to cremation).

[131] *Id.*

[132] Cheryl Corley, *Burials and Cemeteries Go Green*, NPR (Dec. 16, 2007) https://www.npr.org/2007/12/16/17232879/burials-and-cemeteries-go-green.

well into the twentieth century that northern states' burial practices were adopted widely in the South. Moreover, in response to the pollution and high cost of burials, the first green cemeteries in the United States began in the South; the "71-acre swath of preserved forest land in Appalachia named Ramsey Creek Preserve, was opened by a family doctor in South Carolina in 1998."[133] The mindsets and attitudes of Americans toward death care practices have always been dynamic and it is not outside of the realm of possibility to shift to a mindset where traditional burials and cemeteries no longer exist.

6. International Perspectives

In other countries, graves are not granted in perpetuity. England is also facing burial space issues and is expected to entirely run out of burial space in the next few years, while some communities in England have already maxed out their burial space.[134] For example, two London boroughs have discontinued offering burial services.[135] In England, The Ministry of Justice (MoJ) oversees issues surrounding final disposition and "is responsible for burial law," dictating that "[l]ocal authorities are not legally bound to carry out burials but they are required to dispose of the dead."[136] The MoJ proposed the solution of grave re-use which "would involve lifting out remains from graves that are more than 75-years-old, burying them deeper in the same grave and then re-using the space on top."[137]

Other countries also now implement eco-friendly burials and deathscapes. For example, a cemetery in York, England consists of a meadow-type with paths leading to the graves, instead of traditional lawns.[138] Alkaline Hydrolysis is currently illegal in Britain, and Scotland only recently began considering the option after some states in the United States began to adopt it.[139]

Germany simply reuses the same grave space after several years and "[f]amilies in Spain and Greece, meanwhile, rent a 'niche,' an above-ground crypt where bodies lie for several years.[140] Even "Venice's San Michele island cemetery is similarly oversubscribed, with bodies removed after they

[133] Carla Bruni, *Green Burial and the North-South Divide*, JSTOR Daily (July 20, 2014), https://daily.jstor.org/green-burial-and-the-north-south-divide/.

[134] Alex Strangwayes-Booth, *Burial Space in England 'Could Run Out in 20 Years'*, BBC (Sept. 27, 2013), https://www.bbc.com/news/uk-24283426.

[135] John McManus, *The World is Running Out of Burial Space*, BBC (Mar. 13, 2015), https://www.bbc.com/news/uk-31837964.

[136] *Why City Parks Matter*, *supra* note 127; Strangwayes-Booth, *supra* note 134.

[137] *Why City Parks Matter*, *supra* note 127.

[138] Theodore James, Specialty Gardens, 163-64 (1992).

[139] McManus, *supra* note 135.

[140] *Id.*

have decomposed."[141] Further, "Israel has approved the creation of multi-story underground burial tunnels, despite opposition from some Orthodox Jews."[142] In China, new cemeteries and most burials in a densely populated southern province are now banned, and the government is encouraging cremation as an alternative in an effort to "save scarce farmland."[143]

D. Constitutionality

Because death practices are often tied to religious traditions and beliefs, questions of whether a ban would constitute government interference with one's freedom of religion under the First Amendment will arise.[144] Moreover, arguments will be made to establish religious exemptions that allow individuals to pursue a traditional burial for religious purposes. Although requiring a more complex and in-depth discussion on the constitutionality of the ban elsewhere, a rudimentary examination of the constitutionality will begin to reveal that these seemingly compelling arguments will likely fail on multiple planes.

First, by establishing a ban on traditional burials and cemeteries, Congress would neither be establishing a law that respects any specific religion, nor prohibiting the free exercise of a certain religion since the ban would apply to all individuals, regardless of religious affiliation.

Second, precedent from the Supreme Court and lower courts shows a consistent failure to establish "claims employing religion as a shield against government intrusions upon the environment."[145] In the 1990 case *Employment Division v. Smith*, the Court held that neutral and generally applicable regulations working to protect the environment but incidentally burden religion are subject only to rational basis review, and ultimately "would block the possibility of religious exemptions [that] erod[e] environmental regulations."[146]

1. Public Health Versus Strict Scrutiny

Congress did, however, pass two religious liberty statutes, the Religious Freedom Restoration Act (RFRA) and the Religious Land Use and Institutionalized Persons Act (RLUIPA). Both statutes re-established

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[141] *Id.*

[142] *Id.*

[143] *China Province Bans New Cemeteries*, Associated Press (Apr. 7, 1998), https://search.ebscohost.com/login.aspx?direct=true&db=n5h&AN=02d6e65d5e3715406d86885a2da6d63a&site=eds-live.

[144] *See* U.S. Const. amend. I ("Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof.").

[145] Justin W. Aimonetti & Christian Talley, *Religion as Sword, But Not as Shield: Rectifying the Estrangement of Environmentalism and Religious Liberty*, 22 Vt. J. Envt. L. 1, 3 (2021).

[146] *Id.* at 4.

the strict scrutiny test for religious challenges against the government, but now only in regard to land use to protect religious institutions from discriminatory zoning.[147] In doing so, to overcome such challenges, the government must prove it has a compelling state interest. Before RLUIPA was enacted, several environmental zoning laws were "upheld on grounds that environmental protection is a legitimate goal of local government and is permissible under its police power."

However, the courts have sided with public health protections that also often implicate environmental protections as well, over religious freedoms. For example, garbage collection and disposal were found to be a public health and welfare issue, which allowed the government to enact necessary laws and regulations.[148] New Jersey legislation states that "[t]he State needs to ensure that the public health and safety and the environment are protected from the risks posed by contaminated sites," which though proper regulation "will result in…the elimination of the public's exposure to these hazardous substances and the environmental degradation that contamination causes."[149] Regarding the disposal of human remains and the effects of the contamination, "it is clear that the State has a compelling interest" and can be easily established from "the risks to human health, the environment, or public policy."[150]

2. Environmental Preservation Wins Again

In implementing a full ban on traditional cemeteries and burials, religious exemptions should not be considered. If governmental action satisfies the strict scrutiny standard—demonstrating a compelling state interest and not imposing a substantial burden—then it inherently satisfies the requirements of any lower scrutiny standards. Arguably, religious preferences and requirements should not overcome the state's compelling interest in protecting the environment. Although typically in the context of land use and ordinances, courts point to a string of cases and precedents that ruled in favor of environmental preservation over religion in far less detrimental matters, or issues causing environmental damage on much smaller scales than all traditional burials and cemeteries combined.[151] For example, a court denied a church to be built because "preserving residential neighborhoods and protecting those areas from traffic, crowds, [and] disruption" was a compelling state interest.[152] It

[147] *Id.* at 5.

[148] *See* Allison N. Zsamba, *Shaimos Burials: Why Religion Should Yield to the State's Compelling Interest in Environmental Regulation and the Protection of Human Health*, 14 Rutgers J.L. & Religion 187 (2012).

[149] *Id.* at 207.

[150] *Id.* at 214.

[151] *Id.* at 205.

[152] *Id.* at 206.

could be contended then that if preserving neighborhoods from traffic satisfies the compelling state interest, then so should preserving natural resources, land use, air, soil, and water quality from the detrimental effects of traditional cemeteries and burials.

There are two predominant religious freedom claims to overcome: 1) claims under the Religious Land Use And Institutionalized Persons Act (RLUIPA); and 2) claims under the Free Exercise Clause.[153] First, "to establish a prima facie case that RLUIPA has been violated, a plaintiff must present evidence that the land use regulation in question: 1) imposes a substantial burden; 2) on the religious exercise; 3) of a person, institution, or assembly."[154] While the RLUIPA does not define "substantial burden," courts have generally adopted definitions meaning a burden that causes a religious exercise effectively impracticable.[155] The Free Exercise Clause protects religious practices that are sincerely held, and religious in nature in the claimant's scheme of things.[156]

Traditional burial ceremonies that require embalming fluids or a specific type of casket are neither mandated by any major religion nor are natural burials that do not require embalming fluids or natural caskets prohibited.[157] Thus, banning such practices should not violate

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[153] 42 U.S.C. § 2000cc-2(b) (2000); U.S. Const. amend. I.

[154] Grace United Methodist Church v. City of Cheyenne, 234 F. Supp. 2d 1186, 1193-94 (D. Wyo. 2002) (internal quotations omitted); Westchester Day Sch. v. Vill. of Mamaroneck, 379 F. Supp. 2d 550, 555 (S.D.N.Y. 2009).

[155] *See* Civ. Liberties for Urb. Believers v. City of Chicago, 342 F.3d 752, 761 (7th Cir. 2003); Muslim Ctr. of Somerset Cnty. v. Zoning Bd. of Adjustment, 2006 WL 1344323, at *7 (N.J. Sup. Ct. May 16, 2006); Midrash Sephardi, Inc. v. Town of Surfside, 366 F.3d 1214, 1227 (11th Cir. 2004) (A substantial burden, "must place more than an inconvenience on religious exercise.…It is akin to significant pressure which directly coerces the religious adherent to conform his or her behavior accordingly. Thus, a substantial burden can result from pressure that tends to force adherents to forego religious precepts or from pressure that mandates religious conduct."); San Jose Christian Coll. v. City of Morgan Hill, 360 F.3d 1024, 1034 (9th Cir. 2004) (A substantial burden "must impose a significantly great restriction or onus upon such exercise."); Adkins v. Kaspar, 393 F.3d 559, 570 (5th Cir. 2004) (A substantial burden exists "if it truly pressures the adherent to significantly modify his religious behavior and significantly violate his religious beliefs."); Zsamba, *supra* note 16, at 202 (In the context of the Free Exercise Clause, the Supreme Court has concluded that for RLUIPA purposes, "a substantial burden on religious exercise occurs when a state or local government, through act or omission, puts substantial pressure on an adherent to modify his behavior or to violate his beliefs.").

[156] Jacques v. Hilton, 569 F. Supp. 730, 732-33 (D.N.J. 1983) (citing Africa v. Pennsylvania, 662 F.2d 1025, 1029-30 (3d Cir. 1981); *see also* Zsamba, *supra* note 16, at n. 66 (No Free Exercise Clause violation should be found when "[t]he community is not being asked to completely cease and desist from practicing an essential tenet of their religion. Rather, the NJDEP is requesting that they continue their practice in a manner that will not cause irreparable harm to the environment and human health.").

[157] *Embalming Explained*, Funeral Consumers All., https://funerals.org/get-help/making-decisions/embalming-explained/#:~:text=Do%20any%20religions%20

the RLUIPA or Free Exercise Clause. Such a ban would not make the practice of burying the deceased impracticable because other viable options, such as green burials and natural park solutions, exist, which would not coerce individuals to modify their practices in ways that violate their beliefs.

Similarly, if ash-memorabilia methods are found to be just as effective when using liquefied remains produced by green cremation method, there would no longer be a need for incineration cremation. If these practices can only be completed with traditional ash remains, it would be counterintuitive to restrict individuals from pursuing options that are more sustainable alternatives to traditional burials. To rectify some of the harmful effects of cremations, the government could impose a ban on scattering ashes and pre-incineration embalming. The government could also implement regulations that mandate the use of biodegradable urns for burials and require crematories to take additional measures to remove mercury fillings and other air pollutants before incineration.

E. A Total Ban is Needed

As the United States and the rest of the world continue to face serious practical and environmental issues associated with the rapid decrease of available burial space, a total ban on traditional burials and cemeteries is necessary to promptly address these issues. Federal oversight is also necessary to ensure proper implementation and regulation of funeral practices to avoid confusion and to protect people from dishonest business practices.

1. No Trees in Court

Often, these environmental issues are left behind within the chambers of the court. The problem arises when a case is decided on a matter, and the case law created is very narrow. When aiming for greater, widespread change, "[c]ourt action is unsatisfactory because of the expense, time consumption, and uncertain results. Every trial involves distinguishable facts, thus yielding law limited in scope. Legislation, however, deals with inclusive types of situations and prevents damage before it occurs."[158]

forbid%20it,have%20no%20need%20for%20embalming (last visited Apr. 8, 2025) ("Though embalming has no roots in Christian religion, it is neither discouraged nor encouraged. Muslim, Bahá'í and orthodox Jewish faiths consider embalming to be a desecration of the body, and prohibit it. Hindus and Buddhists choosing cremation have no need for embalming.").

[158] Martin K. Magid, *Land Use, Aesthetics and the State Legislature*, 19 Wayne L. Rev. 73, 73 (1972).

2. Government, Who?

Virtually no federal regulations exist in relation to funerary practices or dispositions of the deceased.[159] Funerals and cemeteries fall under state control, and ultimately, the states decide every factor that goes into the disposal of human remains.[160] States have the authority to regulate various aspects of burials, including the types of containers permitted, the materials used, the locations of burial sites, and the types of funerary services that may be offered.[161]

States regulate various death care practices, including embalming requirements, refrigeration timelines, concrete liner mandates, and other related protocols to ensure public health and safety.[162] In states that do not enforce these regulations, the determination is left up to individual cemeteries' and funeral homes' policies.[163] Despite every state having to manage the disposition of a human body, the practices, policies, and rights differ greatly from one state to the next,[164] indicating the need for federal regulation to ensure consistency and avoid misinformation.[165]

3. Consumer Protection

Current laws often interfere with one's choice of funeral services.[166] As of 2022, only 318[167] of over 144,000 cemeteries offer

[159] Coutts et al., *supra* note 4, at 135 ("Aside from the…Federal Trade Commission's funeral rule, which sets parameters on how funeral services are priced and marketed, there are no federal regulations on the handling or disposition of the deceased. Thus, the control of disposition practices falls to the states and local governments.").

[160] *Id.*

[161] *Id.*

[162] *Id.*; Thompson, *supra* note 109.

[163] *Id.*

[164] *See id.*

[165] *See generally* Franco et al., *supra* note 9, at 9 ("[T]he elaboration of laws and rules regarding the funeral industry is extremely necessary. Despite the proven damage these contaminants generate, unfortunately, there is a worldwide consensus that the funeral industry is under-regulated. This is because in many countries activities aimed at funeral services are excluded from routine environmental surveillance systems. Furthermore, in most countries such as the United States, this sector is not included in the health industry, therefore, they are the responsibility of outsourced services, with less control in the management of generated waste.").

