

Wildlife Center of Virginia's Position on Lead Toxicity in Raptors

Summary of the issue:

Lead is a soft, pliable, elemental metal that is found in naturally occurring deposits around the world. While it has been used for centuries for many purposes, the highly toxic properties of lead have become well-known over the last 100 years through the issues of food contamination in cans sealed with lead solder, the toxic effects of lead-based paints and glazes, the polluting effects of leaded gasoline, the presence of lead in drinking water which passes through pipes connected with lead solder, and, more recently, the toxic effects of lead ingested by wildlife.

In wildlife, lead is most toxic when consumed by an animal, as opposed to lead bullets or shot simply lodging in muscle tissue. Exposure to digestive fluids and stomach acids breaks down the lead, allowing it to be absorbed into the blood stream and distributed to internal organs, the nervous system, the respiratory system, and the renal system. Lead may also leach from lead fragments lodged in joints and in bone marrow.

In 1991, the public became very concerned that nearly four million waterfowl were dying each year from lead poisoning in North America. Ducks and geese were ingesting bits of lead they found while filter-feeding on the bottoms of wetlands, marshes, shallow estuaries, or other bodies of water. The lead fragments the birds ingested were mainly shotgun pellets that had *missed* their primary target and rained down over the water. The birds would deliberately pick up this shot and swallow it, thinking it to be food or grit they need for digestion. After years of debate, the federal government finally enacted a ban on the use of lead shot for most waterfowl hunting. The use of lead and lead-based projectiles for hunting of so-called *upland* species of game and nuisance wildlife has remained legal, presumably on the logic that spent shot which falls upon the land is very unlikely to be found and ingested by wildlife.

However, recent studies are making it clear that lead fired at upland game is also finding its way into non-target wildlife, but mainly from lead projectiles that actually *hit* their intended targets. This lead is being ingested by eagles and other raptors when they prey upon wounded animals that have been shot, or when they scavenge the remains and entrails of animals that have been shot and left in the field. While this toxic threat has existed for decades, new technologies and increased surveillance have put more and more of these poisoning cases in the public spotlight.

At the Wildlife Center of Virginia, a significant number of bald and golden eagles, vultures, and smaller raptors have been found to suffer from this type lead poisoning, frequently with fatal effect. In 2011, for example, the Center admitted 36 bald eagles. Of this total, six had observable symptoms of lead intoxication, including a general listlessness, inability to maintain balance, refusal to eat, overall weakness, and lack of muscle coordination. In severe cases, there can be a head tilt, blindness, convulsions, and eventually death. Fifteen more eagles admitted were found to have elevated levels of lead in their blood, indicating some degree of intoxication, even if the indications were less obvious.

As in waterfowl, the source of the toxic lead is almost certainly lead shot and bullet fragments that were ingested by the birds as they feed. At times, the actual lead shot or bullet fragment in the digestive tract

will show up on an x-ray and can be surgically removed, but not always. Even if the actual projectile has passed through the digestive tract and out of the body, dangerous amounts of dissolved lead can still be circulating in the blood or stored in the bones or internal organs of the body. No level of lead in the body is considered “safe”.

The current debate:

Controversy over what to do about the problem of lead toxicity in wildlife erupted in 2010, when two conservation organizations sought to ban the manufacture, sale, and use of ALL lead-based ammunition components. Over the strong objections of the Wildlife Center of Virginia and many other groups, The Center for Biological Diversity (CBD) and the American Bird Conservancy filed a petition with EPA to achieve this sweeping prohibition through the Toxic Substances Control Act. As expected, EPA immediately rejected the petition, because the requested action would have affected not only those using lead for hunting purposes, but also all military and police agencies, as well as competitive and recreational shooters, in effect eliminating nearly all available ammunition for every firearm currently in use in the United States. Since the overwhelming majority of lead-based munitions components pose little or no threat to the environment, EPA refused to even consider such an over-reaching approach to a relatively finite problem.

