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**James M. Jeffords Center's
Vermont Legislative Research Service**



**The Effects of Firing Ranges in Vermont:
How Lead and Noise Impact Communities**

Firing ranges offer citizens the joys of outdoor recreation, simulated hunting and sport shooting. At the same time, ranges pose complex issues for local communities, including: gun safety; environmental impact of lead contamination in soil and groundwater from abandoned bullets; and, noise pollution affecting firing range neighbors and surrounding communities. This report presents an overview of firing ranges, the laws that regulate them in Vermont and other states around the country, current research on relevant health and environmental factors, and proposed best management practices for outdoor ranges. A synthesis of the relevant legal, health and environmental implications of firing ranges in the United States reveals which policies best suit Vermont's communities and environment.

Firing Ranges in Vermont

Of the 32 total firing ranges located throughout Vermont, 20 include outdoor facilities.¹ By comparison, New York has 235 firing ranges.² If calculated on the bases of reported gun ownership, Vermont does have more firing ranges per gun owner than New York.³ In 2001, 42 percent of Vermonters surveyed said they owned a gun.⁴ Broken down, Vermont has over "70,000 licensed resident hunters and an unknown number of handgun owners."⁵ As illustrated

¹ Vermont Fish & Wildlife Department, "Shooting Ranges in Vermont Directory." accessed 24 March 2011, www.vtfishandwildlife.com/library/Vendors_and_sources/Shooting_Ranges_in_Vermont.pdf.

² U.S. EPA, "Lead & Lead Poisoning," accessed 24 March 2011 <http://www.epa.gov/region02/lead/>.

³ Calculated by multiplying the total population in each state times the percent of gun owners in the state (source from footnote 4) then dividing that by the number of firing ranges. As a result of that calculation, Vermont has 1 firing range for every 8,213 gun owners, New York has 1 firing range for every 14,843 gun owners.

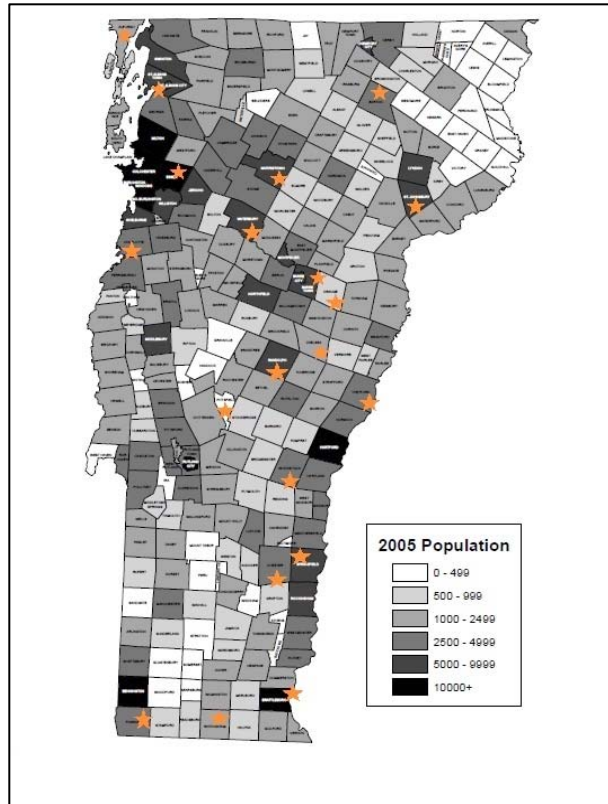
	Firing ranges	2010 pop	gun owners	gun owners per firing range
VT	32	625,741	262,811	8,213
NY	235	19,378,102	3,488,058	14,843

⁴ North Carolina State Center for Health Statistics, "Behavioral Risk Factor Surveillance System," accessed 2 May 2011, <http://www.schs.state.nc.us/SCHS/brfss/2001/us/firearm3.html>.