[166] David E. Harrington & Kathy J. Krynski, *The Effect of State Funeral Regulations on Cremation Rates: Testing for Demand Inducement in Funeral Markets*, 45 J.L. & Econ. 199-222 (2002).

[167] Lee Webster, *Bringing Green Burial to New Hampshire*, N.H. Funeral Res. & Educ., https://www.nhfuneral.org/green_burial_new_hampshire.html (last visited Nov. 22, 2023).

green burials.[168] Moreover, "[s]ome states require embalming or refrigeration of bodies that have been dead for more than [twenty-four] hours. If families haven't planned ahead, that doesn't leave much time to make arrangements at a natural burial ground."[169] Codification of green funeral options "not only accepts people's changing views on death care but also provides clarity for those who might not otherwise know about the death care options available to them."[170] The wide range of funeral options being withheld from consumers, either purposefully or omitted due to lack of availability, under the current state-governed scheme puts the consumer's power of choice at risk.[171] The United States funeral practices are built upon a commercial model, as private companies manage most of the industry. Making options more well-known and consistent across all states only improves public awareness, which "is crucial for consumer welfare because normally, 'the funeral transaction is…influenced by…the disorientation caused by bereavement, the lack of standards by which to judge the value of the commodity offered by the seller, the need to make an on-the-spot decision, [and] general ignorance of the law.'"[172]

Deceptive practices also impact consumers' choices. Since green funeral options are less expensive, funeral directors who have families choose a green option over a traditional burial are compensated less.[173] With that in mind, funeral directors are not incentivized to promote or adopt green funeral practices.[174] This raises ethical questions as "[f]uneral directors have long been known to use deceptive techniques, such as grief counseling, to trick consumers into buying a more expensive service."[175] The data is consistent in showing that funeral directors are responding to these profit losses by "persuading more consumers to choose traditional funerals over less-profitable" options.[176]

[168] Thompson, *supra* note 109.
[169] *Id.*
[170] Alfus, *supra* note 5, at 350.
[171] *See generally id.* at 349.
[172] Alfus, *supra* note 5.
[173] Michalska, *supra* note 63.
[174] *Id.*
[175] *Id.* at 1014-15.
[176] Harrington & Krynski, *supra* note 166.

Conclusion

A federal ban on traditional burials and cemeteries benefits the greater society in several ways: it would protect the environment from further harm, protect individuals from contamination and pollutants, and protect one's choice (and bank account) in their final disposition. The ban also does not impose any burdens on individuals with specific religious beliefs, as a burial option still exists. The ban would, in turn, promote green alternatives to be offered in every state so funeral directors remain competitive. The funeral industry will continue to profit and participate in a competitive market without ethical ramifications.

Although cremation also poses environmental threats, until further research is conducted on the use of green cremation alternatives combined with other green funeral practices, it is difficult to support a full ban on cremation without a definite analogous alternative. Perhaps, as a result of a ban and individuals moving away from traditional burials, researchers would be incentivized to continue developing green alternatives.

Our final return to the earth appeals to many of differing faiths and spiritualities, and green death services speak directly to that desire by allowing us to truly become one with nature and not be preserved as some unbiodegradable material. Thus, it is time for our death options to be as consistent and natural as death itself.

Carp as an Invasive Species: Regulation Effects on the Economy, Ecosystem, and Environment

Quinlan Sharkey*

Introduction

Asian carp have been invading and causing harm to United States waterways for decades. The species' presence adversely affects the environment and threatens native fish populations by altering the aquatic community, reducing water quality, and reproducing rapidly. The species can even threaten human safety. Invasive carp not only impact ecosystems and the environment, but also affect the economy due to the harm they inflict on commercial fisheries, which depend on the health of United States waterways. Federal and state governments are well aware of the threat posed by this invasive species, but have been slow to respond due to political considerations by lawmakers. One way to respond to the ongoing regulatory issue is to urge governmental entities to consider new regulations to combat the negative effects of invasive carp. If more anticipatory actions were taken by legislators, along with corrective actions to aid anticipatory actions, the environmental and economic effects of invasive carp in the United States would be greatly

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diminished. Law and legislation give power that could significantly change the outcome of the issue, and both actions are needed to combat the major invasive carp problem within the United States.

Preventative control methods for invasive carp are also a possible solution to the problem, but additional methods are still required to aid these preventative measures in mitigating the species' negative effects. Once invasive carp have entered a waterway, it is almost impossible to eradicate them. Many methods exist for controlling the species, but one method that has not been implemented as often as it should is the use of bounties. This Article examines the issues of invasive carp on the economy, ecosystem, and environment in depth, and offers possible solutions to combat the species.

I. History of Invasive Carp

The term "Asian carp" refers to five species of carp—Bighead, Black, Crucian, Grass, and Silver—which are members of the cyprinid family and are related to several varieties of minnows.[1] These carp are native to the rivers, reservoirs, and lakes in China and southern Russia. Invasive carp arrived in the United States with the increase of immigrants during the 1800s.[2] Between 1815 and 1860, more than five million immigrants arrived in America.[3] These populations—especially European and Asian immigrants—often viewed carp as a delicacy.[4] Many of these immigrants were disappointed that this vast new land they had embarked on had no signs of the cherished fish that was fostered in their cultures.[5] Carp was a cultivated food source, garden element, and symbol of strength in Asia for centuries, and similarly so in Europe.[6] These cultures also value carp as one of the most desirable fish to consume, and revere carp as a symbol of prosperity and longevity.[7]

Inspired by the influence carp had on immigrant populations at the time, entrepreneurs began importing the fish, hoping it would provide a lucrative food staple. For example, Julius A. Poppe was a successful entrepreneur who imported a stock of five common carp from Germany in 1872 and then expanded his stock into a thriving farm in California by 1876.[8] Poppe and many other entrepreneurs heavily lobbied for the cultivation of carp into the United States for business

[1] *History of Common Carp in North America*, Nat'l Park Serv., https://www.nps.gov/miss/learn/nature/carphist.htm (Mar. 6, 2023).

[2] *Id.*

[3] *Id.*

[4] *Id.*

[5] *Id.*

[6] *Id.*

[7] *Id.*

[8] *Id.*

purposes because the success of the few carp farms at the time proved to be profitable. In 1871, President Grant appointed a fish commission to oversee the country's fisheries called the United States Commission of Fish and Fisheries. One mission of the commission was to find a species of fish that could replace or supplement the overall fish population in the United States.[9] The U.S. Commission of Fish and Fisheries felt pressure from the public for the cultivation of carp and to make carp more available.[10]

At the time, the United States suffered a decline in native fish stocks after almost a century of exploitation and overfishing.[11] In 1876, President Grant appointed Dr. Spencer F. Baird of the Smithsonian Institution to be the head of the U.S. Commission of Fish and Fisheries.[12] While he was appointed, Baird looked for a fish that could replenish the United States' fish populations, and he received information about the common carp, which was native to Europe.[13] At the time, Baird noted that the European carp had many benefits, such as, "rapid growth, adaptability, harmlessness to other fishes, and good table qualities."[14] By 1880, the commission received nearly 2,000 letters per year requesting that carp become more accessible.[15]

In 1877, the U.S. Commission of Fish and Fisheries began a serious effort of carp cultivation and "imported 345 common, mirror, and leather carp and placed them in ponds in Baltimore."[16] Some of these fish were then transferred to waters "in Washington D.C., where they soon had produced over 6,000 carp fingerlings that were shipped to 273 applicants in [twenty-four] states."[17] It is believed that this marked the beginning of the invasive carp's infestation in North America, driven by the fish's remarkable ability to live and reproduce in almost any water condition, which allowed it to quickly infiltrate bodies of water.[18]

Nearly a century later, a second massive surge of invasive carp occurred. Asian carp were introduced to aquaculture ponds and wastewater treatment facilities in the 1970s to help clear weeds and parasites.[19] Carp were also used as a method to control nuisance algal

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[9] Rob Buffler & Tom Dickson, *Old World and New World Carp*, Am. Carp. Soc'y (last visited Sept. 28, 2023).

[10] *Id.*

[11] *Id.*

[12] *Id.*

[13] *Id.*

[14] *Id.*

[15] *Id.*

[16] *Id.*

[17] *Id.*

[18] *See id.*

[19] *Protecting Our Waterways: Examining Federal Efforts to Control Asian Carp in Kentucky: Hearing Before the Subcomm. on Interior, Energy, & Env't of the H. Comm. on Oversight & Gov't Reform*, 115th Cong. 2 (2018) (statement of Allan

blooms and sometimes used as a new source of human food.[20] Asian carp proved helpful for these methods because the presence of weeds and parasites greatly diminished, but the carp quickly and successfully invaded nearby waters, causing another injurious invasion of aquatic ecosystems.[21] Flood waters then caused carp to spread into local rivers, streams, and lakes.[22] Due to the species' adaptability, large portions of river systems in the United States are now occupied by one or more species of carp, and they are well established in forty-five states.[23]

II. How Asian Carp Are Invasive

Asian carp impose multiple adverse ecological effects. The fish consume large amounts of food daily and outcompete native fish for available feeding opportunities.[24] Carp feeding also diminishes plankton abundance and alters local ecological composition by facilitating the dominance of indigestible phytoplankton.[25] Invasive carp are large, relative to other native species, and can jump up to ten feet above the water surface.[26] Carp will jump out of the water when they are stimulated by passing boats and watercrafts.[27] This poses a safety risk to boaters because carp can weigh up to thirty pounds and can injure those out on the water.[28] According to one study on the species, a silver carp that was 747 millimeters in length jumped an average of 2.1 meters at a speed of 8.56 meters per second, with a hangtime of 1.06 seconds.[29] This issue contributes to the spread of invasive carp because they have the ability to jump over barriers, such as low dams.[30] Also, heavy rains causing intense flooding can connect bodies of water that are normally connected. This flooding then allows the carp to pass through what

Brown, Assistant Regional Director, Southeast Region, U.S. Fish & Wildlife Serv., Dep't of the Interior).

[20] *Id.*

[21] *Id.*

[22] *Id.*

[23] *Id.*

[24] *Id.*

[25] *Id.*

[26] *Are Invasive Carp Dangerous?*, U.S. Geological Surv., https://www.usgs.gov/faqs/are-invasive-carp-dangerous (Mar. 8, 2024).

[27] *Id*.

[28] *Id.*

[29] Glenn R. Parsons et al., *Estimating Burst Swim Speeds and Jumping Characteristics of Silver Carp (Hypophthalmichthys molitrix) Using Video Analyses and Principles of Projectile Physics*, ResearchGate 5 (2015), https://www.researchgate.net/publication/294719275_Estimating_Burst_Swim_Speeds_and_Jumping_Characteristics_of_Silver_Carp_Hypophthalmichthys_molitrix_Using_Video_Analyses_and_Principles_of_Projectile_Physics.

[30] *Invasive Carp Overview*, Nat'l Park Serv., https://www.nps.gov/miss/learn/nature/ascarpover.htm (Mar. 6, 2023).

otherwise would be a barrier.[31] Furthermore, high water can create an "open river" condition, requiring dams to open their floodgates and allow the carp to pass through to different areas.[32]

Moreover, carp's reproductive preferences also contribute to their invasive nature. Adult carp prefer slower-moving water but migrate to high, fast-moving waters during their spawning seasons.[33] One female carp can lay around 300 eggs at a time in these areas, and these eggs can spread quickly due to the fast-moving water they are laid in.[34] Carp have the ability to adapt to many different environments, making them even more difficult to eradicate once they have infiltrated a body of water. For example, a study by the American Physiological Society found that cooling water temperatures prompt some carp species to store extra amounts of glycogen in their brain to survive winter.[35] When water temperatures get colder, many fish will adapt physiologically to survive the cold months.[36] Scientists observe fish sodium-potassium pump activity to measure their energy levels.[37] This anatomical part is what allows the fish to keep its cell function in balance in the face of extreme conditions.[38] The pump sends signals to the fish's brain to transmit information among cells, which causes the fish to use large amounts of energy.[39] The fish's body stores its carbohydrates in glycogen, which is the energy supply that vital organs use to survive reduced oxygen levels in water, otherwise known as "anoxia."[40] Glycogen is not typically abundant in the fish's brain, even though it is a large source of energy for other parts of the fish.[41] Glycogen is mostly found in livers and muscles.[42] Further research in this area may produce additional methods for controlling the overpopulation of invasive carp.

After a twelve-month study, scientists found that crucian carp had higher levels of glycogen in their brains than other fish had during colder months, and primarily used glycogen as their energy source, rather than the sodium-potassium pump.[43] The pump's function uses more energy than the use of glycogen does. During the winter, carp use

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[31] *Id.*

[32] *Id.*

[33] *Id.*

[34] *Id.*

[35] Matti Vornanen, *Physiology Allows Crucian Carp to Survive Without Oxygen*, Phys.org (Aug. 25, 2006), https://phys.org/news/2006-08-physiology-crucian-carp-survive-oxygen.html.

[36] *See id.*

[37] *Id.*

[38] *Id.*

[39] *Id.*

[40] *See id.*

[41] *See id.*

[42] *Id.*

[43] *Id.*

less energy than other fish, which increases their chances of survival.[44] The researchers "found that as the water got colder in October and November, the carp began to consume less energy (sodium pump slows) and build up their glycogen (carbohydrate) stores, even though the water still had plenty of oxygen."[45] Simply put, carp store their glycogen levels in the fall to prepare for the winter. Their glycogen stores are used for energy rather than relying on the sodium-potassium pump like other fish normally would during cold months.[46]

The vast amounts of glycogen in the carp's brain keep it functioning and healthy from February to April, which is when oxygen is depleted in the water.[47]

> [T]he carp brain's sodium-potassium pump activity, a measure of energy demand, decreased 10-fold to its low point between February and April, said the study's lead author, Vesa Paajanen. Taken together, these findings indicate the carp extends the amount of time it can survive without oxygen in frigid water by 150-fold.[48]

Further, carp have the ability to shift their size and shape to avoid predators.[49] Specifically, when carp live in large bodies of water, they shift their bodies to make themselves shorter and fatter.[50] This shifting ability makes it difficult for some predators to grab the carp with their mouths because the carp are too wide for the predators' jaws to successfully grasp the carp's bodies. When crucian carp live in smaller bodies of water, they can elongate their bodies so they will move less during the winter.[51] This reduction in movement causes them to not use as much energy as a smaller fish would to get from point A to point B. The species' adaptability must be considered to develop methods to control their populations. Without close consideration of the unique biological modifications of carp, efforts to control their population numbers could be unproductive. Future policy implementations must confront these variables to attain any success.