In spite of EPA’s prompt rejection of the petition, several organizations representing gun owners and shooting sports, including the National Rifle Association (NRA), denounced what they saw as a deliberate attack on their millions of members. They mounted a national campaign that branded the lead toxicity issue as a backdoor attempt to ban legal hunting and interfere with constitutionally protected gun ownership. Even though this was not the intent of the petitioners, it clearly would have been the unintended consequence of their initiative. As a result, the discussion of lead toxicity related to spent bullets and shot is now extremely polarized. Even the ability to hold a civil public discussion of the issue has become far more difficult.

The challenge is not to find a way to ban the use of all lead – it is to find a way to reduce the amount of toxic lead fragments available to non-target wildlife and to do it without unreasonably affecting those whose activities are otherwise legal and acceptable to the public. It is especially important to focus any proposed solutions on the actual problem – that is, the threats posed by lead fragments in animal carcasses or parts that have been left in the field – without vilifying or unnecessarily alienating people who have not knowingly done anything wrong.

The Wildlife Center has identified some simple voluntary steps that hunters can take to dramatically and immediately reduce the unintentional poisoning of bald eagles and other raptors. The Center has also identified some additional steps that wildlife rehabilitators, government wildlife agencies, and interested members of the public can take to help document and publicize the scope of the lead-poisoning problem.

So, what can we do to address this problem?

While the political and regulatory aspects of this problem are very complex, the good news is that this problem is relatively straightforward and could be relatively easy to solve. The Wildlife Center of

Virginia believes that the solution to this problem can be achieved through information, education, and voluntary compliance with safety procedures by hunters. To a large extent, the problem is a general lack of awareness of the current impacts of lead poisoning on a variety of species, including eagles, and the need for good, dependable information about both the true nature of the risk and the range of solutions available to mitigate that risk. Hunters need to be made aware of how serious this problem is, and understand what they can do to reduce or eliminate the problem.

The Wildlife Center is proposing four very achievable steps which could dramatically improve the situation, with minimal hardship on anyone, and without the need for controversial legislative or regulatory action. The four steps WCV is recommending are:

- 1) Voluntary Efforts by Hunters** – The issue of lead poisoning of eagles and other birds of prey can be almost entirely eliminated through one of two voluntary steps hunters can take: 1) the use of non-lead ammunition for actual hunting; and/or 2) the recovery and proper disposal of animal carcasses or parts which may contain lead fragments that are left in the field. For most popular calibers of hunting rifles, ammunition with non-lead projectiles is available. While slightly more expensive, the use of non-lead projectiles eliminates the need for any further attention to the lead-poisoning issue on the part of the hunter. To minimize the burden of the additional cost, lead ammunition can be used on the range to sight-in or practice with hunting weapons, but non-lead ammunition of the same size and ballistic characteristics can be used in actual pursuit of quarry.

If hunters are unwilling or unable to switch from lead bullets and shot, hunters should bury animal carcasses or parts that may contain lead fragments that are left in the field. Tissues within 16-20 inches of the trajectory of the bullet tract may be contaminated with lead fragments. If burial is not practical, due to the size of the remains or frozen ground, these animal parts can be covered with brush to prevent avian scavengers, such as eagles or vultures, from reaching the remains. While scavenging mammals, such as opossums, raccoons, foxes, coyotes, or bears, may still feed on these remains, the effects of very small amounts of lead seem to be less significant in mammals than in birds.

Citizen Action: If you are a hunter, simply adopt these practices, and encourage hunting buddies to do the same. Members of hunting clubs can propose these actions for adoption as club rules. Landowners where hunting is allowed can require the use of non-toxic ammunition or proper disposal of remains. Family members or friends of hunters can give non-lead ammunition as a gift to encourage its use. Everyone can express appreciation and give positive recognition for those hunters in the community who are using non-toxic ammunition or complying with best practices for the appropriate disposal of carcasses and animal parts in the field. This can be done through letters to local hunting organizations or letters to the editor of the local paper.