⁵ Picard, "Home for the Range?: So many guns in Vermont, so few safe places to shoot them."

in the map below (on which the locations of firing ranges are denoted by stars), 80 percent of the 20 outdoor facilities in Vermont lie within or adjacent to towns with populations over 5,000; the remaining 20 percent of outdoor ranges lie within or adjacent to towns with populations over 10,000.⁶

According to an investigative report by Ken Picard of *Seven Days*, “[t]here are surprisingly few publicly accessible ranges around the state,” given Vermont has “the highest per-capita rate of gun ownership in New England.”⁷ (As shown above, this assertion may not hold when one calculates the number of firing ranges per gun owner, which, as shown above finds Vermont with a higher number of firing ranges than New York.) Picard argues that what he sees as the shortage of firing ranges in the Vermont



creates “problems for gun owners and non-owners alike. Several accidental shootings in recent years, including the 2008 death of John Reiss, a former professor at St. Michael’s College, highlight the seriousness of the issue. Reiss was killed in his own home in Essex by a stray bullet from a Soviet-era SKS semiautomatic carbine.”⁸ Gun ranges “are not officially regulated in Vermont, but state officials say [unregulated] facilities...are on their way to becoming things of the past.”⁹ The Vermont Agency of Natural Resources, for example, provides safety assessments of ranges, and “closed down an unofficial shooting area on state-owned land in Middlesex after a safety assessment determined the site wasn’t appropriate for target practice” in September 2010.¹⁰

Current Firing Range Policy in Vermont

In 2006 Vermont Governor James Douglas signed Act 173 into law.¹¹ The law grants immunity from civil liability for damages or injunctive relief resulting from noise pollution to owners, operators, or any person lawfully using the ranges who are in “substantial compliance with any

⁶ Vermont Department of Health, “2005 Vermont Population Estimates: Figure 2,” accessed 14 April 2011, <http://healthvermont.gov/research/2005pop/2005pop.aspx>.

⁷ Picard, “Home for the Range?: So many guns in Vermont, so few safe places to shoot them,”

⁸ Picard, “Home for the Range?: So many guns in Vermont, so few safe places to shoot them.”

⁹ Picard, “Home for the Range?: So many guns in Vermont, so few safe places to shoot them.”

¹⁰ Picard, “Home for the Range?: So many guns in Vermont, so few safe places to shoot them.”

¹¹ Vermont Public Radio, “Douglas Signs Shooting Range Protection Bill,” accessed 12 April 2011, http://www.vpr.net/news_detail/74965/.

noise use condition of any issued municipal or state land use permit otherwise required by law”¹²

According to Act 173, only owners of property abutting a firing range may bring nuisance claims against that range. A range does not constitute any form of nuisance if said range meets the following conditions:

- the range was established prior to the acquisition of the property owned by the person bringing the nuisance claim; and
- the frequency of the shooting or other alleged nuisance activity at the range has not significantly increased since acquisition of the property owned by the person bringing the nuisance claim.¹³

The Vermont Fish & Wildlife Department created the Shooting Range Improvement Grant Program to “encourage the improvement of shooting ranges and to support their operation.”¹⁴ The program encourages range owners and operators to apply for grant funds that are then used to reimburse eligible project expenditures for up to 75 percent of the total cost. Many projects are eligible for grant funding including lead recovery systems, lead recycling, lead mitigation projects and noise abatement structures.

Environmental & Health Impact of Lead

According to the EPA, “an estimated 9,000 non-military outdoor ranges exist in the United States, collectively shooting millions of pounds of lead annually.”¹⁵ Firing ranges can damage the environment and “contaminate the soil, and possibly the groundwater, with lead from the birdshot, bullets, and bullet fragments, as well as produce airborne lead dust.”¹⁶ The impact of lead in firing ranges is long lasting. When bullets are left in shooting ranges, “lead oxidizes when exposed to air and dissolves when exposed to acidic water or soil. Lead bullets, bullet particles, or dissolved lead can be moved by storm water runoff.”¹⁷ Dissolved lead can then “migrate through soils to groundwater,” contaminating soil in the area.¹⁸

¹² Vermont Legislature, “Legislative Documents: No. 173. An Act Relating To Sport Shooting Ranges,” accessed 4 May 2011, <http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2006/acts/ACT173.htm>.

¹³ Vermont Legislature, “The Vermont Statutes Online (10 V.S.A. § 5227),” accessed 12 April 2011, <http://www.leg.state.vt.us/statutes/fullsection.cfm?Title=10&Chapter=119&Section=05227>.

¹⁴ Vermont Fish & Wildlife Department, “Shooting Ranges Grants & Information Page,” accessed 19 April 2011, http://www.vtfishandwildlife.com/Shooting_Range_Grants_page.cfm.