From disturbing aquatic food chain systems by consuming large amounts of plankton to their physical jumping abilities that lead to their

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[44] *Id.*

[45] *Id.*

[46] *Id.*

[47] Am. Physiological Soc'y, *Remarkable Physiology Allows Crucian Carp to Survive Months Without Oxygen*, Sci. Daily (Aug. 26, 2006), https://www.sciencedaily.com/releases/2006/08/060825103548.htm#.

[48] *Id.*

[49] *Id.*

[50] *Id.*

[51] *Id.*

expansion in other waterways, invasive carp cause a variety of harmful ecological and recreational impacts.[52] Releasing only a few carp into any body of water can quickly become a huge problem. Their adaptability and disruption of native ecosystems cause the Asian carp to become invasive by harming the environment and, in some cases, human health.

III. Laws Aimed at Combatting Asian Carp and Other Species

Federal and state governments fully recognize the invasive carp problem, but have been slow to respond due to political considerations by lawmakers. Although regulations for the invasive species have not been a significant priority for legislators, there are some regulations in place to combat the carp's spread. The National Invasive Species Act of 1996 (NISA) amended the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 to mandate regulations to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through ballast water.[53] The Act defines "nonindigenous species" as "any species or other viable biological material that enters an ecosystem beyond its historic range, including any such organisms transferred from one country into another."[54] The term "aquatic nuisance species" is defined as "a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters."[55]

NISA calls for a National Ballast Water Control Program, which will study ballast water exchange and its impact on the diversity and abundance of native species.[56] NISA also establishes a Task Force to develop and implement a program to prevent and control aquatic nuisance species in U.S. waters.[57] Additionally, the governor of each state may, after notice and opportunity for public comment, prepare and submit to the Task Force a comprehensive management plan for aquatic nuisance species.[58] The governor can also submit to the Assistant Secretary of the Army a public facility management plan to help reduce infestations of invasive species.[59] For example, in Michigan,

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[52] *Id.*

[53] National Invasive Species Act of 1996, Pub. L. No. 104-332, 110 Stat. 4073 (codified at 16 U.S.C. § 4714).

[54] National Invasive Species Act of 1996 § 2(a)(2), 16 U.S.C. § 4702.

[55] *Id.*

[56] Eugene H. Buck, Cong Rsch. Serv., RL32344, Ballast Water Management to Combat Invasive Species 2-3 (2012).

[57] *Id.*

[58] *Id.*

[59] *Id.*

the Act requires ships entering the Great Lakes to exchange their ballast water with salt water from the ocean.[60] "This reduces the number and survivability of organisms in the tanks. Some ships come in fully loaded with no ballast on board, so they do not have to do the ballast exchange. However, some unpumpable material still remains in the tanks that can contain organisms."[61]

The primary federal regulation that applies to Asian carp management in the United States is the Lacey Act, which is implemented by the U.S. Fish and Wildlife Service (USFWS), Departments of Agriculture, Commerce and Interior, the Animal and Plant Health Inspection Service (APHIS), and the National Marine Fisheries Service.[62] The Act classifies three species of carp as "injurious."[63] This declaration is intended to prevent interstate shipment of live invasive species.[64] The 2008 Farm Bill amended the Lacey Act and broadened protections for many plants, animals, and plant products.[65] Without an import declaration, it is unlawful to import certain products, including certain species.[66] These agencies currently enforce the declaration requirement for commercial shipments only.[67]

Only seven states—Alaska, Maryland, Maine, Michigan, Montana, New Hampshire, and Vermont—completely prohibit the possession of grass carp.[68] Wisconsin, Minnesota, and Massachusetts prohibit the possession of grass carp, except with a permit for use in controlled waters and solely for research and education purposes. More restrictive states have enacted total bans on the possession of Asian carp.[69] Other states allow the use of triploid (sterile) grass carp.[70] Many political interventions have been used to slow the regulation of invasive carp due to commercial interests in the fisheries in aquaculture industries. For example, in 2000, the Mississippi Interstate Cooperative Resource Association (MICRA) petitioned USFWS to list black carp as

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[60] *Id.*

[61] *FAQ: Ballast Water*, Dep't of Env't, Great Lakes, & Energy, https://www.michigan.gov/egle/faqs/water-resources-protection/ballast-water (last visited Nov. 17, 2023).

[62] *Lacey Act*, U.S. Dep't of Agric., https://www.aphis.usda.gov/sites/default/files/fsc-lacey-act.pdf (last visited Apr. 2, 2025).

[63] National Invasive Species Act of 1996, Pub. L. No. 104-332, 110 Stat. 4073 (codified at 16 U.S.C. § 4714).

[64] *Id.*

[65] *Id.*

[66] *Id.*

[67] *Id.*

[68] Jerry L. Rasmussen, *Regulations as a Tool in Asian Carp Management*, Am. Fisheries Soc'y 182 (2011), https://fisheries.org/docs/books/54074P/12.pdf.

[69] *Id.*

[70] *Id.* at 179.

an injurious species under the Lacey Act.[71] MICRA's reasoning was to protect endangered snails and mollusks from black carp because black carp were outcompeting the mollusks for food resources.[72] MICRA represented the "interests of [twenty-six] of [twenty-eight] member states in the Mississippi River basin."[73] It took seven years for the listing of the black carp to be an injurious species due to commercial interests in the aquaculture industries that had political intervention by government regulators.[74] At that time, fish farmers, primarily near Mississippi, had just begun using black carp as an agent to control snail populations in their catfish ponds.[75] MICRA used these carp to decrease the populations of snails in that area because the snails served as a host for a parasite that commonly infected catfish and diminished catfish's marketability for farmers.[76]

Because of this delay in listing the black carp as "injurious" under the Lacey Act, some states were forced into tough political situations. The Missouri Department of Conservation experienced political fallout due to the MICRA petition.[77] The MICRA chairman at the time was also the Missouri Fisheries Chief and was subject to much scrutiny by the political and economic interests of the aquaculture industry in Missouri to reach a compromise for the listing of the black carp.[78] A portion of the agreement was that, beginning in 2000, "Missouri would…hold fertile (diploid) black carp in a state fish hatchery and supply sterile (triploid) black carp to fish farmers in Missouri for a period of [five] years for snail control before banning the fish altogether."[79]

During this time, the use of black carp by commercial fishermen allowed these fish to infiltrate other states' waters.[80] Specifically, black carp escaped captivity in Louisiana and established wild populations in the tributaries and certain reaches of mainstream areas in the lower Mississippi River basin.[81] This caused a widespread invasion by the black carp in southern states.[82] There have also been other attempts to list carp as injurious. For example, Wisconsin Congressman Mark Green attempted to list Asian carp by introducing legislation to list bighead and silver carp under the Lacey Act, but this bill never reached

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[71] *Id.* at 176.
[72] *Id.*
[73] *Id.*
[74] *Id.*
[75] *Id.*
[76] *Id.*
[77] *Id.*
[78] *Id.*
[79] *Id.* at 176-77.
[80] *Id.* at 177.
[81] *Id.*
[82] *See id.*

the floor of Congress.[83] Illinois Congresswoman Judy Biggert similarly took action to introduce legislation to list most carp as injurious under the Lacey Act.[84] These actions, along with some others, were eventually successful in listing some species of carp as injurious.

Black and silver carp were eventually listed as injurious under the Lacey Act, which prohibits their importation and transportation between the continental United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any territory in the United States' possession.[85] The issue here was that even though the black carp was eventually listed and regulated, it had already spread to other areas and multiplied its population size tenfold. Also, listing a species under the Lacey Act does not regulate a species that has already substantially invaded U.S. waters; it only regulates the importation and transportation of the species. Therefore, the Lacey Act amendment did not address the black carp's invasion of the United States because the invasion was already prevalent.[86] The Lacey Act does not provide for control methods or measures, so it is not very helpful for Asian carp management because it cannot manage the carp that are already in the United States and spreading on their own.[87] Regulations such as the Lacey Act have controlled the overall regulation of invasive carp just by prohibiting the importation or transportation of the species. Although this is somewhat helpful in carp management, it does not even touch on the issue of invasive carp already in the country.

A federal case attempted to regulate invasive carp that caused harm to the Chicago Area Water System (CAWS) and, in turn, the Great Lakes. According to the Seventh Circuit Court of Appeals in *Michigan v. United States Army Corps of Engineers*, environmental damage caused by invasive species constitutes a public nuisance.[88] "States bordering the Great Lakes filed [a] lawsuit against Army Corps of Engineers and municipal water reclamation district, which together owned and operated the [CAWS]."[89] They sought a "preliminary injunction that would require the defendants to put in place additional physical barriers

[83] *Id.*

[84] *Id.*

[85] *See* Injurious Wildlife Species; Black Carp (Mylopharyngodon piceus), 72 Fed. Reg. 59019-02 (Oct. 18, 2007) (codified at 50 C.F.R. § 16.13 (2007)) (which added black carp to the Lacey Act), *and* Injurious Wildlife Species; Silver Carp (Hypophthalmichthys molitrix) and Largescale Silver Carp (Hypophthalmichthys harmandi), 72 Fed. Reg. 37459-01 (July 10, 2007) (codified at 50 C.F.R. § 16.13 (2007)) (adding silver carp to the Lacey Act).

[86] *Lacey Act*, Animal and Plant Health Inspection Service U.S. Department of Agriculture, https://www.aphis.usda.gov/publications/plant_health/fsc-lacey-act.pdf (last visited Apr. 2, 2025).

[87] *See generally* Lacey Act, 18 U.S.C. § 42.

[88] 667 F.3d 765, 772 (7th Cir. 2011).

[89] *Id.* at 765.

throughout the CAWS, implement new procedures to stop invasive non-native species of carp, and expedite a study of how best to separate the Mississippi and Great Lakes watersheds permanently."[90] The legal argument behind this was that invasive carp constituted a public nuisance because the fish caused environmental damage.[91] Public nuisance law has been traditionally understood to cover a wide range of issues.[92] Federal courts may grant injunctions against conduct that affect air and water, which constitute a nuisance. Environmental damage may constitute a nuisance, even if the damage consists of enabling the invasion of a new species rather than dumping pollutants.[93]

The United States District Court for the Northern District of Illinois denied a motion for a preliminary injunction, and the states appealed to the United States Court of Appeals for the Seventh Circuit.[94] Traditionally, public nuisance is defined as a "substantial and unreasonable interference with a right common to the general public, usually affecting the public health, safety, peace, comfort, or convenience."[95] The states also argued that the National Invasive Species Act (NISA) directed "the [Army] Corps and task force to 'investigate and identify environmentally sound methods for preventing and reducing the dispersal of aquatic nuisance species between the Great Lakes [Basin] and the Mississippi River [Basin] through the Chicago River Ship and Sanitary Canal,' including any methods that could be incorporated in the normal operation of the CAWS."[96] Essentially, the states argued that the Army Corps was not acting accordingly under NISA by failing to attempt to reduce the dispersal of invasive carp.[97] The defendants' failure to close parts of the CAWS to avert the crisis of Asian carp invading the Great Lakes created a grave risk of harm, and a violation of federal public nuisance common law.[98]

Unfortunately, the suit's attempt to protect the Great Lakes by regulating invasive carp was unsuccessful. The Seventh Circuit held that although the states established a good and substantial likelihood of success on the merits, the balance of harms favored the defendants.[99] To determine a remedy like a preliminary injunction, "the court must balance the competing claims of injury and must consider the effect on each party of

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[90] *Id.*

[91] *Id.*

[92] *Id.* at 772.

[93] *See generally* Kathryn Saenz Duke, *Using RCRA's Imminent Hazard Provision in Hazardous Waste Emergencies*, 9 Ecology L .Q. 599 (1981).

[94] *See* 667 F.3d 765, 769 (7th Cir. 2011).

[95] *Id.* at 771 (citing Restatement (Second) of Torts § 821B (Am. L. Inst. 1965); Dan B. Dobbs, The Law of Torts § 467 at 1334 (2000)).

[96] *Id.* at 779.

[97] *Id.*

[98] *Id.* at 768.

[99] *Id.* at 769.

the granting or withholding of the requested relief."[100] The court reasoned that the likelihood of harm from invasive carp on the Great Lakes would be irreparable, but "[t]he defendants, in collaboration with many agencies, had substantially attempted to stop the carp from reaching the Great Lakes, and this group has promised that additional steps will be taken in the near future."[101] The court determined that the district court was correct to deny preliminary relief in this case, stating that "[i]t would be arbitrary to conclude that this type of action extends to the harm caused by industrial pollution but not to the environmental and economic destruction caused by the introduction of an invasive, non-native organism into a new ecosystem."[102] The court also warned the Army Corps and agencies that if they do not continue to act accordingly to stop the invasion of Asian carp, this conclusion can be revisited.[103]

The Seventh Circuit Court of Appeals came to this conclusion for two reasons. First, there are a number of problems with the relief package requested by the plaintiffs. The court doubted that the proposed injunction would successfully reduce the risk that carp will invade the Great Lakes during the time of the full trial.[104] This injunction "would impose substantial costs on the defendants and the public interest they represent as well as added expenses for [recreational purposes]."[105] Second, the court wanted to avoid any injunction that would divert scarce resources, "from science to bureaucracy."[106] It is unlikely that the injunction will prevent harm, and it will impose many costs on the Army Corps and related agencies when there are already engagements by the government to regulate invasive carp.[107] The court reasoned that "there is a powerful array of expert federal and state actors that are engaged in a monumental effort to stop invasive carp from entering the Great Lakes."[108]

Such a case illustrates that although most courts recognize that invasive carp are harmful to the United States' waterways for several reasons, they will likely favor cost concerns and commercial interests over environmental concerns. Many other environmental issues and movements are confronted with the same battle over cost interests from regulators and courts.

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[100] *Id.* at 789 (quoting Winter v. Natural Res. Def. Council, Inc., 555 U.S. 7, 24 (2008)).

[101] *Id.* at 769.

[102] *Id.* at 771.

[103] *Id.* at 769.

[104] *Id.* at 789.

[105] *Id.* at 789-90.

[106] *Id.* at 790.

