

Response to Citizen Petition from Nancy Tatum, Admin. Cause No. 23-FW-007

The Natural Resources Commission (NRC) received a citizen petition from Nancy Tatum to ban the use of lead shot in Indiana and sent it to the DNR to review the request. To complete this review, the DNR established a committee that included David Bausman (DNR General Counsel), Capt. Jet Quillen (Indiana Conservation Officer), Geriann Albers (Wildlife Furbearer Biologist), and Linnea Petercheff (Licensing and Permit Supervisor). A sub-committee was established to help create a website and educational information that can be provided to hunters and anglers; that sub-committee included our wildlife furbearer biologist, a fisheries biologist (since lead is used in fishing tackle), a property manager (shooting range as well as waterfowl hunting), an outreach coordinator, as well as our hunting recruitment/retention coordinator.

The petitioner has requested a change in administrative code so that lead shot would be unavailable for purchase and therefore, used by hunters. The petitioner stated that lead shot is toxic to the animals that “follow the hunter” to eat the leftover carcass. Ms. Tatum believes that education is imperative throughout Indiana for hunters that use lead ammunition. She also suggested requiring education for people before receiving a hunting license.

Lead is a naturally occurring element that can be toxic at low levels of exposure. Increased levels of lead in the environment affect both humans and wildlife, especially raptor species. This is why lead shot is regulated in Indiana.

Current Regulations

Hunters are required to use non-lead (non-toxic) shot when hunting waterfowl anywhere in the state under federal law. They are also required to use non-toxic shot when hunting mourning doves on all Fish & Wildlife areas pursuant to current administrative code in 312 IAC 8-2-3 (k). Additionally, non-lead shot is required for hunting all species on Goose Pond and Wabashiki Fish and Wildlife Areas.

Education

The DNR has drafted a new webpage informing hunters of the benefits of using non-lead ammunition, as well as recommendations for non-lead options for fishing tackle. Additionally, the DNR will be helping to educate hunters (that includes a social media campaign) on the benefits of using non-lead ammunition as well as encouraging them to clean up gut piles when lead ammunition is used to help minimize any impact to birds like bald eagles, which can be especially sensitive.

Ammunition

A variety of non-lead ammunition options are readily available for use in waterfowl hunting, since non-toxic shot is already required by federal law to hunt those species. However, lead shot is commonly used for hunting squirrels, deer, and other mammals. Depending on the ammunition type, non-lead ammunition doesn't cost much more than a lead selection. Though for a long-time copper ammunition was only available to big game hunters who purchased premium ammunition (With Copper Ammunition being very similar in price to other premium options), many of the manufacturers are releasing new, more budget-conscious copper ammunition. On the popular firearms accessory website MidwayUSA.com, many of these options are available to ship to your door. For the caliber .30-06 Springfield, which is one of the most common deer cartridges across the United States, budget lead cartridges cost around \$ 30 dollars for a standard box of 20 rounds both in local stores and online, while budget copper selections in both Remington, Hornady, Barnes and Winchester are around \$40 dollars a box. In premium selections, both copper and lead are around \$40-50 dollars a box of ammunition. For 350 Legend which is one of the most popular public land legal deer cartridges, budget lead options range from \$25-35, both in store and online. For non-lead options costs range from \$35-45. Availability is a perpetual problem for non-lead firearm ammunition, especially as the industry recovers from the significant uptick in

sales during the COVID-19 Pandemic. On top of this, there is significantly more ammunition purchased every year by target shooters compared to hunters, which means that there is less demand for hunting loads, and even less for non-lead alternatives. Due to this lower demand, manufacturers offer less non lead options and produce less of those selections. For example, for .30-06 Springfield on MidwayUSA.com there are 115 different types of ammunition available. Of those 115, only 18 are lead free. It is a similar situation for .350 Legend where of the 17 selections available, only 2 are non-lead. Because of this, hunters who prefer to shop from local stores will have a harder time finding non lead selections.

