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THE HUMANE SOCIETY
OF THE UNITED STATES

Testimony in Opposition to HB 2503
House Committee on Agriculture and Natural Resources
February 19, 2015
By Scott Beckstead, Senior Oregon State Director,
The Humane Society of the United States

On behalf of the Humane Society of the United States (HSUS) and our Oregon supporters, I am here to voice our strong opposition to HB 2503.

As experts testified in your hearing last September, lead from spent hunting ammunition is a significant source of lead exposure to Oregon's wildlife and residents. It is considered the greatest, largely unregulated source of lead knowingly discharged into the environment and has been documented to cause death—and tremendous suffering—in numerous species within our state, including the revered bald and golden eagle.

For the benefit of our new esteemed members, I'll briefly summarize a portion of information provided in September by Dr. Myra Finkelstein, a leading researcher in lead ammunition toxicology:

> ***"Lead is one of the most well-studied of all anthropogenic toxins and the vast body of scientific evidence clearly establishes that lead is toxic to multiple physiological systems in vertebrate organisms, including the central and peripheral nervous, renal, cardiovascular, reproductive, immune, and hematologic systems...Published studies have demonstrated that Oregon wildlife is affected by lead poisoning, [including research indicating] that even a small number of lead-containing carcasses across the landscape can lead to a high probability that scavenging species are lead exposed."***

Whether lead is inadvertently ingested by song birds while in search of seed, or unintentionally consumed by bald eagles and other scavengers when feeding from lead-tainted carcasses, definitive science has shown that lead ammunition is the source.

Fortunately, the Oregon Fish and Wildlife Commission ("Commission") and the Department of Fish and Wildlife ("Department") are aware of the risks and concerns associated with lead in hunting ammunition, and are operating with attentiveness to the complexities of this issue.

As we heard last September, the Department is approaching the possibility of reintroducing the critically endangered California condor into Oregon with caution and consideration for the species, as well as for sportsmen and women. While we would have preferred a more inclusive approach that considered the thoughts of all Oregonians, their work thus far has demonstrated the desire to take serious considerations and precautions into successfully reintroducing a species managed by the U.S. Fish and Wildlife Service under the Endangered Species Act – an endeavor that falls squarely within the purview of the Department and the Commission. Under state law (ORS 496.171-192), the Fish and Wildlife Commission, through ODFW, maintains the list of native wildlife species in Oregon that have been determined to be either "threatened" or "endangered" according to the criteria set forth by administrative rule (OAR 635-100-0105).

The Commission, along with the Department, has been entrusted with the responsibility to "protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations." This responsibility is carried out by qualified commissioners with a rich knowledge of fish and wildlife issues in our state, and they are collectively dedicated to protecting and enhancing Oregon's unique natural landscape.

For these reasons, the Commission and the Department are uniquely qualified and well-situated to address the issues and concerns associated with the use of lead ammunition when taking Oregon's wildlife. To remove the Commission's experienced authority regarding this issue would be detrimental to the process of addressing a serious neurotoxicant in an effort to protect wildlife, the environment, and human health within our state.

For the foregoing reasons, I urge you to vote NO on H.B. 2503. Thank you for your time and consideration.

Lead-Free Wildlife: Fact Sheet

Protect Oregon's wildlife, humans and the environment from toxic lead contamination

Lead is a potent neurotoxin that is unsafe for humans, wildlife and the environment. Lead ammunition needlessly exposes humans and other animals to this life-threatening poison.

The Centers for Disease Control states there is no safe level of lead exposure.[i] Lead has been removed from various paints, gasolines, pipes and a host of other items to protect human health and our environment.

Lead-based ammunition is considered the greatest source of lead knowingly discharged to our lands and water.[ii] It poses significant health risks to animals, including humans, and can have serious implications for the environment.[iii]

Threat to wildlife: More than 130 species—including humans—have been documented to be exposed to or killed by ingesting lead shot, bullet fragments or prey contaminated with spent lead ammunition.[iv]

Animals can fall victim to spent lead ammunition through two avenues:

- **Primary poisoning**, in which an animal ingests spent ammunition directly from the environment, usually when foraging for food on the ground; and
- **Secondary poisoning**, in which an animal consumes wounded or dead prey or scavenges gut piles contaminated with lead ammunition left behind by hunters.

The toxic effects of lead ammunition are poisoning Oregon's wildlife. In 2014, the Audubon Society of Portland reported that raptors and scavengers from around the state admitted to veterinary clinics are showing elevated blood lead levels at times of the year that correlate with big game and coyote hunting seasons.

X-ray images from state wildlife agencies have shown that lead from hunting ammunition is contaminating common food sources for scavenging wildlife, including gut piles and carcasses, which put them at serious risk for lead poisoning and in many cases death.

Both avenues are often lethal to wildlife. For those who survive, poisoned animals often experience long-term negative effects that make them more susceptible to predation and dangers, such as car collisions. Fortunately, lead poisoning from spent ammunition is preventable with proper management and regulation.

Lead ammunition is toxic: A single ingested shotgun pellet or bullet fragment is sufficient to cause brain damage in birds, resulting in inhibition of critical neuromuscular, auditory, and visual responses.[v] Lead poisoning can induce lethargy, blindness, paralysis of lungs and intestinal tract, various organ failure, seizure, and death in wild animals.