[107] *Id.*

[108] *Id.*

IV. Economic Effects and Incentives of Invasive Carp

The commercial fishing industry depends heavily on the health and ecological state of the Great Lakes. The total value of commercial fisheries in the Great Lakes during 2011 was over $33 million.[109] Today, the Great Lakes commercial, recreational, and tribal fisheries are valued at $7 billion, annually.[110] The economic impacts of Asian carp include, but are not limited to:

> [I]ncreased costs and decreased revenues for commercial harvesters, various small fish would be impacted through direct consumption by Asian carp, increased competition for food resources with young and mature native species, and the decrease in revenue would in turn reduce the level of gross profits and thereby create a circular flow of impact.[111]

Another major threat to the commercial fishing sector is invasive carp's impact on the quality of native species because it is expected to reduce as total population numbers decline. From a demand perspective, these adverse effects could cause a multitude of issues because the reduction in fish size and quality will decrease the demand for Great Lakes' fish as a food source all over the world due to commercial fisheries being forced to adjust their harvesting methods.[112]

Some states are investing in local and regional control methods for invasive carp because the invasion would cause significant damage to commercial and recreational fisheries, boating, wildlife viewing, and land-based economies.[113] The Great Lakes states and federal government already expend considerable resources and effort to mitigate expansions by Asian carp. "It costs about $13 million annually to operate electric barriers on the Chicago Sanitary and Ship Canal near the Chicago suburb of Lockport, which keep carp from swimming up the canal, into the Chicago River and on to Lake Michigan."[114] The costs of

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[109] *Socio Economic Impact of the Presence of Asian Carp in the Great Lakes Basin*, Asian Carp Can., https://www.asiancarp.ca/impacts/risk-assessments/socio-economic-impact-of-the-presence-of-asian-carp-in-the-great-lakes-basin/ (last visited Jan. 11, 2025).

[110] *The Great Lakes Fishery: A World-Class Resource!*, Great Lakes Fishery Comm'n, https://www.glfc.org/the-fishery.php (last visited Jan. 11, 2025).

[111] *Socio Economic Impact of the Presence of Asian Carp in the Great Lakes Basin*, *supra* note 109.

[112] *Id.*

[113] *Id.*

[114] Kelly House, *With New Invasive Carp Money, the Great Lakes Learns from Past Invasions*, Great Lakes Now (Mar. 14, 2022), https://www.greatlakesnow.org/2022/03/invasive-carp-money-great-lakes/.

protective infrastructure to stop the invasion of Asian carp have more than doubled in the last decade. "Before 2010,…Michigan had just $24,000 in dedicated funding for such efforts. Today, the figure is about $9 million annually, including federal dollars from the 2010 Great Lakes Restoration Initiative and a $5 million state appropriation legislators created in 2014."[115]

The Great Lakes' shipping, recreation, and fishing industries are the most powerful stakeholders surrounding the effort to address the invasive carp issue.[116] The power of these industries varies greatly in the states surrounding the Great Lakes. For example, Illinois politics strongly back the shipping industry because of its influence on the state economy.[117] Illinois possesses only sixty-nine miles of Lake Michigan's shoreline, so it does not have the same influence as Michigan and Wisconsin in decisions regarding this lake. "The Chicago Sanitary and Ship Canal accounts for seven million tons of the cargo that is shipped through Chicago each year, which adds $1.5 billion and thousands of jobs to the city's economy."[118] It has become increasingly unpopular for Illinois politicians to favor proposals that would result in the loss of transportation and shipping jobs to combat the invasion of Asian carp.[119] Michigan and Wisconsin rely heavily on the resources provided by Lake Michigan due to the states' vast Lake Michigan shorelines.[120] "The region's fishing industry is estimated to account for $7.09 billion to the local economy. The recreation industry in Michigan alone is estimated at $16.3 billion."[121]

Because of complex economic and ecological systems, changes resulting from species invasions are difficult to assess.[122] The data and models required to make these assessments are not readily available, and complete assessments would be costly and likely require years of research.[123] Existing information related to Asian carp movement and population increases in the Mississippi Basin, as well as the magnitude of recreational activities in the Great Lakes, indicate that a major threat exists, and the effects on the environment and economy are likely to be significant.[124]

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[115] *Id.*

[116] *Id.*

[117] Thomas Just, *The Political and Economic Implications of the Asian Carp Invasion*, 4 Pepp. Pol'y Rev. 5, 7 (2011).

[118] *Id.*

[119] *Id.*

[120] *Id.*

[121] *Id.* at 8.

[122] *See* Just, *supra* note 117, at 6-7.

[123] *Id.*

[124] *Id.*

V. Invasive Carp Control Methods

There are different methods for controlling invasive carp. Among the most popular methods are the use of carbon dioxide in water as a deterrent, microparticles incorporating Antimycin A, and underwater acoustic deterrents.[125] United States Geological Service (USGS) researchers have demonstrated that carbon dioxide is an effective non-selective deterrent and toxicant for many fish species.[126] "USGS designed carbon dioxide infusion systems and delivery manifolds that could be installed in navigational locks and plans to conduct a navigational lock chamber-scale engineering assessment to determine infusion efficiency and evaluate operational conditions associated with operating a carbon dioxide deterrent."[127] USGS is also working with the United States Environmental Protection Agency (USEPA) to register carbon dioxide as a deterrent to fish movement in an effort to hinder the spread of invasive carp.[128]

It is common that incorporated microparticles contain Antimycin A, which is an antibiotic substance that is known to be one of the most potent inhibitors of the mitochondrial respiratory chain and is commonly used as a general piscicide.[129] A piscicide is a chemical substance that is poisonous to fish. Antimycin A also maximizes toxicity to targeted species while minimizing exposure to native fish. In Indiana, a field trial was conducted by the USGS in the Wabash River, where primarily silver carp were killed, along with some native species not intended to be targeted.[130] For the most part, Antimycin A is successful in only killing target fish, but it is not uncommon for it to kill some non-target fish as well. The issue with Antimycin A is that it can present safety risks to humans. Because of this, Antimycin A "is classified as a Restricted Use Pesticide (RUP) due to aquatic toxicity and the need for highly specialized applicator training."[131]

In recent years, the USEPA has reregistered Antimycin A as a hazardous substance due to an ecological risk assessment to support the reregistration eligibility decision.[132] It concluded that the ecological

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[125] Mark Gaikowski, *Protecting Our Waterways: Examining Federal Efforts to Control Asian Carp in Kentucky*, U.S. Dept. of Interior (July 27, 2018), https://www.doi.gov/ocl/asian-carp-control.

[126] *Id.*

[127] *Id.*

[128] *Id.*

[129] *Id.*

[130] *Id.*

[131] *Reregistration Eligibility Decision for Antimycin A*, EPA 8 (May 2007), https://archive.epa.gov/pesticides/reregistration/web/pdf/antimycin-a.pdf.

[132] *Id.* at 24.

risk estimates exceed the Office of Pesticide Program's (OPP) level of concern.[133] In aquaculture, "Antimycin A can be applied at concentrations up to [twenty-five] ppb to achieve a 'complete kill' or at concentrations up to [ten] ppb to achieve a 'selective kill.'"[134] Complete kills are performed prior to stocking fingerlings to eliminate all fish in the treatment area.[135] "Selective kills are performed after stocking fingerlings to eliminate only more sensitive species that compete for food and resources and may reduce the yields of commercial farmers."[136]

Underwater acoustic deterrents and herding are also common methods for controlling invasive carp. The purpose of these sounds is to deter or "herd" carp away to minimize the carp's impact on native fish.[137] However, the issue with this method is that the acoustics sometimes deter native fish as well. Although the acoustics do not directly harm native fish, they cause indirect harm by driving native fish away from their natural habitats.[138] Another interesting method for the control of invasive carp is releasing carp that are YY-males.[139] "YY-males are fish that have [two] male chromosomes compared to a XY-male. When YY-males mate, they only produce male (XY) offspring. This decreases the female proportion of the population and can, in theory, eradicate local populations by biasing the sex-ratio."[140] When researchers used only the YY-male control method, they found that high levels of YY-males would need to be released annually to control the species.[141] For example, "1,000 YY-males needed to be released annually for [twenty] years to control a baseline adult population of 2,500 grass carp."[142] It seems to be counterintuitive to release more carp when there is already an invasive carp problem, but it is an interesting concept to attempt to eventually make the majority of the population sterile. For the aforementioned reasons, there are numerous options to control and maintain the population of invasive carp to a minimum, but not all of them are reaping benefits.

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[133] *Id.*

[134] *Id.* at 9.

[135] *Id.*

[136] *Id.*

[137] Gaikowski, *supra* note 125.

[138] *Id.*

[139] Richard A. Erickson et. al., *An Integral Projection Model with YY-Males and Application to Evaluating Grass Carp Control*, 361 Ecological Modelling 14, 14 (2017).

[140] *Id.*

[141] *Id.*

[142] *Id.*

VI. Policy Recommendations

Most state officials would rather spend their states' resources on preventing carp from further spreading than on managing the populations that have already been established.[143] Preventative methods are effective because of the previously discussed survivability and hardiness of Asian carp, and because it would be logical to stop something before it starts. Although this seems like a great idea in theory, it tends to be a continued losing battle. Since carp are highly adaptable and mobile between aquatic environments, and have substantially invaded United States waterways, preventative measures alone will not solve the problem. Preventative measures are important and needed, but this situation requires additional methods to assist the preventative measures.

A potential solution to the invasive carp problem is to harvest these fish for human consumption. One study analyzed the results of the first national survey on the attitudes of United States fish consumers. According to this survey, most respondents were willing to pay to try Asian carp.[144] Although the response from this survey looks promising, the largest challenge associated with harvesting Asian carp for human consumption is overcoming American consumers' negative perception of Asian carp as a food product. A common misconception is that bighead and silver carp taste like common and grass carp.[145] "[S]ilver and bighead carp have a much lighter, more delicate flavor than grass or common carp," which is why "silver and bighead carp are the most cultured fish in the world by weight."[146] Bighead and silver carp are filter feeders, eating mostly zooplankton and phytoplankton.[147] Common and grass carp are bottom feeders, giving them a distinct taste differently compared to most popular fish in the fishing industries.[148] Harvesting invasive carp for human consumption could help solve the environmental problem of the species' overpopulation. Additionally, carp would likely be harvested locally in many regions, as the species is vast throughout the country. This could serve as a strong marketing strategy for consumers who prefer local food. "Local production coupled with the fact that consuming carp is actually helping solve an environmental problem may make carp products more attractive."[149]

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[143] *Id.*

[144] Sarah Varble & Silvia Secchi, *Human Consumption as an Invasive Species Management Strategy. A Preliminary Assessment of the Marketing Potential of Asian Carp in the US*, 65 Appetite 58, 61 (2013), https://www.sciencedirect.com/science/article/pii/S0195666313000512?casa_token=7VlFeQvaU38AAAAA:aHptP497wZXpeOta_kfeJzvCi3Ijd1kzz3Kv2j4DLvUpEvfF28sNKLKIYrpn9t89phvctP5pFxA.

[145] *Id.*

[146] *Id.*

[147] *Id.*

[148] *Id.*

[149] *Id.*

Some state officials are promoting fishing to reduce the carp population in their areas. For example, the Illinois Department of Natural Resources (DNR) renamed invasive carp "copi" to make the fish sound more enticing.[150] A movement called "The Choose Copi Campaign" encourages restaurants to add carp to their menus to minimize the population of invasive carp in the state's waterways.[151] Carp have been a delicacy in Asian countries for centuries and are relatively low in water contaminants compared to other fish, and are high in protein.[152] Other midwestern states have adopted Illinois' strategy by permitting restaurant owners to add "copi" to their menus in a variety of dishes, including dips, burgers, fillets, and tacos.[153] Per the *State Journal Register*, the Assistant Chief of Fisheries for the Illinois DNR, Kevin Irons, stated that copi is "so mild, it's not fishy at all," and "[y]ou can flavor it up like a taco meat and it will taste like taco meat. It doesn't get in the way of any of those flavors. It's so flexible in how you use it when processed correctly. It won't even taste like fish."[154] There are even cookbooks specifically for "copi" recipes.[155] Also, the "Redneck Fishing Tournament in Bath, Illinois, hosts hundreds of anglers for three days and encourages them to catch as many jumping silver carp as possible."[156] "Anglers boat through the Illinois River and try to catch flying carp out of the air. [In 2022], the winning team caught 346 fish, and the tournament brought in 20,000 pounds of carp."[157]

The invasion of carp has become so pervasive that many state officials have adopted a bounty system for invasive carp. The Illinois Department of Natural Resources has a program for a black carp bounty. Under this program, which is funded by the DNR and administered by Southern Illinois University, if a person captures a black carp, they could be eligible for a $100 bounty per carcass.[158] The program has traditionally been for Illinois and adjoining states and has provided many black carp captures .[159] The first step after a person catches a black carp is to keep it, note its location, note the type of gear used to catch it, and note the habitat conditions it was found in.[160] The

[150] Carolyn Hagler, *Seven Wild Ways Scientists are Trying to Stop Invasive Carp*, Smithsonian Mag. (May 9, 2023), https://www.smithsonianmag.com/science-nature/seven-wild-ways-scientists-are-trying-to-stop-invasive-carp-180982101/.

[151] *Id.*

[152] *Id.*

[153] *Id.*

[154] *Id.*

[155] *Id.*

[156] *Id.*

[157] *Id.*

[158] *Keep, Cool, Call: What to Do if You Capture a Black Carp*, Asian Carp Reg'l Coordinating Comm. (2017), https://fw.ky.gov/Fish/Documents/KeepCoolCall.pdf.