- 2) Public Education and Information Campaigns** –The issue of lead poisoning from spent bullets and shot is not a new one, but is one that has gotten very little public attention in many areas. The notable exception is the lead poisoning threat identified in the habitat of the highly

endangered California condor, and the State of California's subsequent ban on the use of lead-based ammunition in the designated condor range. Local media in every community needs to be encouraged to pay attention to this issue.

Citizen Action: Contact your local media and provide them with links to information about this issue. Ask them to investigate the extent of the problem in your area, and report to the public any issues found. Reach out to hunter safety instructors in your community to encourage them to become informed about the issue of lead poisoning related to game and animal parts left in the field. Encourage them to add a section to their training course about the proper disposal of animal parts that may contain lead, and to inform their students about the alternatives to lead shot which can eliminate the problem altogether.

- 3) **Research and Diagnostics** – Wildlife hospitals and rehabilitation centers across North America need to make a concerted effort to collect blood samples for testing, according to defined and standardized protocols, to fully diagnose patients suspected of having elevated levels of lead in their blood and then to monitor their patients' response to various treatment regimens. Even facilities without in-house test equipment need to collect samples for testing elsewhere.
- Citizen Action** – Contact your local rehabilitation centers to determine if they are currently testing for lead in raptors. If not, offer to support and fund efforts to do so, or at least to collect samples for testing by others. If rehabilitation centers need technical advice, they should contact the Wildlife Center of Virginia or The Raptor Center at the University of Minnesota Vet School.

- 4) **Surveillance and Reporting** – The U.S. Fish and Wildlife Service (USFWS) and state wildlife agencies need to be encouraged to conduct targeted surveillance activities to determine the extent of lead poisoning in priority species, such as eagles and other birds of prey.
- Citizen Action: Call or write the Office of Migratory Bird Management of the U.S. Fish and Wildlife Service, and either the wildlife management or non-game wildlife program office of your state wildlife agency. 1) Encourage the USFWS to coordinate with the more than 1,500 wildlife rehabilitators across the U.S. to create standardized incident reports for potential poisoning cases, and to support the collection and testing of blood samples for the detection of lead poisoning. 2) At the state level, inquire of the relevant agency personnel what, if any, research is ongoing in your state related to lead poisoning of raptors, especially eagles. Express support if there is such a study, or encourage the agency to establish surveillance if none currently exists. Encourage coordination with wildlife rehabilitators in the state, and consideration of national reporting programs, such as WCV's WILD-ONE database, designed specifically to document wildlife health issues.**

Whatever you do, remember: No responsible, ethical hunter wants to kill an eagle or other raptor. Hunters who are not using non-toxic shot, or properly disposing of animal remains, probably don't understand the issue. We must *educate* these hunters, not judge or condemn them. By keeping it positive, we will make a difference.

Frequently Asked Questions about lead poisoning of raptors:

- **If a hunter shoots a deer, doesn't the bullet just pass through the body of the quarry, eliminating any danger of residual lead?**

Many hunters using rifles or pistols assume that the presence of an entry wound and an exit wound indicates that the bullet or other projectile has passed through the target animal and is gone. However, in nearly every case bullets will fragment or break apart, especially if they hit something hard, like a bone. Hunting bullets leave behind as much as 30 percent of the original bullet mass in the muscles or internal organs of the target animal, even when the largest part of the bullet passes through. Since most of these fragments are very small, their potential significance is easily overlooked by hunters. Only recently has it been shown that these tiny fragments of lead can be toxic if ingested by scavenging or predatory birds.

- **The federal government banned the use of lead shot over water, but isn't the lead shot that falls on the dry ground an environmental threat?**

The amount of lead from firearms ammunition being deposited in the soil in most areas is miniscule as an environmental threat, with the possible exception of fields that are heavily and repeatedly used for dove hunting. In the soil, the lead remains essentially inert. We can find bullets that were fired during the Civil War that are essentially just as they were when they left the gun in 1862. It is mainly in the wash of digestive acids that the lead breaks down to the point it can be absorbed into the system of an eagle or other animal. Lead comes from the Earth in the first place. When lead returns to the soil, in general, it is no longer a threat unless it is concentrated in very high volumes, such as in a landfill where thousands of car batteries have been discarded, or near certain industrial sites. With few exceptions (mentioned above) bullets and shot that fall on dry ground don't present much of an environment problem for wildlife.