¹⁵ U.S. EPA, “Lead & Lead Poisoning.”

¹⁶ U.S. EPA, “Public Safety Management,” access 24 March 2011, <http://www.epa.gov/tribalcompliance/pubsafety/pspublicdrill.html>.

¹⁷ U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges,” 2005, page I-2, accessed 4 April 2011, www.epa.gov/region2/waste/leadshot/epa_bmp.pdf.

¹⁸ U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges.”

Lead is particularly dangerous because its toxicity targets the nervous system.¹⁹ Lead toxicity can cause many health risks including increased blood pressure, digestive problems, anemia, brain damage and neurological disorders, kidney damage or dysfunction, memory and concentration problems, miscarriages among pregnant women.^{20,21} Children are especially at risk and have similar symptoms including stunted growth, hearing problems, brain and neurological damage, headaches, impaired vision and motor skills.²²

According to the EPA, the “three major sources for human exposure to lead are lead-based paint, lead in dust and soil and lead in drinking water.”²³ Typically, human exposure to lead occurs through ingestion or inhalation of contaminated materials.²⁴ On firing ranges, inhalation of lead dust while firing or while performing maintenance or cleanup are the primary exposure triggers to lead. While the EPA encourages cautiousness, they state that, “the relative risk of lead exposure to people in a well managed facility is low.”²⁵

Aside from the effect of lead on humans, the EPA found that “detrimental effects due to elevated lead levels can also be found in animals. Excessive exposure to lead, primarily from ingestion, can cause increased mortality rates in cattle, sheep and waterfowl.”²⁶

Federal Lead Regulations and Policies

With backing from the federal EPA, the Centers for Disease Control and Prevention (CDCP) and a large number of states that have identified human exposure to all forms of lead as a major health concern, citizen lawsuits have been the catalyst behind most legal actions against outdoor shooting ranges. Related legislation includes the EPA’s Resource Conservation and Recovery Act (RCRA) and the Clean Water Act (CWA).²⁷ To date, most litigation concerns have been at ranges where the shot fall zone impacts water or wetland areas, causing potential environmental and human health risks to be greater. However, legal and government action may be taken against any shooting range, including those not located near water bodies, if proper range management programs are not implemented. Specifically, the laws “provide citizens with the right to sue in cases in which the environment and human health are threatened.”²⁸ The laws embody a “cradle-to-grave” philosophy “to ensure the protection of human health and the environment when generating, transporting, storing, treating and disposing of hazardous waste.”²⁹ The Resource Conservation and Recovery Act “potentially

¹⁹ Agency for Toxic Substances and Disease Registry, “Lead,” accessed 24 March 2011, <http://www.atsdr.cdc.gov/tfacts13.pdf>.

²⁰ Agency for Toxic Substances and Disease Registry, “Lead.”

²¹ U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges.”

²² U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges.”

²³ U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges.”

²⁴ U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges.”

²⁵ U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges.”

²⁶ U.S. EPA, “Best Management Practices for Lead in Outdoor Shooting Ranges.”

²⁷ U.S. EPA, “Best Management Practices for Lead at Outdoor Shooting Ranges.”

²⁸ U.S. EPA, “Best Management Practices for Lead at Outdoor Shooting Ranges.”

²⁹ U.S. EPA, “Best Management Practices for Lead at Outdoor Shooting Ranges.”

applies to many phases of range operation because lead bullets/shot, if abandoned, may be a solid and/or hazardous waste and may present an actual or potential imminent and substantial endangerment.”³⁰

Under the RCRA, lead shot is not considered a hazardous waste at the time it is discharged from a firearm because it is “used for its intended purpose. However, spent lead shot (or bullets), left in the environment is subject to the broader definition of solid waste written by Congress and used in sections 7002 and 7003 of the RCRA statute.”³¹ Under the RCRA, ranges must implement best management practices that mandate the retrieval of lead shot and its separation from the soil. Collected lead may be temporarily stored on range property in closed, sealed containers, though these materials must be routinely inspected and ultimately recycled. Ranges that partake in best management practices including lead removal will: avoid contamination of the site and potential impacts to human health and the environment; reduce liability with regard to potential government agency or citizen suit action; and, possibly, benefit economically from the recycling of lead.³²