[159] *Id.*

[160] *Id.*

second step requires the captor to "humanely" kill the fish, because live possession of black carp is illegal, and then to cool it on ice.[161] The third step requires the captor to call the local natural resource agency to plan for transport of the carp carcass.[162]

This same method is used in areas surrounding the Mississippi River; however, this program is only for black carp—bighead and grass carp are not included.[163] Depending on where black carp are caught, the captor could be entitled to reimbursement.[164] "Starting in 2021, black carp caught in watersheds upstream of Cairo, [Illinois], including all of Illinois' waters and the Missouri, Ohio, Tennessee, Cumberland and Mississippi rivers, may qualify."[165] Reimbursements to the captors are limited to catching ten black carp per person, per month, and these rewards are subject to funding availability.[166]

Some states have even appealed to the public for ideas to mitigate the negative effects of invasive carp. In January 2017, Governor Rick Snyder of Michigan made an announcement calling the "brightest minds in our country to come together with innovative ideas" on how to stop invasive carp from further infiltrating the Chicago waterway system.[167] At the time, Michigan offered a $1 million prize purse to anyone who came up with new and innovative ideas to address the issue.[168] The prize money would be awarded for a single idea or shared among several innovators.[169] A portion of the prize money was to be given to the winner or winners, while the rest would be used to support the idea.[170] Michigan also contracted with a crowdsourcing firm, InnoCentive, that awards cash for solving complex issues involving engineering and science.[171] The plan was that InnoCentive would administer the contest, judge the submissions, and award the prizes.[172] The contest went live in the summer of 2017.[173]

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[161] *Id.*

[162] *Id.*

[163] *Id.*

[164] *Id.*

[165] Aaron Mudd, *This Invasive Fish Threatens KY's Freshwater Mussels. Reel in a Reward by Catching One*, Lexington Herald-Leader (July 29, 2023), https://www.kentucky.com/news/state/kentucky/article277385443.html.

[166] *Id.*

[167] Garret Ellison, *Michigan Offers $1M to Best Ideas for Stopping Asian Carp*, MLive (Mar. 8, 2017), https://www.mlive.com/news/2017/03/michigan_asian_carp_challenge.html.

[168] *Id.*

[169] *Id.*

[170] *Id.*

[171] *Id.*

[172] *Id.*

[173] *Id.*

"The challenge drew 353 entries from [twenty-seven] nations."[174] "A proposal to repel Asian carp with stinging, noisy bubbles won first prize in a contest sponsored by the [S]tate of Michigan to find new ideas for keeping the invasive fish out of the Great Lakes."[175] Edem Tsikata, a software consultant in Boston, was the first-place winner and was awarded $200,000.[176] Three other contestants also received cash awards.[177] Tsikata's idea was to install specific "underwater propellers to generate a wall of bubbles that would implode as they move into high-pressure areas, emitting high-speed water jets. The noise of the propellers should be enough to deter the carp, but those that continue forward would experience a powerful stinging sensation as the bubbles burst."[178] Tsikata estimated that this system would cost less than $2 million, but the administrative costs have not been "fully fleshed out."[179]

Although many of these methods appear promising, it will require considerable action to combat invasive carp. These methods alone would not eradicate the species, but they are options to help reduce the population. The following list contains additional methods for controlling and deterring invasive carp:

- Water that is super-oxygenated;
- Nanoparticles filled with fish poison;
- Deploying curtains of bubbles or noise to drive them away;
- Firing jolts of electricity using a backpack-mounted "ray gun";
- Dispelling Asian carp with water guns;
- Using pheromones to drive the fish away or attract them to areas where they can be easily killed;
- Developing "biobullets" with tiny, calibrated doses of poison to kill only them; and
- Altering Asian carp eggs so that their offspring are sterile.[180]

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[174] The Canadian Press, *Michigan Crowns Winner in Contest to Prevent Asian Carp Invasion in Great Lakes*, Canadian Broad. Corp. (Mar. 28, 2018), https://www.cbc.ca/news/canada/windsor/michigan-asian-carp-competition-winner-1.4596430.

[175] *Id.*

[176] *Id.*

[177] *Id.*

[178] *Id.*

[179] *Id.*

[180] Daniel Kelly, *Asian Carp Control Methods*, Lake Scientist (Nov. 5, 2015), https://www.lakescientist.com/asian-carp-control-methods/.

Preventative control methods such as releasing sterilized fish and providing different types of barriers are necessary. Corrective control methods such as government incentives for fishing invasive carp and enticing the public to use carp for human consumption are needed to decrease the population and effects of invasive carp. Anticipatory legislation and corrective legislation are also needed to combat this issue. No single method or policy will stop the effects of invasive carp; a combination of approaches is required to successfully address the issue.

Conclusion

Our policies on controlling Asian carp populations must be more forward-looking, and the implementation of methods to prevent and mitigate further spread of Asian carp must be prioritized. Preventing a problem at the outset is always wiser and more effective than managing its consequences later. However, innovations for dealing with the existing problem can and do play an important role. The idea of incentivizing the public and research to confront the problem are both necessary, and can contribute to solutions for tackling the problem.

In our culture, money is the greatest motivator. Considering that the 2023 Great Lakes sport and commercial fisheries industry is valued at $7 billion, the incentive is substantial for confronting the carp problem.[181] Also, it is estimated that $7.09 billion is contributed to Lake Michigan's local economy through the fishing industry.[182] Michigan's recreation industry alone is estimated at $16.3 billion.[183] When the environmental impact of Asian carp can be measured in terms of the direct economic impact, more big players may get on board for confronting the problem.

It may seem like a tall task to implement all actions and methods discussed in this Article, and the truth is, it is. This is a tremendously large issue to correct due to many years of invasion by Asian carp in the United States. Since carp have an immense ability to adapt and travel to most aquatic environments and have substantially invaded U.S. waterways, preventative measures alone will not solve the problem. Additional corrective methods are needed to aid the preventative methods, with legislation aimed at combating invasive Asian carp. If there were more anticipatory actions within legislation, along with corrective actions to aid them, the environmental and economic effects of invasive carp on the United States would diminish greatly. All these methods and ideas to control Asian carp are necessary, but what is needed most is swift action.

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[181] *The Great Lakes Fishery*, *supra* note 110.

[182] Just, *supra* note 117.

[183] *Id.* at 8.

Embracing Active and Cooperative Management of Invasive Species Under The Wilderness Act

Andrea Messing*

Introduction

In 1964, the United States made a profound commitment to the environment through the Wilderness Act ("The Act").[1] A response to escalating threats posed by rapid industrialization and urbanization, The Act was designed to safeguard pristine wilderness areas, those untouched by human interference, and ensure that they remain untrammeled by human development while providing solace and inspiration to present and future generations.[2] While The Act has undeniably played a crucial role in safeguarding these pristine areas, its stringent protections have, over time, presented challenges in actively addressing rampant invasive species.[3] Globalization has inadvertently facilitated the spread of invasive species through the movement of goods and people across borders.[4] This poses a challenge to The Act's stringent protections, originally designed to preserve untouched landscapes, as invasive species exploit the interconnectedness of the modern world, threatening pristine wilderness areas.[5] The Act's emphasis on maintaining wilderness areas in their natural state, free from human intervention, creates tension between The Act's current interpretation of a "hands-off" wilderness management policy and an urgent need for adaptive management strategies to combat invasive species encroachment.[6]

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[1] *The Wilderness Act*, The Wilderness Soc'y, https://www.wilderness.org/articles/article/wilderness-act (last visited Nov. 14, 2023); *see also* 15 U.S.C. §§ 1131-1136.

[2] *Id.*

[3] Elisabeth Long & Eric Biber, *The Wilderness Act and Climate Change Adaptation*, 44 Env't L. 623, 639-41 (2014).

[4] Laura A. Meyerson & Harold A. Mooney, *Invasive Alien Species in an Era of Globalization*, 5 Frontiers Ecology & Env't 4, 199-208 (2007).

[5] *Id.*

[6] Long & Biber, *supra* note 3, at 623.

The United States' ever-changing environmental landscape demands a reevaluation of the Wilderness Act's "hands-off" philosophy. It demands a more nuanced and flexible approach to wilderness management—one that acknowledges the need for selective, careful, and cooperative intervention among federal and state agencies to protect and enhance the resilience of America's diverse ecosystems while also respecting the core values of wilderness preservation. Part I of this Note explores the historical context of the Wilderness Act of 1964. The second Part of this Note discusses the challenges of the current framework of the Wilderness Act for addressing rampant invasive species, which was originally not anticipated, and reviews successes of collaborative management in addressing these issues. Part III discusses the varying approaches to management. Finally, the fourth Part argues that a reevaluation of The Act is not an assault on the core principles of wilderness preservation, but rather, a necessary adaptation to a changing world.

I. Historical Context and Current Challenges Facing the Wilderness Act

The Wilderness Act of 1964 emerged against the backdrop of a rapidly changing American landscape.[7] As the nation underwent profound transformations driven by industrialization, urbanization, and increased demand for natural resources, concerns about the irreversible impact on pristine wilderness areas began to resonate.[8] The drafters of The Act recognized the urgent need to establish a comprehensive legal framework that would secure the protection of unspoiled landscapes for future generations.[9] The Act allows for the preservation of diverse landscapes, including forests, deserts, mountains, and other undeveloped regions, and ensures they remain unaffected by human activities.[10] Specific areas protected under the Wilderness Act include national parks, wildlife refuges, and other federal lands where the primary emphasis is on preserving wilderness character and providing opportunities for solitude and recreation in a natural setting.[11] The Act, signed into law by President Lyndon B. Johnson on September 3, 1964, was groundbreaking in its intent to preserve large tracts of federally-owned land unaltered by human encroachment.[12]

[7] *National Parks and the 1964 Wilderness Act*, Give Earth a Chance: Env't Activism in Mich., https://michiganintheworld.history.lsa.umich.edu/environmentalism/exhibits/show/main_exhibit/origins/wilderness-act (last visited Nov. 13, 2023).

[8] *Id.*

[9] *Id.*

[10] *Id.*

[11] *Id.*

[12] *Id.*

The Act represented a departure from conventional conservation approaches, which typically permitted multiple uses of public lands.[13] Instead, it marked a commitment to safeguarding certain areas from mechanized development, ensuring they remain "untrammeled by man."[14] The legislators of The Act sought to strike a balance between protecting wilderness values and allowing for an enduring, unspoiled experience of the natural world.[15] In this pursuit, the legislation established the National Wilderness Preservation System ("NWPS"), which designated specific areas as wilderness with stringent criteria for their inclusion.[16] Key principles of the NWPS include maintaining the "wilderness character" of the designated areas, which involves preserving their natural conditions, ecosystems, and the untrammeled experience of visitors.[17] Activities within wilderness areas are generally limited to those that do not significantly impact the environment, such as hiking, camping, and non-motorized recreation.[18]

Central to the original goals of the Wilderness Act was the recognition that wilderness areas held intrinsic value beyond their utilitarian worth.[19] The Act articulated the importance of providing opportunities for solitude and primitive recreation while preserving the integrity of ecosystems.[20] The creators of The Act viewed wilderness as a source of inspiration and a refuge from the increasingly mechanized and urbanized society, which reflected a belief in the moral and spiritual necessity of maintaining areas where nature could exist undisturbed.[21]

A. Current Challenges with Invasive Species

What the creators of The Act did not envision was the various challenges that would confront the preservation of wilderness areas, with one of the most prominent being invasive species.[22] Since the early

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[13] Christopher Solomon, *Rethinking the Wild*, N.Y. Times (Jul. 5, 2014), https://www.nytimes.com/2014/07/06/opinion/sunday/the-wilderness-act-is-facing-a-midlife-crisis.html.

[14] *The Wilderness Story*, U.S. Forest Serv., https://www.fs.usda.gov/managing-land/wilderness/wilderness-stories (last visited Nov. 13, 2023).

[15] *Id.*

[16] *Id.*

[17] *General Overview of Wilderness Stewardship Policy*, U.S. Fish & Wildlife Serv. (July 27, 2010), https://www.fws.gov/policy-library/610fw1.

[18] *Id.*

[19] *See generally The Wilderness Act*, *supra* note 1.

[20] *Id.*

[21] *Id.*

[22] *See generally* Douglas J. Tempel et. al., *The Status and Management of Exotic and Invasive Species in National Wildlife Refuge Wilderness Areas*, 24 Nat. Areas J. 300 (2004).

1960s, the amount of invasive species introduced to the United States has dramatically increased, and this amount will likely continue to grow in future decades.[23] Invasive species infiltrate wilderness areas through human activities such as hiking, camping, and tourism, with seeds or organisms hitchhiking on clothing, gear, and vehicles.[24] Motorized vehicles and equipment used in outdoor activities can transport invasive species over large distances, while domestic animals, like livestock and pets, may carry seeds or organisms into these pristine environments.[25] Other human activities unrelated to outdoor recreation can cause the spread of invasive species, such as releasing nonnative pets, landscaping with nonnative plants, and transporting goods internationally.[26] Commercial activities near wilderness areas, including logging and mining, can also inadvertently introduce invasive species through machinery and equipment.[27] Ballast water from ships, and natural dispersal through wind, water currents, and wildlife contribute to the spread of invasive species.[28] Climate change can also alter conditions, enabling invasive species to expand and thrive in new environments.[29]

Invasive species can cause irreparable damage to natural areas, disrupting ecological balances and outcompeting native species for resources.[30] One example of an invasive species that has invaded wilderness areas in the United States is the cheatgrass.[31] Cheatgrass is native to Europe and Asia but has become a significant invasive plant in many arid and semi-arid regions of the Western United States.[32] This grass species often outcompetes native vegetation, forming dense monocultures that are highly flammable.[33] Cheatgrass invasion has had detrimental effects on ecosystems, leading to increased fire frequency and negatively altering habitat conditions for native plant and animal species in wilderness areas such as those in the Great Basin.[34] The

[23] Mary Ellen Dix et. al., *Invasive Species and Disturbances: Current and Future Roles of Forest Service Research and Development*, *in* A Dynamic Invasive Species Research Vision: Opportunities and Priorities 91, 97 (Mary Ellen Dix & Kerry Britton eds., 2009).

[24] *See id.*

[25] *Id.*

[26] *Id.*

[27] *See id.*

[28] *Id.* at 91, 97.

[29] *Id.* at 96.

[30] *Id.*

[31] *Cheatgrass*, Utah State Univ.: Range Plants of Utah Extension, https://extension.usu.edu/rangeplants/grasses-and-grasslikes/cheatgrass (last visited Jan. 15, 2024).

[32] *Cheatgrass (Bromus tectorum)*, Midwest Invasive Species Info. Network, https://www.misin.msu.edu/facts/detail/?project=NA&id=247&cname=Cheatgrass (last visited Feb. 8, 2025).

[33] *Id.*

[34] *Id.*

spread of cheatgrass highlights the challenges invasive species pose to the preservation of natural ecosystems and the ecological balance within wilderness areas.