- **What about the "Get The Lead Out Campaign" by the Center for Biological Diversity? Shouldn't we all just join that effort?**

NO! Unfortunately, the Center of Biological Diversity chose to go forward with a petition to EPA in 2010 that was seriously flawed. There was a major backlash by groups like the NRA and the National Shooting Sports Foundation. They were justifiably outraged that CBD proposed eliminating nearly all firearms ammunition available in the United States. This caused an unnecessary polarization of the debate, essentially pitting all gun owners against an initiative that was portrayed as the way to protect eagles and other raptors. Because of this serious strategic error, the Center of Biological Diversity lost its credibility on this issue with many groups, including the Wildlife Center of Virginia. While there are many talented and devoted professionals working for CBD, the organization has become a lightning rod for opposition. WCV views that organization's continued engagement with this issue to be counterproductive. Their message may be sound, but their effectiveness as a messenger has been lost.

- **Do all types of firearms present the same risk to wildlife?**

No, shotgun ammunition is generally more dangerous because each shell contains a lot more lead and frequently more than a hundred times the number of separate pieces of lead as a rifle cartridge. A single round of “bird shot” (#9 or #7½ shot) can contain hundreds of tiny lead pellets, each only slightly larger than the head of a straight pin. However, each of these lead pellets is enough to cause harm to a scavenger. Rifle and pistol ammunition typically contain only a single projectile. While these single bullets still distribute lead through the body of the quarry (up to 16 inches from the point of impact), the distribution of shotgun pellets can cover a circle several feet in diameter. A few pellets striking an animal may not kill it; in fact, pellets may have little or no effect, remaining inert in the muscle tissue. However, if the target animal is subsequently eaten by a predator, like a hawk or an eagle, those pellets can kill the predator – even months or years after the shot was fired. Many heavily populated localities require the use of shotguns for hunting deer, since the range of these guns is less than rifles or pistols. In these areas, proper disposal of what could total hundreds or thousands of animal carcasses in a single season is *critical!*

- **Is it true that non-lead bullets are less effective than lead, and can damage firearms?**

No. While it may have been true 20 years ago that so-called “steel shot” used in shotgun shells was less effective than the more dense lead shot, and that steel pellets could scratch or score shotgun barrels, modern non-lead shotgun and rifle ammunition has come a long way. Today, non-lead ammunition is as effective as or *more* effective than lead. The ballistics of copper rifle and pistol bullets are nearly identical to lead bullets but, unlike lead, they leave no residue behind, making them even better for the gun than lead bullets. Most major ammunition manufacturers now offer non-lead alternatives in most popular hunting calibers. However, for certain types of ammunition, such as buckshot and shotgun slugs and projectiles for certain types of antique or reproduction muzzle-loading weapons, lead alternatives are not yet readily available. When hunting with these types of firearms, if the non-toxic alternative is not an option, properly disposing of animal remains is critical.

- **Why are groups like the NRA fighting to keep lead bullets on the market if lead is so toxic? Don't they care about eagles and other raptors?**

The NRA's job is not to protect eagles; it is to protect the rights and privileges of their gun-owning members. The NRA is not “*fighting to keep lead in bullets*”, as such. They are fighting to prevent ill-advised regulatory changes that would harm the interests of gun owners and those who enjoy shooting sports. The 2010 petition filed with EPA would have eliminated nearly *all* of the ammunition available for any firearm in use across the United States. The NRA fought to stop that initiative; they were not fighting to continue letting people poison eagles.