At ranges throughout the United States, lead management practices remain inconsistent. There are four general categories of lead management policy: 1) Some range owners/operators have examined the impact of range operations on human health and the environment and have implemented procedures to manage and/or remove accumulated lead from ranges. 2) Other owners are just beginning to characterize and investigate their ranges in order to design an environmental risk prevention and/or remediation program(s) specific to their sites. 3) Another group of ranges has adopted a “wait and see” policy – taking no action until specifically required to do so by law or clear guidance is in place. 4) A small, but important group of range owners/operators remain unaware of lead’s potential to harm human health and the environment, and of existing federal and state laws.³³

State Laws Concerning Lead: Illinois, North Carolina, Massachusetts

The Naperville Park District in Naperville, Illinois, on October 13, 2000, “became the first range to be issued a National Pollution Elimination Discharge System (NPDES) permit.”³⁴ The Sportsman’s Park “had the only NPDES permit issued to an operating firing range in the United States as of the end of 2004.”³⁵ The Clean Water Act “requires an NPDES permit issued by the Illinois Environmental Protection Agency (IEPA) when any ‘pollutant’ is discharged into ‘the

³⁰ U.S. EPA, “Best Management Practices for Lead at Outdoor Shooting Ranges.”

³¹ U.S. EPA, “Best Management Practices for Lead at Outdoor Shooting Ranges.”

³² U.S. EPA, “Best Management Practices for Lead at Outdoor Shooting Ranges.”

³³ U.S. EPA, “Best Management Practices for Lead at Outdoor Shooting Ranges.”

³⁴ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges,” 2005, (p.83) accessed 15 April 2011 www.iowadnr.gov/files/lead/enviro_mngt.pdf

³⁵ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

water of the United States.”³⁶ The NPDES permit “requires that the trap range use steel shot and biodegradable targets, manage the litter created by the shotgun wads, and monitor water quality.”³⁷ To avoid costs, Illinois policy recommends “reorienting ranges to avoid water or wetland areas or switching to non-lead ammunition.”³⁸ North Carolina conducts annual composite soil sample tests on firing ranges, testing pH and phosphate levels (it does not mention lead).³⁹

The North Carolina Department of Correction Policy B-2 requires a “pH range must be maintained between 6.5 and 8.5” and the phosphate index must be “at least 50 to maintain sufficient nutrients for plant life.”⁴⁰ The policy also recommends mowing grass at ranges “early in the morning while it is still slightly damp to prevent generating airborne dust.”⁴¹ This issue of lead cleanup is vague, recommending facilities “should” follow EPA suggestions, reclaiming backstop “when it contains at least 20 pounds of lead per square foot, a maximum of 100,000 rounds per lane have been fired, or every one to five years.”⁴² In October 2010, Vance County, North Carolina established a new Ordinance mandating that firing ranges be “designed to contain all of the bullets, shot, arrows or other projectiles or any other debris on the range facility.”⁴³ There are no specific references in the Ordinance to lead or how workers will be protected from lead poisoning, though the Ordinance is an example of a community attempting to contain hazardous waste. Additionally, the new Ordinance mitigates noise at the property line, “to not exceed 65dBA when located adjacent to residential or commercial property or 75dBA when adjacent to industrial property.”⁴⁴ A facility’s failure to comply with this Ordinance “may be restrained, corrected, or abated, as the case may be, by injunction or other appropriate proceedings as allowed by state law.”⁴⁵ Violators may also be subject to civil and criminal penalties, ranging from \$100 per violation to a misdemeanor “punishable by imprisonment not to exceed 30 days.”⁴⁶

The Massachusetts Lead Shot Initiative (LSI) is a “partnership between the Massachusetts Department of Environmental Protection (DEP) and representatives of the shooting sports community, including the Gun Owners’ Action League, Massachusetts Sportsmen’s Council,

³⁶ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

³⁷ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

³⁸ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

³⁹ North Carolina Department of Correction, “Safety, Occupational & Environmental Health: Policy B-2,” Page B-2.7, accessed 14 April 2011 www.doc.state.nc.us/dop/policy_procedure_manual/F.3000.pdf

⁴⁰ North Carolina Department of Correction, “Safety, Occupational & Environmental Health: Policy B-2.”