In response to the escalating threat of invasive species, different management strategies can be used to mitigate their impact and protect the ecosystems that are vulnerable to the resulting damage.[35] Biological control methods, such as the introduction of natural predators or pathogens specific to invasive species, are employed with caution to curtail their populations.[36]

Mechanical and chemical control methods are also used, involving manual removal, habitat modification, or targeted pesticide application.[37] Additionally, restoration efforts in affected areas focus on rehabilitating native habitats and enhancing the resilience of ecosystems to resist further invasion.[38] Collaborative efforts between government agencies, researchers, and local communities play a pivotal role in developing and implementing these management strategies, emphasizing the importance of a multifaceted and adaptive approach to combat the pervasive challenges posed by invasive species in wilderness areas.[39]

B. Departure from Traditional Wilderness Values

The traditional wilderness values embedded into The Act—those that embrace non-intervention for the preservation of wilderness areas, emphasizing solitude, primitive recreation, ecological integrity, and permanent protection for future generations—though still necessary, are different in application today. Our understanding of ecology, conservation, and the dynamic interactions of organisms within ecosystems has evolved since The Act was drafted. With the recognition of threats of invasive species, climate change, and dramatic increases in wilderness area visitation, a departure from traditional wilderness values has become apparent. This shift challenges the Wilderness Act's language, rendering it less applicable to today's nuanced understanding of nature.

Contemporary ecological science recognizes the importance of active management strategies, adaptive approaches, and community involvement in conservation efforts.[40] The traditional wilderness values

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[35] *See generally* Steven Manning & James Miller, *Manual, Mechanical, and Cultural Control Methods and Tools*, *in* Invasive Plant Management Issues and Challenges in the United States: 2011 Overview 231 (Randy Westbrooks et al. eds., Am. Chem. Soc'y 2011).

[36] *Id.* at 242.

[37] *See generally id.*

[38] *Id.*

[39] *Id.*

[40] Andrew N. Gray, *Adaptive Ecosystem Management in the Pacific Northwest: A Case Study from Coastal Oregon*, 4(2) Ecology & Soc'y 6 (Nov. 23, 2000), https://ecologyandsociety.org/vol4/iss2/art6/.

embedded in The Act do not fully align with the current understanding that acknowledges the role of humans as integral parts of ecosystems.[41] Today, conservation practices emphasize the need for collaborative and adaptive management, which contrasts with The Act's original intent of keeping wilderness areas untouched by human influence.[42]

Furthermore, the departure from traditional wilderness values is evident in society's recognition of the dynamic nature of ecosystems, including invasive species and the impacts of climate change.[43] The Wilderness Act's language may not adequately address the need for flexible management approaches to respond to changing ecological conditions.[44] A contemporary understanding of nature involves acknowledging that conservation efforts must adapt to evolving circumstances, including the ever-changing impacts of climate change and the interconnectedness of ecosystems.[45] Thus, a reevaluation of The Act's language becomes crucial to align it with the current ethos of ecological stewardship and sustainable conservation practices.

II. A Critical Look at the Language of the Act

The definition of wilderness within The Act contrasts wilderness areas against "those areas where man and his works dominate the landscape."[46] The Act states that in wilderness, "man himself is a visitor who does not remain."[47] A wilderness area is an "undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions."[48] Wilderness is also described as an area where "the imprint of man's work [is] substantially unnoticeable."[49]

The language used to define wilderness within The Act, emphasizing the absence of human influence and the preservation of primeval conditions, poses several challenges in contemporary contexts.[50] The language perpetuates a human-centric view of wilderness, framing humans as separate from and intruding upon nature rather than as integral

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[41] Mark Fincher, *Humans Apart from Nature? Wilderness Experience and the Wilderness Act*, *in* Wilderness Visitor Experiences: Progress in Research and Management 156 (David N. Cole ed., U.S. Dep't of Agric., Forest Serv., Rocky Mountain Research Station, Proc. RMRS-P-66, 2012).

[42] *Id.*

[43] *Id.*

[44] Long & Biber, *supra* note 3, at 623.

[45] *Id.*

[46] *The Wilderness Act*, *supra* note 1.

[47] *Id.*

[48] *Id.*

[49] *Id.*

[50] *See generally* Julie Lurman Joly, *Climate Adaptation Strategies are Limited by Outdated Legal Interpretations*, 30 George Wright F. 45, 48 (2013).

parts of ecosystems.[51] Today, it is increasingly evident that humans have a significant impact on virtually all ecosystems, even those designated as wilderness areas.[52] Climate change, invasive species, pollution, and other human-induced disturbances transcend wilderness boundaries, challenging the notion of untouched primeval landscapes.[53]

The strict preservationist approach outlined in The Act's language may hinder adaptive management strategies necessary to address contemporary ecological challenges.[54] Wilderness areas require active management to mitigate the impacts of invasive species, wildfires, habitat fragmentation, and other threats.[55] Human intervention is often essential for restoring ecosystems, controlling invasive species, and promoting biodiversity in wilderness areas.[56]

Recognizing the role of humans as stewards of wilderness areas is crucial for effective conservation and management. Engaging local communities, scientists, and stakeholders in wilderness management efforts can foster collaboration and innovation in addressing ecological challenges. By embracing a more dynamic and inclusive approach to wilderness conservation, we can ensure the long-term sustainability and resilience of wilderness areas in the face of ongoing environmental changes.

While the language of The Act reflects historical perspectives and conservation values prevalent at the time of its drafting, it fails to account for the complexities of contemporary conservation challenges, diverse cultural perspectives, and the interconnectedness of human and natural systems. Updating the language and principles of The Act to better align with modern ecological understanding is essential for fostering more inclusive and effective approaches to wilderness conservation and management.

A. Defining Wilderness Management

Wilderness management refers to the comprehensive and deliberate approach taken to oversee, preserve, and sustainably utilize wilderness areas.[57] The primary objective of wilderness management is to maintain the natural integrity of these landscapes while safeguarding their ecological health, biodiversity, and cultural significance.[58] It

[51] *Id.*
[52] *Id.*
[53] *Id.* at 46, 48.
[54] *Id.* at 48.
[55] *Id.* at 47.
[56] *Id.* at 47-48.
[57] *See generally* Robert Lucas, *Wilderness: A Management Framework*, 28 J. Soil & Water Conservation 150, 151-52 (1973).
[58] *Id.* at 150-51.

involves a range of practices, policies, and strategies aimed at conserving wilderness values, protecting natural resources, regulating visitor use and recreation, restoring degraded ecosystems, fostering collaboration among stakeholders, and adhering to legal frameworks and management plans.[59] Wilderness management requires careful planning, ongoing monitoring, and adaptive decision-making to balance conservation objectives with the needs of present and future generations, ensuring that these wild and pristine areas remain intact for posterity.[60]

A key aspect of wilderness management is maintaining, not altering, ecosystems.[61] It is imperative for wilderness managers not to seek productivity from an ecosystem but rather to prioritize its ecological health, resilience, and intrinsic value.[62] Wilderness managers must not lose sight of the inherent complexity and interconnectedness of wilderness ecosystems in their pursuit of other objectives.[63] While it may be tempting to prioritize certain human-centric goals like increased visitation, economic development, or resource extraction, wilderness managers must resist the urge to prioritize these over the fundamental principles of ecological conservation and preservation.[64] Straying from the core mission of protecting wilderness areas can have far-reaching consequences, including habitat fragmentation, loss of biodiversity, and degradation of ecosystem services.[65] Therefore, wilderness managers must remain steadfast in their commitment to upholding the natural integrity and wilderness values of these areas, recognizing that their primary responsibility is to safeguard the ecological health and resilience of wilderness ecosystems for the benefit of present and future generations.

III. Conflicting Approaches to Invasive Species Management Under the Wilderness Act

The phrase "preservation of wilderness character" within the context of The Act refers to the overarching objective of safeguarding the unique and natural qualities that define designated wilderness areas.[66] This commitment to preserving wilderness character encompasses principles like maintaining natural conditions, allowing landscapes to evolve without anthropogenic interference, ensuring areas are

[59] *Id.* at 151-54.
[60] *Id.*
[61] *Id.* at 151.
[62] *Id.*
[63] *Id.*
[64] *Id.*
[65] *Id.*
[66] *The Wilderness Act*, *supra* note 1.

unaffected by human control, and providing outstanding opportunities for solitude and primitive recreation.[67] Additionally, the concept involves safeguarding ecological integrity, protecting biodiversity, and preserving the aesthetic values of the wilderness.[68] The Act requires the preservation of wilderness character but lacks specific guidance on tackling invasive species that threaten to decimate it, leaving the methodology of managing invasive species open to interpretation.[69]

The variability in interpreting "preservation of wilderness character" leads to the following dichotomy: Some individuals argue that active management, which involves interventions such as habitat restoration, controlled burns, and population monitoring, is essential for wildlife preservation.[70] Others advocate for a hands-off approach and maintain that the best way to preserve wildlife is to leave it entirely untouched by man.[71] For example, wilderness advocates may prioritize the "untrammeled" mandate above all else, viewing any form of wilderness manipulation as inappropriate. Conversely, natural resource specialists may argue that refraining from restoration action jeopardizes the ecological integrity of wilderness.[72] This divergence in perspectives highlights the complexities surrounding The Act's implementation and underscores the need for a nuanced approach to address the challenges posed by non-native species within designated wilderness areas. This Part examines two approaches regarding species introduced to wilderness areas that do not belong, one being "hands-off," and the other being "active."

A. Hands-Off Approach

A hands-off approach to wilderness management, often referred to as "non-intervention" or "minimum-impact" management, is a philosophy that advocates for minimal human interference in natural ecosystems.[73] This approach is grounded in the belief that certain wilderness areas should be left to evolve and function without human

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[67] *Id.*

[68] *Id.*

[69] Peter Landres et al., *Protected Area Stewardship in the Anthropocene: Integrating Science, Law, and Ethics to Evaluate Proposals for Ecological Restoration in Wilderness*, 28 Restoration Ecology 8, 8 (2020).

[70] *Id.*

[71] *Id.*

[72] *Id.*

[73] Peter Landres, *Let It Be: A Hands-Off Approach to Preserving Wildness in Protected Areas*, *in* Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change 88-101 (David N. Cole & Laurie Yung eds., 2012).

intervention.[74] Central to this philosophy is the consideration of wilderness areas as reference ecosystems, providing insights into natural conditions unaffected by direct human activities.[75] The strategy involves limiting the development of infrastructure, such as roads and trails, to minimize the ecological footprint and uphold the wilderness character, including solitude, natural soundscapes, and primitive conditions.[76] While advocating for minimal intervention, the hands-off approach encourages scientific research and monitoring to assess ecological health and understand the impacts of natural processes.[77] Despite its merits in preserving wilderness in a natural state, debates persist regarding the balance between non-intervention and addressing potential threats or disturbances that may impact the ecological integrity of these areas.[78]

1. *Example 1:* Cumberland Island, Georgia

A notable instance of the hands-off approach to wilderness management is the neglect of managing exotic species within the Cumberland Island Wilderness Area in Georgia. In 1982, Congress designated over 9,000 acres of the northern half of the island as Wilderness Area, making it one of the largest barrier island Wilderness Areas in the United States.[79] With pristine maritime forests and sparkling beaches, the island is home to loggerhead sea turtles, alligators, pelicans, and many other species.[80] However, there is a species that roams the island that does not belong: horses.[81] The horses were introduced in the early 1900s as free-ranging livestock, but are now feral and pose various ecological problems.[82] The horses trample and graze on essential plant species, such as Spanish moss and smooth cordgrass; these floras reduce the marshland's grass density, which is crucial for sediment trapping and erosion control—without the ability to trap sediment, the island is made more vulnerable during storms.[83] Additionally, the horses feed on and deplete sea oats, a grassy resource that stabilizes coastal dunes and provides nesting sites for endangered animals.[84] The horses' presence

[74] *Id.* at 91.

[75] *Id.*

[76] *Id.*

[77] *Id.*

[78] *Id.* at 97.

[79] *What is Wilderness?*, Wild Cumberland, https://wildcumberland.org/wilderness-history/ (last visited Dec. 29, 2024).

[80] *Id.*

[81] *Feral Horses – Cumberland Island*, Nat'l Parks Serv., https://www.nps.gov/cuis/learn/nature/feral-horses.htm (June 25, 2021).

[82] *Id.*

[83] *Id.*

[84] Hal Wright & Rhett Lawrence, *Feral Animals on Cumberland Island*, Wild Cumberland (2010), https://wildcumberland.org/feral-animal-on-cumberland-island/.

physically damages delicate marshland ecosystems, disrupts the habitats of various species, and leads to the abandonment of bird nests and the destruction of shorebird eggs.[85]

The Act's primary goal is to preserve the wilderness character of designated areas, ensuring that they remain unimpaired for future generations.[86] Allowing feral horses, a non-native species, to inhabit the Cumberland Island Wilderness Area contradicts this fundamental objective and undermines the very essence of wilderness preservation as outlined in The Act.[87] To uphold The Act's core principles, it becomes imperative for the National Park Service ("NPS") to take decisive measures, such as the removal or relocation of these non-native species, to safeguard the wilderness character of the Cumberland Island Wilderness Area and fulfill its mandate for the benefit of current and future generations.[88]

2. *Example 2:* White Pine Blister Rust

Another example of a danger to unmanaged wilderness is white-pine blister rust.[89] In the highland forests of northern Idaho and Montana, whitebark pines assume the role of "keystone species," wielding important ecological functions.[90] Promptly colonizing post-fire or landslide-type landscapes, these trees offer crucial shade conducive to the propagation of adjacent flora, while concurrently mitigating snowmelt, soil erosion, and the perils of avalanches.[91] The substantial seeds of whitebark pines, resembling sizable popcorn kernels, represent a pivotal dietary staple for grizzly and black bears, with Clark's nutcrackers, assorted avifauna, and red squirrels adeptly storing these seeds for their winter sustenance reserves.[92]

The whitebark pine is in danger of the threat of white-pine blister rust. A non-native fungus, white-pine blister rust infects more than two-thirds of trees in the region.[93] "The rust kills trees, curtails seed production, and leaves forests, potentially already weakened by

[85] *Id.*

[86] Wilderness Act of 1964, Pub. L. No. 88-577, 78 Stat. 890 (1964).