- **Isn't it just the irresponsibility of hunters that is causing this problem of lead poisoning of eagles?**

Not really. Hunters are not deliberately killing eagles with the lead in their ammunition any more than parents were deliberately poisoning their children with the lead-based paint used on baby furniture and around the home. Until people know about a problem, it is hard to blame them for

not helping to solve it. Most hunters have no idea at all that their spent bullets and shot could be continuing to kill, long after the hunters have left the woods and put their guns away. There has been very little real education done on this issue.

- **This document deals with birds like eagles eating bullet fragments, but don't lead sinkers and fishing lures poison birds as well?**

Yes, there are areas where birds like loons and swans suffer high incidence of lead poisoning from ingesting lead sinkers that have been broken off of fishing tackle. While this problem is not one frequently seen by the Wildlife Center of Virginia, additional information can be found from several other sources, including EPA, (<http://water.epa.gov/scitech/swguidance/fishshellfish/animals.cfm>).

- **I have heard that some groups claim that eagles are getting the lead from sources other than bullets. Is this true?**

There is a lot of misinformation being published by people on both sides of this issue. One writer for the National Shooting Sports Foundation implied that condors, vultures, and eagles were getting lead poisoning by eating car batteries! On the other hand, some eagle defenders claim that the only solution is to ban all lead bullets, even though only a tiny percentage of lead bullets are even used in hunting. There are many sources of toxic lead in the environment. It is possible that *some* eagles may get *some* lead from sources other than ingesting bullet fragments and lead shot. However, those other sources are believed to represent a negligible risk, compared to lead projectiles in discarded animal parts. We know that eagles, vultures, and condors regularly scavenge animal remains and are exposed to lead.

- **I don't like hunting, so what's the harm if we ban all lead bullets and shot?**

Most lead-based firearms ammunition is used for national defense and public safety – by police and by the military. Target and competitive shooters, and those who own firearms for self-defense, consume the majority of munitions purchased by the private sector. Hunters use only a very small percentage of all ammunition sold in the United States each year. A ban on lead-based ammo would hurt a lot of law-abiding firearms users!

- **The Wildlife Center advises hunters to bury animal parts containing lead fragments, or just cover them with brush. While the brush might keep eagles from getting to these remains, won't other animals like raccoons, opossums, foxes, and bears be able to find this carrion and get poisoned?**

Yes, scavenging mammals may find and eat these parts. However, while there are few studies to definitively establish the effects of lead in these mammals, we do know that most scavenging mammals are much larger and heavier animals than eagles, vultures, and hawks. This means that the amount of lead per pound of body size is likely to be proportionately lower—a lower “dose” of lead, so to speak. As stated above, no amount of lead in the system is considered harmless, but incidents of lead poisoning in mammals are not frequently documented.

- **If the ground is frozen, can I just bury the remains of my game harvest in a snow bank?**

No! Studies in the upper Midwest found an increase in the number of lead-poisoned eagles in the spring, when hunting seasons were long over. A review of the circumstances revealed that the birds were feeding on carcasses and remains that had been frozen beneath the snow. As the snow melted, these toxic food sources were revealed and utilized by scavengers. The carcasses and body parts must be covered with material that will not melt, blow away, or be easily removed by avian scavengers.

The Wildlife Center of Virginia is a non-profit teaching and research hospital for native wildlife, located in Waynesboro, Virginia. The Center's goal is to rehabilitate the injured and orphaned wild animals admitted for care and return them to the wild. The Center is also committed to identifying and addressing the causes of illness and injury to its patients. Since its founding in 1982, the Center has cared for almost 60,000 wild animals, representing 200 species of birds, mammals, reptiles, and amphibians. The Center's public education programs share insights gained through the care of injured and orphaned wild animals, in hopes of reducing human damage to wildlife. The Center trains veterinary and conservation professionals from all over the world and is actively involved in comprehensive wildlife health studies and the surveillance of emerging diseases.

Additional information about the Wildlife Center is available at www.wildlifecenter.org. Contact the Center at 540-942-9453 or wildlife@wildlifecenter.org.