⁴¹ North Carolina Department of Correction, “Safety, Occupational & Environmental Health: Policy B-2.”

⁴² North Carolina Department of Correction, “Safety, Occupational & Environmental Health: Policy B-2.”

⁴³ Vance County, “Shooting Range Ordinance: Adopted October 4, 2010,” accessed 14 April 2011 www.vancecounty.com/shootingrangeregulationsoct4.pdf

⁴⁴ Vance County, “Shooting Range Ordinance: Adopted October 4, 2010.”

⁴⁵ Vance County, “Shooting Range Ordinance: Adopted October 4, 2010.”

⁴⁶ Vance County, “Shooting Range Ordinance: Adopted October 4, 2010.”

National Shooting Sports Foundation (NSSF).⁴⁷ During visits to the range, the DEP offers “range managers a starting point for evaluating lead management issues and potential environmental problems that are specific to their facility.”⁴⁸ After each visit, “the DEP LSI representative sends the facility a letter identifying any lead management or other environmental issues the range needs to address and alternatives for dealing with these issues.”⁴⁹ In this letter, the DEP asks “every facility to develop a written best management practices or Environmental Stewardship Plan (ESP) for its ranges using NSSF and EPA guidance. To assist clubs, DEP provides them with an electronic ESP outline based on the plan format that appears in *Environmental Aspects of Construction and Management of Outdoor Shooting Ranges*.”⁵⁰ The DEP and LSI urge facilities to “periodically reclaim and recycle the lead as scrap metal.”⁵¹

Many states in the Midwest use “excavation equipment to remove surface soil and lead shot and shaker screens to separate the shot from the soil,” and the lead is then recycled.⁵² But the same solution will not work in current Massachusetts’ ranges because the “terrain, soil types, and type and amount of vegetation” and the location of ranges tend to be more “hilly terrain, covered with rocks, boulders, [and] trees.”⁵³ Due to the difficulties of excavation, Massachusetts uses a high powered-vacuum to recover tons of lead at facilities.⁵⁴ Since 1997, LSI partners have “worked to secure \$50,000 in Pittman Robertson funds from a program administered by the Massachusetts Division of Fisheries and Wildlife to help facilities pay for improvements related to environmental management of their ranges.”⁵⁵

Health & Environmental Impact of Noise

According to the CDC, high levels of noise can lead to “hearing loss, Tinnitus (ringing in the ear, which might be permanent), stress, anxiety, high blood pressure, gastro-intestinal problems,

⁴⁷ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁴⁸ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁴⁹ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁵⁰ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁵¹ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁵² Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁵³ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁵⁴ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

⁵⁵ Interstate Technology & Regulatory Council, “Environmental Management at Operating Outdoor Small Arms Firing Ranges.”

and chronic fatigue.”⁵⁶ Other studies have been done detailing the recommended levels of noise and hearing protection options.

In 2001, the “National Institute for Occupational Safety and Health (NIOSH) received an employee request for a health hazard evaluation of a Special Weapons Assault Team (SWAT).”⁵⁷ During their experiment, “the peak sound pressure levels for the various weapons ranged from 156 to 170 decibels (dB SPL), which are greater than the recommended allowable 140 dB SPL exposure guideline from NIOSH.”⁵⁸ With protective earplugs, earmuffs, and “customized SWAT team hearing protectors,” the shooters were provided safety from noise levels “between 25 and 35 dB of peak reduction. Double hearing protection (plugs plus muffs) added 15-20 dB of peak reduction.”⁵⁹

In another test, “Groups I and II were exposed to 3-4 and 4-144 impulses of noise at mean C-weighted peak sound pressure levels of 154 dB and 156 dB, respectively.”⁶⁰ The results showed that “even short-term exposure to impulse noise from small-caliber firearms might cause temporary hearing impairment measured by TEOAE.”⁶¹ The study concluded that, “the use of earmuffs is strongly recommended, because most of them seem to effectively attenuate impulse noise from small-caliber firearms.”⁶²

Regarding noise effects outside of the firing ranges, tensions have arisen between land owners and firing range owners in Vermont (see discussion of Vermont’s Act 173 which was passed to provide immunity for range owners from law suits over noise discussed above). Additionally, studies have shown noise may have a negative impact on wildlife, including “adverse physiological and behavioral changes from intrusive sounds and other human disturbances.”⁶³ Scientists have measured physiological responses to noise by measuring increased heart rates and animal behavior.⁶⁴ Some sounds cause high levels of stress, suppressed immune systems and disrupted mating patterns and habitats for raising young.⁶⁵

⁵⁶Center for Disease Control and Prevention, “Take Aim at Protecting Yourself,” accessed 14 April 2011, http://www.cdc.gov/niosh/blog/nsb051809_firingrange.html.