Non-Lead Research Background

The effects of lead toxicity on wildlife have been studied since before most wildlife agencies were created, with the first published instance of lead poisoning in waterfowl noted in 1874, with notes in literature regarding birds in Indiana falling ill to lead poisoning as early as 1922 at Hovey Lake in Indiana (Bellrose 1959). Between 1938 and 1954, approximately 2-3% of waterfowl deaths were attributed to lead poisoning, equating to about 1.6-3.9 million birds annually. The 1991 ban of lead ammunition for waterfowl hunting showed some success, leading to reduced bone lead levels as well as an estimated 64% reduction in lead-based mortalities on the Mississippi flyway in 1997, totaling approximately 1.4 million birds (Kimmel & Tranel 2007, Kelly et al. 2011). Ammunition was not the only source of lead poisoning in birds, however. Lead fragments from big game carcasses are also a source of lead poisoning in many scavenging birds (Slabe et al. 2022, Hanley et al. 2022, Kimmel & Tranel 2007, Kelly et al. 2011, Bedrosian et al. 2012, Green et al. 2008, Finkelstein et al. 2012, Pain et al. 2019, Hunt et al. 2009a, Hunt et al. 2009b, Grund et al. 2010).

The effects of lead poisoning are not limited to just a couple of species of birds but can affect other species that scavenge on big game carcasses, such as golden and bald eagles (Kelly et al. 2011, Bedrosian et al. 2012, Slabe et al. 2022, Hanley et al. 2022). In one study, it was found that around big game hunting seasons, admissions increased from raptors affected from lead poisonings into rehabilitation facilities. These behavior changes can have lasting consequences such as flight impairment and reduced reproductive success. Though there are thousands of instances of individual level effects of lead on eagles, research has only recently studied population level effects of lead poisoning on eagles. Acute poisoning was higher in the fall and winter compared to the summer, with the use of lead during hunting seasons corresponding both spatially and temporally to the feeding ecology of the eagles. In the Great Lakes region, 47% of the winter food for bald eagles are white-tailed deer carcasses (Cooley & Melotti 2022). Mortality events were associated with marked reduction in annual survival performance of hatchlings and reproductive females. While fewer hatchlings survived, more nonbreeding adults survived. Reducing levels of lead mortality can alleviate this survival pressure on hatchlings and breeding females, which creates more robust resilience in populations (Hanley et al. 2022).

Lead poisoning is generally not tied to a singular slug of lead in the target, but rather the fragmentation of the lead bullet. When a lead bullet hits the target, it fragments into hundreds of irregularly shaped lead fragments, with some non-bonded bullets having a weight retention of less than 50% (Grund et al. 2010). The irregular shape of these fragments increases toxicity greatly. In one study, deer killed with lead bullets were scanned with a radiograph to determine the extent of lead deposition in the carcasses. All carcasses scanned contained lead fragments with 70% containing more than 100 (Hunt et al. 2009). 90% of gut piles contained fragments as well. Along with this, these fragments can travel far from the wound channel, sometimes as far as 45 centimeters in some studies (Caudell et al. 2012).

Another source of lead poisoning is lead fishing tackle. In the loon population, lead fishing weights were responsible for 48.6% of adult loon deaths from 1982 to 2012, reducing the population of loons in New Hampshire (Pain et al. 2019).

The effects of lead poisoning are not just limited to wildlife but can have harmful impacts on human health. In Inuit populations that eat large amounts of wild game, populations had high blood lead levels, with lead shot being found in their digestive system (Levesque et al. 2003). After lead shot was banned in 1991, lead levels in the blood of newborns significantly decreased. In studies of other populations, it was found that lead levels were higher in people who ate large amounts of wild game, although it is often not the only or most importance risk factor of lead contamination (North Dakota Department of Health 2008). The ingestion of elemental lead generally is believed to be low risk compared to other vectors of lead absorption, though prolonged retention can lead to toxicity (Haldimann et al. 2002). An important

factor that can increase lead absorption is marinating game with acidic marinades. It was found that vinegar-based marinades reacted with lead to create lead acetate, which is more easily absorbed by the body and can lead to higher blood lead levels (Schulz et al. 2021).

Conclusion

The petitioner requested that lead shot be unavailable for purchase in Indiana so that it would not be available for use by hunters. The Indiana DNR cannot prohibit the sale of lead shot in Indiana because it is outside the authority of the DNR, and individuals may use that ammunition for target practice, as well as in other states. Secondly, prohibiting the sale of lead shot would likely impact retailers that sell lead shot to hunters by reducing their sales when non-lead options are not readily available or are more costly.

As we continue to manage fish, wildlife, and their habitat, the Indiana DNR believes it is important to acknowledge the effect of lead on the environment statewide. To achieve this, the DNR has developed a new website with information about the effects of lead and will share educational materials with the public to discuss the environmental benefits of using non-lead equipment when hunting and fishing. These materials will allow individuals to see how their actions can impact the environment, whether through picking up lead litter or using non-lead ammunition and tackle. Through these educational efforts, DNR will help ensure that outdoor recreation will sustain for generations to come.

References

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