[87] Kurt Repanshek, *National Park Service Sued Over Cumberland Island National Seashore's Feral Horses*, Nat'l Parks Traveler (Apr. 18, 2023), https://www.nationalparkstraveler.org/2023/04/national-park-service-sued-over-cumberland-island-national-seashores-feral-horses.

[88] *Id.*

[89] Joshua Zaffos, *A New Challenge for Wilderness: To Intervene or Not to Intervene?*, Earth Island J. (Sept. 4, 2014), https://www.earthisland.org/journal/index.php/articles/entry/a_new_challenge_for_wilderness_intervene_or_not/##.

[90] *Id.*

[91] *Id.*

[92] *Id.*

[93] *Id.*

climate change, more susceptible to fires and other insect outbreaks."[94] Without intervention, the trees will likely disappear, which would cause a reduction in food for wildlife, increase soil erosion, and negatively impact water quality and quantity.[95]

Large regions of northern Idaho and Montana are wilderness areas protected by The Act, and the protections are impeding scientists and researchers from treating the trees.[96] Scientists can breed and plant trees that are resistant to the white-pine blister rust, but wilderness managers would have to make exceptions under The Act in order to plant the trees.[97] Under the current reading of The Act, the planting of the trees would amount to "trammeling" in the wilderness—something explicitly prohibited by The Act.[98] Though scientists, researchers, and wilderness managers know planting the trees would help preserve the current wilderness, the conflict between preservation and intervention remains a central dilemma. As the urgency to protect threatened species intensifies, wilderness managers are confronted with the challenge of balancing conservation imperatives with the fundamental tenets of wilderness protection enshrined in The Act. This conundrum underscores the need for a nuanced reevaluation of wilderness management practices in the face of evolving ecological threats and conservation priorities.

B. Active Wilderness Management Approach

An active wilderness management approach represents a strategy involving deliberate human interventions to enhance, manipulate, or control wildlife populations and their habitats.[99] In contrast to a hands-off, or minimal intervention approach, active wildlife management acknowledges the role of human actions in shaping ecosystems and seeks to optimize wildlife populations for various objectives, including conservation, recreation, or economic considerations.[100] This approach often involves habitat manipulation, such as controlled burns, reforestation, or the creation of water sources, to enhance wildlife habitat and promote specific species.[101] Additionally, active wildlife management may include activities like predator control, translocations, or controlled hunting to manage population numbers

[94] *Id.*
[95] *Id.*
[96] *Id.*
[97] *Id.*
[98] *Id.*
[99] *Active Forest Management*, Cong. Sportsmen's Found., https://congressionalsportsmen.org/policy/active-forest-management/ (last visited Jan. 15, 2024).
[100] *Id.*
[101] *Id.*

and balance ecosystems.[102] Scientific monitoring and research play a crucial role in this approach, providing data to inform management decisions and assess the effectiveness of interventions.[103] While active wildlife management aims to achieve specific goals, it also raises ethical and ecological concerns, as the manipulation of ecosystems may disrupt natural processes and have unintended consequences.[104] Striking a balance between intervention and allowing natural processes is a key consideration in the ongoing debate surrounding active wildlife management.

1. *Example:* Burmese Python Management in Florida

One example of active wildlife management is the cooperation between NPS and state and local groups to control the Burmese python invasion in South Florida.[105] Many python species, originally native to Africa, Asia, and Australia, were brought to the United States to be kept as pets.[106] Whether intentionally or accidentally, one of the most favored pet snake species, the Burmese python, made its way into the South Florida wilderness.[107] Over time, the pythons established a breeding population and are now considered one of the most troubling invasive species in the Everglades National Park.[108] These stealthy predators actively compete with other native predators for a variety of prey, including mammals, birds, and even other reptiles.[109] Notably, severe declines in mammal populations in the Everglades National Park have been attributed to the presence of Burmese pythons.[110]

The NPS has been actively collaborating with partners to address the issue of Burmese pythons in South Florida.[111] Its current efforts involve creating a statewide management plan in coordination with the Florida Fish and Wildlife Commission, conducting research

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[102] *See generally Hunting as a Tool for Wildlife Management*, U.S. Dep't of the Interior (Feb. 7, 2023), https://www.fws.gov/story/hunting-tool-wildlife-management.

[103] *Id.*

[104] *Id.*

[105] *Everglades National Park and FWC to Expand Python Removal Efforts*, U.S. Dep't of the Interior (Jan. 10, 2024), https://www.nps.gov/ever/learn/news/everglades-national-park-and-fwc-to-expand-python-removal-efforts.htm.

[106] *Pythons*, U.S. Geological Surv., https://www.usgs.gov/centers/wetland-and-aquatic-research-center/science/science-topics/pythons# (last visited Nov. 6, 2023).

[107] *Id.*

[108] *Id.*

[109] *Id.*

[110] *Id.*

[111] *Burmese Pythons: Management*, Nat'l Parks Serv., https://www.nps.gov/ever/learn/nature/npspythonmanagement.htm (Jan. 10, 2021).

synthesis in partnership with the U.S. Geological Survey, and supporting a multi-year research program on python ecology, control methods, and monitoring tools.[112] The NPS is also expanding its Python Removal Authorized Agent Program in collaboration with the Florida Fish and Wildlife Commission, which will enhance python control and provide valuable data for research.[113] This collaborative approach has proven effective; as of January 2023, over 18,000 pythons have been removed from Florida.[114]

While adhering to The Act's principles of preserving natural conditions, NPS and state agencies are effectively managing Florida areas protected under The Act. This active, collaborative management approach for addressing exotic species in a wilderness area is a great example of what could be a standard practice nationwide.

C. Court Interpretation of Active Wilderness Management

In the case of *Sierra Club v. Block*, the Forest Service faced legal action for its approval of a clear-cutting initiative aimed at eradicating a pine beetle infestation causing significant damage to trees within a designated wilderness area.[115] The Sierra Club contended that the pine beetle outbreak constituted a natural occurrence and that managing against it would contravene the principles of The Act.[116] Conversely, the Forest Service asserted its obligation to mitigate substantial insect infestations in line with The Act's objectives.[117] Despite aligning with the purported goals of The Act, the court declined to grant a comprehensive injunction on all tree-cutting activities, recognizing that unchecked pine beetle infestation could result in irreparable losses surpassing those incurred by the government's cutting program.[118] However, the court restricted the Forest Service's actions to activities consistent with the agency's management directives.[119] Although the Forest Service had opted for clear-cutting in affected forest sections, the court disregarded the agency's expertise and prohibited cutting in areas not proven to be particularly vulnerable, as well as barred the cutting of certain hardwood

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[112] *Id.*

[113] *Id.*

[114] *Python Action Team Removing Invasive Constrictors*, Fla. Fish & Wildlife Conservation Comm'n, https://myfwc.com/wildlifehabitats/nonnatives/python/action-team/ (last visited Nov. 6, 2023).

[115] *See* Sierra Club v. Block, 614 F. Supp. 134, 135 (E.D. Tex. 1985).

[116] *Id.* at 136, 139.

[117] *Id.* at 136.

[118] *Id.* at 135.

[119] *Id.* at 140.

trees unaffected by the pine beetle.[120] The court relied heavily on two justifications for the tree-cutting initiative: safeguarding endangered species and preventing the spread of the beetle infestation to other wilderness areas.[121]

Sierra Club v. Block stands as a testament to the recognition of the necessity for active management guided by scientific principles, emphasizing cautious management within wilderness areas.[122] The case demonstrates the dichotomy between preservationist mandates enshrined in the Wilderness Act and the imperatives of ecological stewardship in the face of natural disturbances such as insect infestations.[123] By refusing to grant a blanket injunction on all tree-cutting efforts, the court acknowledges the potential irreparable losses posed by unchecked pine beetle infestations, which could far exceed the impacts of the government's cutting program.[124] This recognition underscores the imperative for cautious, science-based management practices aimed at preserving wilderness integrity while addressing pressing ecological challenges.[125]

Moreover, the court's scrutiny of the Forest Service's management actions underscores the importance of informed decision-making grounded in scientific expertise.[126] By limiting the agency's actions to areas proven to be particularly at risk and prohibiting cutting of unaffected hardwood trees, the court emphasizes the necessity of targeted, evidence-based interventions that minimize unintended ecological consequences.[127]

Sierra Club v. Block highlights the role of judicial oversight in ensuring that active management efforts within wilderness areas adhere to the principles of ecological integrity and preservation enshrined in the Wilderness Act. By embracing a cautious approach that prioritizes scientific rigor and environmental sensitivity, the decision underscores the need for adaptive management strategies that reconcile the imperatives of conservation with the dynamic realities of natural ecosystems.

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[120] *Id.* at 140-41.

[121] *Id.* at 141.

[122] *See generally* Liam Patton, *Reimagining What is Necessary: Using Active Management in Wilderness Areas to Mitigate High-Loss Wildfires*, 32:2 Colo. Nat. Res. Energy & Env't L. Rev. 367 (2021).

[123] *Id.* at 389.

[124] *Id.* at 391.

[125] *Id.*

[126] *Id.*

[127] *Id.* at 391.

IV. Utilizing Cautious Active Management

When approached judiciously and in accordance with The Act's overarching principles, active management of wilderness areas serves to enhance biodiversity, mitigate ecological threats, and ensure the long-term viability of wilderness areas.[128] It is imperative that active management be approached with careful consideration of scientific research, ecological assessments, and comprehensive stakeholder engagement.[129]

It is equally important to recognize that not all wilderness areas require active management.[130] Some ecosystems may be suited to survive without any manipulation, exhibiting remarkable resilience and adaptability in the face of environmental challenges.[131] Without careful consideration and mitigation practices, active management could be more detrimental than beneficial.[132] Proposed active management initiatives must be carefully evaluated on a case-by-case basis, considering the unique ecological characteristics and conservation needs of each wilderness area.[133] These wilderness areas represent invaluable reservoirs of biodiversity, where natural processes unfold in intricate harmony, undisturbed by human interference.[134]

Attempting to impose active management in such ecologically self-sustaining environments risks disrupting the delicate balance that has evolved over time.[135] Interventions, even well-intentioned ones, may inadvertently introduce novel stressors, alter species interactions, or destabilize ecosystem dynamics, ultimately compromising the very wilderness values they seek to protect.[136] In these instances, the most prudent course of action may be one of non-intervention, allowing nature to dictate its own course and preserving the integrity of these untouched landscapes.[137]

To achieve active management best suited for each wilderness area, transitioning toward the concept of cooperation with state and

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[128] *See* generally Jocelyn L. Aycrigg et al., *Wilderness Areas in a Changing Landscape: Changes in Land Use, Land Cover, and Climate*, Ecological Applications (Nov. 8, 2021), https://pmc.ncbi.nlm.nih.gov/articles/PMC9285566/.

[129] *See* Sarah A. Casson et. al., *Wilderness Protected Areas: Management Guidelines for IUCN Category 1b Protected Areas*, IUCN, https://portals.iucn.org/library/sites/library/files/documents/pag-025.pdf (Sept. 2017).

[130] *Id.*

[131] *Id.*

[132] *Id.*

[133] *Id.*

[134] *Id.*

[135] *Id.*

[136] *Id.*

[137] *Id.*

local agencies is integral to the discourse on wilderness management.[138] While the federal government oversees carrying out the mandates of The Act, collaboration with state and local authorities can enhance the effectiveness of management efforts. State and local agencies often possess invaluable insights, resources, and expertise that can complement federal initiatives.[139] By fostering partnerships between federal, state, and local stakeholders, a more holistic approach to wilderness management can be achieved.[140] Such collaboration facilitates the exchange of knowledge, promotes coordinated action, and ensures that management strategies align with the overarching goals of The Act.[141]

A. Cooperation with State and Local Agencies

Section 4(d)(7) of the Wilderness Act acknowledges the existing authority of states in managing fish and wildlife within wilderness areas.[142] It specifies that nothing in The Act shall be construed as affecting the jurisdiction or responsibilities of states for wildlife and fish in the wilderness areas.[143] Further, all federal agencies that are charged with managing wildlife in wilderness areas have published guidelines ensuring cooperative management with state authorities.[144] All of this considered, whether federal agencies actually cooperatively work with state, local, and tribal agencies is highly individualized among the agencies, and in some cases, objectives between federal and state agencies conflict.[145]

Conflicting interests between federal and state, local, and tribal agencies sometimes escalate into prolonged legal battles, which drain both time and resources that could have otherwise been directed toward conservation efforts.[146] Divergent goals between federal and state governments can result in inconsistent management practices and

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[138] *Id.*

[139] *Id.*

[140] *National Park Service: Opportunities Exist to Clarify and Strengthen Special Uses Policies and Implementing Guidance*, U.S. Gov't Accountability Off. (2008), https://www.govinfo.gov/content/pkg/GAOREPORTS-GAO-08-262/html/GAOREPORTS-GAO-08-262.htm.

[141] *Id.*

[142] Wilderness Act, 16 U.S.C. § 1133(d)(7) (2018).

[143] *Id.*

[144] *See generally The Forest Service Manual: Chapter 2320 – Wilderness Management*, U.S. Forest Serv. (Jan. 22, 2007), https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_053277.pdf; National Park Service's Management Policies 2006, Director's Order #41; Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701-1785 (1976); FWS Wilderness Policy 610 FW 1-5 (2006).

[145] *See* David Favre, *American Wildlife Law – An Introduction*, Animal L. Web Ctr. (2003), https://www.animallaw.info/article/american-wildlife-law-introduction.

[146] *Id.*

foster confusion, inefficiency, and at times, irreparable damage to the delicate balance of these wilderness areas.[147] Such disputes not only stall critical decision-making processes but also impede the implementation of essential protective measures, leaving these areas vulnerable to environmental degradation, habitat loss, and disruption of ecosystems.[148] Moreover, conflicting messages from these agencies contribute to public confusion and erode trust in the efficacy of wilderness management, something that potentially diminishes crucial public support for conservation initiatives.[149] Collaborative efforts crucial for preserving these wilderness areas and safeguarding the flora and fauna within them are hindered without coordination and consensus among these parties, and resources and expertise remain underutilized.[150]

B. ESA Cooperative Policy

Wildlife and natural resource management agencies are recognizing the growing benefits of collaborative management efforts with local officials. In 2016, the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) made significant revisions to the interagency cooperative policy under the Endangered Species Act (ESA).[151] The revisions aim to clarify the role of state agencies in ESA implementation, emphasizing cooperation with states to the maximum extent practicable.[152] Under Section 6 of the ESA, both the USFWS and the NMFS must collaborate with states in conserving the nation's imperiled species.[153] The revised policy, originally established in 1994, now seeks to underscore the importance of states in mitigating threats to species at all stages of the ESA listing process.[154]

The key points of the policy revision include a commitment to early conservation discussions between federal and state agencies, sharing of research, regulatory proposals, and impact statements.[155] The importance of state agencies in mitigating threats to species is reaffirmed,

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[147] Daniela B. Raik, *Capacity Building for Co-Management of Wildlife in North America*, Cornell Univ. (Mar. 2002), https://ecommons.cornell.edu/server/api/core/bitstreams/f77c1867-e312-44a5-b9de-ead179b61e49/content.