⁵⁷ W. J. Murphy and R. L. Tubbs, “Assessment of noise exposure for indoor and outdoor firing ranges,” *Journal for Occupational Environmental Hygiene*, 2007 Sep;4(9):688-97, accessed 14 April 2011, <http://www.ncbi.nlm.nih.gov/pubmed/17654224>.

⁵⁸ Murphy and Tubbs, “Assessment of noise exposure for indoor and outdoor firing ranges.”

⁵⁹ Murphy and Tubbs, “Assessment of noise exposure for indoor and outdoor firing ranges.”

⁶⁰ M. Pawlaczyk-Luszczynska, A. Dudarewicz, M. Bak, M. Fiszler, P. Kotylo, M. Sliwinska-Kowalska, “Temporary changes in hearing after exposure to shooting noise,” *International Journal of Occupational Medicine and Environmental Health*, 2004;17(2):285-93, accessed 14 April 2011, <http://www.ncbi.nlm.nih.gov/pubmed/15387085>.

⁶¹ Pawlaczyk-Luszczynska et al., “Temporary changes in hearing after exposure to shooting noise.”

⁶² Pawlaczyk-Luszczynska et al., “Temporary changes in hearing after exposure to shooting noise.”

⁶³ National Park Service, “Effects of Noise,” National Park Service U.S. Department of the Interior, accessed 5 May 2011, <http://www.nature.nps.gov/naturalsounds/impacts/>.

⁶⁴ A.N. Moen, S. Whittlemore and B. Buxton, “Effects of disturbance by snowmobiles on heart rate of captive white-tailed deer,” *New York Fish and Game J.* 1982, 29:176- 183, accessed 5 May 2011

⁶⁵ National Park Service, “Effects of Noise”

Additionally, “the inability of creatures to successfully communicate or otherwise employ their auditory senses is detrimental to the long-term survival of these displaced creatures and the overall biological integrity of the environment.”⁶⁶

Federal, Vermont, Ohio and Minnesota State Laws Regarding Noise

Noise laws vary drastically from state to state and in most cases from county to county. Many counties, even ones that contain firing ranges, do not have specifically mandated ordinances, but instead rely on general noise ordinances. In addition, many states and counties have taken considerable measure in order to shield ranges from lawsuits relating to noise levels through legislation that excuses ranges from lawsuits.⁶⁷ Currently, there are six states that do address firing ranges specifically in legislation.⁶⁸ However the legislation usually only encourages ranges to comply with the National Rifle Association's (NRA) range safety standards as outlined in their most up-to-date edition of their book *The NRA Range Source Book*.⁶⁹

Noise ordinances in Vermont vary by community. In Essex, for example, town ordinance 6.08.050 states “No person shall discharge a firearm within the town of Essex within the hours of sunset and sunrise except when such hours are prescribed for the hunting of game birds or animals, and then such privilege shall extend only to licensed hunters for the sole purposes of taking game.”⁷⁰ In Morristown, Vermont, the use of firearms is permitted between the hours of 5 A.M. and 10 P.M.⁷¹ The town of St. Johnsbury’s Ordinance Section 8-2 states: “no person shall discharge or cause to be discharged or fired, any revolver, pistol, rifle, shotgun, air-powered rifle, or other similar firearm within the former limits of the Village of St. Johnsbury or any densely populated areas or town. This section shall not prevent the discharge of firearms on any properly constructed firing range or in the conduct of a contest, shoot or meet, when reasonable precautions are taken for the protection of public safety.”⁷²

Ohio is one of few states that created specifically mandated standards that firing ranges must adhere to, and revised its previous statute in 2002 to be more specific.⁷³ The current legislation

⁶⁶ Al Radle, “The Effect of Noise on Wildlife: A Literature Review,” July 2005, accessed 5 May 2011, http://interact.uoregon.edu/medialit/wfae/library/articles/radle_effect_noise_wildlife.pdf .