[148] *Id.*

[149] *Id.*

[150] *Id.*

[151] Lauren McDonald, *Agencies Revise ESA State and Federal Collaboration Policy*, The Wildlife Soc'y (Feb. 25, 2016), https://wildlife.org/agencies-revise-esa-state-and-federal-collaboration-policy/.

[152] *Id.*

[153] *Id.*

[154] *Id.*

[155] *Id.*

recognizing their valuable relationships with local landowners.[156] The revision acknowledges the role of landowner conservation programs, citing tools like Candidate Conservation Agreements with Assurances that incentivize landowners to engage in conservation activities when at-risk species are found on their land.[157]

While the ESA protects imperiled species and their habitats, the Wilderness Act similarly protects wilderness areas, many of which are home to such species.[158] Adopting a similar revision to emphasize cooperation within The Act would align with The Act's principles of promoting the preservation of wilderness character.[159] The revision boosting cooperation with states mirrors the hands-on approach to conservation, recognizing the importance of local knowledge and involvement in preserving both species and their ecosystems.[160] Therefore, a similar revision to The Act would promote a comprehensive and collaborative approach to conservation that aligns with the intended principles of The Act.

C. Cooperative Agreement Example: Montana

In June 2008, Montana Fish, Wildlife and Parks and the United States Forest Service Northern Region published a cooperative agreement for the management of wildlife in Montana National Forest's wilderness lands.[161] This agreement underscores the significance of collaboration, acknowledging the different authorities and responsibilities held by each agency while emphasizing that a cooperative approach will best benefit fish, wildlife, and habitat resources.[162] The agreement aligns with and embraces the Wilderness Act of 1964, emphasizing the preservation of wilderness character and acknowledging the role of states in wildlife management in national forests.[163] Referencing The Act's provisions that define wilderness character and mandate the preservation of its natural conditions, it outlines a shared vision between the agencies regarding the management of fish, wildlife, and habitat in Montana.[164] The agreement highlights the responsibility of each agency in preserving wilderness

[156] *Id.*

[157] *Id.*

[158] Endangered Species Act, 16 U.S.C. §§ 1531-1544 (1973).

[159] *See generally The Wilderness Act*, *supra* note 1.

[160] *See* McDonald, *supra* note 151.

[161] *See generally Cooperative Agreement for Fish, Wildlife and Habitat Management on National Forest Wilderness Lands in Montana*, Mont. Fish, Wildlife & Parks (June 2008), http://www.umt.edu/media/wilderness/toolboxes/documents/fishWildlifeMgmt/Final%20Cooperative%20Agreement%20For%20Fish%20Wildlife.pdf.

[162] *Id.*

[163] *Id.*

[164] *Id.*

character while acknowledging the State's role in managing wildlife.[165] It emphasizes the need for cooperative efforts to manage resources compatible with wilderness purposes, promoting collaborative projects and annual coordination meetings between the agencies at local and regional levels.[166]

D. Utilizing Cooperative Agreements in Coordination with the Wilderness Act

The ongoing Burmese python removal project in Florida serves as a compelling example of the effectiveness of collaboration between federal and state agencies in wildlife management, particularly in combating invasive species. This collaborative effort embodies the marriage of an active approach to invasive species management with the pooling of resources and expertise across governmental levels.

Collaboration between federal and state agencies holds significant promise in addressing invasive species for several reasons.[167] Firstly, federal programs often provide greater funding opportunities for state wildlife management plans, supplementing state budgets and enabling more comprehensive initiatives.[168] By leveraging federal funding, state agencies can allocate their resources more efficiently, dedicating state funds to alternative programs or addressing other wildlife management priorities.[169]

Furthermore, collaboration facilitates the alignment of efforts between state and federal agencies, allowing for the identification of common goals and strategies.[170] This alignment not only maximizes the impact of interventions but also reduces the risk of duplicating efforts or conflicting approaches.[171] By working together, agencies can develop cohesive management plans that capitalize on each other's strengths and resources.[172]

The benefits of collaboration extend beyond financial support. Federal agencies can enhance outreach efforts and foster partnerships with local governments and non-governmental organizations, tapping into a broader network of stakeholders invested in wildlife conservation. This multi-sectoral collaboration enhances the effectiveness of management strategies and promotes community engagement in conservation initiatives.

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[165] *Id.*

[166] *Id.*

[167] *See generally Overview of National Federal Interagency Coordinating Groups*, Nat'l Invasive Species Council (Aug. 19, 2021), https://www.doi.gov/sites/doi.gov/files/interagency-coordinating-group-descriptions-updated-8-19-2021.pdf.

[168] *Id.*

[169] *Id.*

[170] *Id.*

[171] *Id.*

[172] *Id.*

Moreover, collaboration ensures that decisions made by federal agencies are informed by the expertise and input of state wildlife management agencies.[173] By incorporating diverse perspectives and insights, federal policies and interventions can be tailored to address the unique challenges and priorities of local ecosystems and communities.[174]

In essence, the integrated approach facilitated by collaboration between federal and state agencies maximizes resources, aligns management goals, and fosters a more efficient and effective response to wildlife management challenges. By embracing collaboration, agencies can leverage collective expertise and resources to address complex conservation issues, such as invasive species, in a coordinated and sustainable manner.

E. Cooperation with Indigenous Tribes

It is imperative to acknowledge that The Act failed to recognize Native Americans and their traditional relationship with the land.[175] The Act overlooked the deep cultural, spiritual, and historical ties that Indigenous peoples have to the lands encompassed within designated wilderness areas.[176] Native American tribes have inhabited and stewarded these lands for thousands of years, possessing intricate knowledge of local ecosystems, wildlife behavior, and sustainable land management practices.[177] However, The Act did not explicitly acknowledge or incorporate this valuable Indigenous wisdom into wilderness management strategies, perpetuating a narrative that marginalized Indigenous voices and contributions to conservation efforts.[178]

Furthermore, the Wilderness Act failed to address the historical injustices and displacement experienced by Native American tribes because of colonization and land dispossession.[179] Many wilderness areas were established on lands that were forcibly taken from Indigenous peoples through violent encroachment, broken treaties, and policies of removal and assimilation.[180] The Act's silence on this history

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[173] *Id.*

[174] *Id.*

[175] Sarah Miranda, *The Real Meaning of Wilderness: Impacts of the Wilderness Act on Native Americans*, A.B.A. (Nov. 23, 2022), https://www.americanbar.org/groups/environment_energy_resources/resources/newsletters/indigenous/impacts-wilderness-act-native-americans/?login.

[176] *Id.*

[177] *Id.*

[178] *Id.*

[179] *Id.*

[180] Michael Shawn-Fletcher et al., *Indigenous Knowledge and the Shackles of Wilderness*, Procs. Nat'l Acad. Scis. (Sept. 27, 2021), https://www.pnas.org/doi/10.1073/pnas.2022218118.

of dispossession perpetuated a narrative of erasure and invisibility of Indigenous peoples' experiences and struggles for land and cultural preservation.

In 2021, the Secretary of the Interior passed a secretarial order establishing guidelines and directives for federal agencies to fulfill their trust responsibility to Indian Tribes in the stewardship of Federal lands and waters, promoting collaboration, consultation, and protection of Tribal interests and rights.[181] The Order directs the Departments to make decisions considering the interests of Indian Tribes, collaborate with Tribes in co-stewardship of federal lands and waters, support Tribal opportunities to consolidate homelands, conduct legal reviews, and issue reports on actions taken.[182] The Departments are directed to consider Tribal expertise and/or Indigenous knowledge as part of Federal decision-making relating to Federal lands, particularly concerning management of resources subject to reserved Tribal treaty rights and subsistence uses.[183]

The Order is designed to foster collaboration between Federal agencies and Indian Tribes, but it cannot erase the historical injustices and systemic inequalities that Indigenous peoples have endured. It cannot undo the centuries of displacement, exploitation, and marginalization experienced by Native American tribes at the hands of colonial powers and the United States government. The wounds inflicted by past policies of forced removal, assimilation, and land dispossession continue to reverberate through Indigenous communities today, shaping their relationship with the land and their struggle for cultural survival and sovereignty.

While the Order represents a step towards recognizing and honoring the rights and contributions of Indigenous peoples, true reconciliation and justice require more than administrative directives. It necessitates a comprehensive acknowledgment of past wrongs, genuine efforts to address ongoing injustices, and meaningful engagement with Indigenous communities as equal partners in decision-making processes that affect their lands, resources, and well-being.

In moving forward, it is essential for Federal agencies to actively listen to Indigenous voices, center Indigenous perspectives and priorities in land management practices, and uphold the principles of sovereignty, self-determination, and environmental justice for Native American tribes. Only through genuine collaboration, respect, and accountability can we begin to heal the wounds of the past and forge a more equitable and sustainable future for all.

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[181] *Joint Secretarial Order No.3403, Fulfilling the Trust Responsibility of Indian Tribes in the Stewardship of Federal Lands and Waters*, U.S. Dep't of the Interior (Nov. 15, 2021), https://www.doi.gov/sites/doi.gov/files/elips/documents/so-3403-joint-secretarial-order-on-fulfilling-the-trust-responsibility-to-indian-tribes-in-the-stewardship-of-federal-lands-and-waters.pdf.

[182] *Id.*

[183] *Id.*

F. Conservation Without Conflict Model

Leopoldo Miranda-Castro's guide, *Conservation without Conflict: A Persuasive Step-by-Step Guide to Achieving Collaborative Conservation*, offers a comprehensive framework for collaborative conservation practices, emphasizing the importance of voluntary engagement and shared goals among stakeholders.[184] This guide, although not prescriptive, provides a wealth of insights based on case studies and experiences, presenting a persuasive argument for adopting a more inclusive and cooperative approach to conservation efforts.[185] Published in the August 2023 edition of the Wildlife Management Institute, the guide addresses the challenges faced in traditional conservation practices, which often lead to conflicts and hinder the achievement of shared environmental goals.[186]

Miranda-Castro's model advocates for a nuanced understanding of the local context, emphasizing the need to listen to and engage with local stakeholders.[187] By exploring the unique social, economic, cultural, political, and historical factors shaping communities where conservation initiatives occur, the guide suggests that building trust and respect through genuine collaboration can lay the foundation for fruitful and conflict-free conservation.[188] This principle aligns with the broader discourse on adaptive and inclusive conservation practices, promoting a shift away from top-down approaches.[189]

The guide outlines a step-by-step approach to effective collaborative conservation, emphasizing elements such as empowering meaningful engagement, clarity of purpose around shared goals, adaptive management strategies, fostering sustainable livelihoods, building capacity, establishing collaborative governance mechanisms, and maintaining continuous communication and learning.[190] These principles, when applied to conservation initiatives, foster innovation, build trust, and ensure that approaches remain effective and relevant in evolving circumstances.[191]

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[184] Leopoldo Miranda-Castro, *Conservation Without Conflict: A Persuasive Step-by-Step Guide to Achieving Collaborative Conservation*, Wildlife Mgmt. Inst. (Aug. 15, 2023), https://wildlifemanagement.institute/outdoor-news-bulletin/august-2023/conservation-without-conflict-persuasive-step-step-guide.

[185] *Id.*

[186] *Id.*

[187] *Id.*

[188] *Id.*

[189] *Id.*

[190] *Id.*

[191] *See id.*

In the context of potential amendments to The Act, Miranda-Castro's guide provides a legal roadmap for aligning the legislation with contemporary collaborative conservation practices.[192] The Act aimed to preserve designated wilderness areas in their natural state.[193] However, the guide suggests that incorporating principles such as embracing the local context, empowering meaningful engagement, and fostering sustainable livelihoods could enhance the effectiveness of The Act in achieving its conservation goals.[194]

For instance, amending The Act to embrace the local context could involve requiring comprehensive assessments of local communities' needs and aspirations before designating or managing wilderness areas.[195] This ensures that preservation efforts align with the unique characteristics of each region.[196] Additionally, introducing provisions for meaningful stakeholder engagement and shared conservation goals could enhance collaborative governance structures, promoting inclusivity and community involvement in decision-making processes related to wilderness designations.[197]

Moreover, adaptive management strategies, as advocated for in the guide, could be incorporated into The Act to allow for flexibility in managing wilderness areas.[198] This adaptability ensures that management plans can be periodically reviewed and adjusted based on evolving ecological insights, community needs, and scientific advancements.[199] Fostering sustainable livelihoods and integrating economic considerations into conservation planning, as highlighted by Miranda-Castro, could strike a balance between conservation and human well-being, acknowledging the dependence of communities on natural resources.[200]

In conclusion, Miranda-Castro's guide provides not only a persuasive model for collaborative conservation but also a valuable resource for reevaluating and potentially amending The Act.

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192 *See id.*
193 *See The Wilderness Act*, *supra* note 1.
194 Miranda-Castro, *supra* note 184.
195 *Id.*
196 *Id.*
197 *Id.*
198 *Id.*
199 *Id.*
200 *Id.*

Conclusion

Lawmakers should consider these arguments and engage in a thoughtful and informed debate about how to update the Wilderness Act to better protect and preserve the wilderness in the face of contemporary challenges. The focus should shift from a "hands-off" policy to one that evaluates the ecological impacts of the intervention on a case-by-case basis, with an emphasis on maintaining the values for which wilderness areas were originally established. Utilizing cooperative agreements can facilitate collaboration among stakeholders, including environmental groups, government agencies, and local communities, to develop sustainable management plans that balance conservation with responsible recreational use. Additionally, incorporating scientific research and data-driven decision-making into wilderness management can help inform policies that address emerging threats such as climate change, invasive species, and habitat degradation.