⁶⁷ The extent to which such laws have been promulgated or promoted by the NRA is an issue for future research.

⁶⁸ Office of Legislative Research, “Shooting Range Safety Standards in Other States,” accessed 19 April 2011, <http://www.cga.ct.gov/olr/sitesearch.asp>

⁶⁹ Office of Legislative Research, “Shooting Range Safety Standards in Other States,” accessed 19 April 2011, <http://www.cga.ct.gov/olr/sitesearch.asp>

⁷⁰ Town of Essex, Vermont, “Ordinances & Regulations,” accessed 13 April 2011, http://essex.org/index.asp?Type=B_BASIC&SEC={EB31A508-77F8-4D9B-92A3-92BA017F367F}

⁷¹ Morristown, Vermont, “Town Ordinances,” accessed 13 April 2011, <http://morristownvt.org/documentsforms/ordinances.html>

⁷² St. Johnsbury, Vermont, “Ordinances of the town of St Johnsbury VT, Ch 8, Miscellaneous Offenses,” accessed 13 April 2011, http://www.town.st-johnsbury.vt.us/index.asp?Type=B_BASIC&SEC={7A4EE1B6-ED1D-41D1-B5E7-B7D553D21DA9}

⁷³ Ohio Administrative Code, “1501:31-29-03 Shooting Ranges,” accessed 19 April 2011, <http://codes.ohio.gov/oac/1501%3A31-29-03>

requires ranges to “substantially comply” with the guidelines outlined in the *NRA Range Source Book*, specifically Section I, Chapter VI.⁷⁴ Additionally, Ohio has outlined hours of operation for ranges to be between the hours seven a.m. until ten p.m. with the exception of indoor and archery ranges.⁷⁵ More specifically, Ohio also regulates the noise levels for ranges at their boundaries with other property, specifically citing, “If the sound level exceeds ninety decibels dB(A) for one hour out of twenty-four hours or eighty-five decibels dB(A) for eight hours out of twenty-four hours and the sound measuring receiver is located at the boundaries of the range property.”⁷⁶

Minnesota statutes 87A.03 states that, “a shooting range that operates in compliance with the shooting range performance standards must be permitted to do all of the following within its geographic boundaries, under the same or different ownership or occupancy, if done in accordance with shooting range performance standards.”⁷⁷ As with Ohio, Minnesota strictly limits the use of firing ranges to operation between seven a.m. and ten p.m.⁷⁸ Minnesota also encourages its ranges to freely acquire new grounds and area to act as noise buffers for their ranges.⁷⁹ Ranges that meet the standards set forth in this statute are considered to be in “nonconforming use” and are further exempt from any future litigation that would effect their operation.⁸⁰ Being given the status of “nonconforming use” also means that a court cannot force a shooting range in compliance with the “shooting range performance standards” to permanently close unless the court deems it a clear and immediate safety hazard.⁸¹

Conclusion

As the environmental and communal impacts of firing ranges such as lead and noise pollution are more fully researched and recognized, federal and state regulations concerning firing ranges have increased. Federal EPA laws require that best management practices be implemented in ranges around the country to best protect their surrounding environment and communities. Despite these actions, lead and noise management practices remain inconsistent around the country. Additionally, several states including Vermont have passed laws to protect firing range owners and operators from lawsuits filed by community members concerning noise and pollution.

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⁷⁴ Ohio Administrative Code, “1501:31-29-03 Shooting Ranges.”

⁷⁵ Ohio Administrative Code, “1501:31-29-03 Shooting Ranges.”

⁷⁶ Ohio Administrative Code, “1501:31-29-03 Shooting Ranges.”

⁷⁷ Minnesota Office of the Revisor of Statutes, “87A.03 Compliant Ranges; Authorized Activities,” accessed 19 April 2011, <https://www.revisor.mn.gov/statutes/?id=87A.03>

⁷⁸ Minnesota Office of the Revisor of Statutes, “87A.03 Compliant Ranges; Authorized Activities.”

⁷⁹ Minnesota Statute § 87A. 03

⁸⁰ Minnesota Statute § 87A. 03

⁸¹ Minnesota Statute § 87A. 07(1)

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