Dove hunting and lead shot: Since doves are small and have an erratic flight path, it often takes an average of 5-8 shots to hit the animal.[vi] According to USFWS, an estimated 15-20 million mourning doves are harvested annually.[vii] If every hunter is shooting with lead, this would equate to roughly 5.2-7 million pounds of lead dispersed into the environment ever year.[viii]

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Threat to human health: Lead is a potent neurotoxicant, for which no safe level of exposure has been identified.[ix] Individuals who consume meat from animals killed with lead ammunition are at risk for lead exposure.[x] Several studies using x-ray imaging have shown that lead ammunition is highly fragmentable and nearly impossible to completely remove from meat.[xixii]

X-ray of a mule deer neck shows more than 450 lead bullet fragments.

Effective alternatives are available: Alternative ammuniton is widely available and effecitve. For shot, the U.S. Fish & Wildlife Service (USFWS) has approved a dozen nontoxic shot types. Steel, copper and bismuth are among the most common non-lead materials and are readily available at major outfitters. With the increase in supply, the price of non-lead shot has fallen since lead shot was federally banned for waterfowl hunting in 1991. Non-lead bullets are also available and ammunition manufacturers are already increasing production in response to California's 2013 landmark decision to become the first state to require non-lead ammunition for the take of any wildlife statewide.[xiii] Indeed, a survey conducted by the Arizona Game and Fish Department revealed that nearly 80% of hunters rated the performance of non-toxic ammunition to be better than or equivalent to its lead counterpart.[xiv]

Ammunition regulations are effective: The mandated use of non-toxic ammunition has proven to be an extremely effective management approach to lead poisoning. In 1991, the USFWS required the use of non-lead shot for the hunting of waterfowl nationwide. Within just six years, researchers found significant improvements in the blood and bone lead levels in a variety of waterfowl species.[xv] The use of nontoxic shot reduced the mortality of Mallards by 64%, and generated a national saving of approximately 1.4 million ducks in a single fall flight.[xvi]

"[By switching to non-lead ammunition for hunting] it forces us to 'put our money where our mouth is' – to not only say we are good stewards for our resources for future generations of hunters (and non-hunters), but to act consistently with that claim."

~ Rene Tatro, Oregonian and lifelong hunter written in support of non-lead hunting ammunition requirements (Oregonlive.com, July 3, 2014)

Restrictions are commonplace: Thirty-four states have increased restrictions on lead ammunition beyond the 1991 federal waterfowl regulation.[xvii] As a result of its success, the National Park Service announced in 2009 they would begin eliminating the use of lead ammunition; and the U.S. Army has invested resources and intelligence toward creating—and switching—to non-toxic ammunition, citing environmental and animal welfare concerns.[xviii] Most recently, California enacted legislation in 2013 that will phase in a non-lead ammunition requirement for all hunting statewide.

Science is clear: Scientists resoundingly agree that spent lead ammunition poses a significant risk to human health and wildlife. More than 500 scientific papers published since 1898 have cited the many dangers caused by lead exposure from spent ammunition. And in 2013, a strong scientist consensus was released in support of eliminating the introduction of lead ammunition into the environment, signed by thirty leading national and international experts.[xix] Toxicologists, veterinarians, pathologists, physicians, epidemiologists, biologists, and other experts have advised against the use of lead in ammunition due to its toxic effects.

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Lead Poisoning of Bald (*Haliaeetus leucocephalus*) and Golden (*Aquila chrysaetos*) Eagles in the US Inland Pacific Northwest Region—An 18-year Retrospective Study: 1991–2008

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Lead Poisoning of Bald (*Haliaeetus leucocephalus*) and Golden (*Aquila chrysaetos*) Eagles in the US Inland Pacific Northwest Region—An 18-year Retrospective Study: 1991–2008

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Abstract: To determine risk factors and seasonal trends of lead poisoning in bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles, blood lead levels were evaluated in eagles admitted from the inland Pacific Northwest region of the United States to the Raptor Rehabilitation Program, College of Veterinary Medicine at Washington State University from 1991 to 2008. Admissions were from Washington (32 bald eagles, 27 golden eagles), northern Idaho (21 bald eagles, 25 golden eagles), northeastern Oregon (5 bald eagles, 6 golden eagles), Montana (2 bald eagles), Alaska (1 bald eagle), and unrecorded (6 bald eagles, 5 golden eagles). In these birds, 48% (22/46) of bald and 62% (31/50) of golden eagles tested had blood lead levels considered toxic by current standards. Of the bald and golden eagles with toxic lead levels, 91% (20/22) and 58% (18/31) respectively, were admitted after the end of the general deer and elk hunting seasons in December. Coyote hunting intensifies with the end of the large game hunting seasons and coyote carcasses left in the field and contaminated with lead bullet fragments become readily available food sources, exposing scavenging bald and golden eagles to high risk of acute lead poisoning.

Key words: lead poisoning, coyote, bullet fragmentation, hunting ammunition, blood lead levels, inland Pacific Northwest, avian, bald eagle, *Haliaeetus leucocephalus*, golden eagle, *Aquila chrysaetos*, California condor, *Gymnogyps californianus*

Introduction

Lead poisoning from ingestion of hunting bullet fragments by avian scavengers such as bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), and California condors (*Gymnogyps californianus*) in many regions of the United States is of great concern to raptor biologists as well as to state and federal wildlife agencies.[1–7] It is widely accepted, with strong supporting evidence, that large game animals shot but not retrieved or lead-contaminated game animal offal discarded by hunters is a major and continuing source of lead poisoning in nontarget wildlife species.[3,5,7,8]

The purpose of this report is to provide information on seasonal trends and risk factors associated with lead poisoning in eagles as it relates to big game fall hunting seasons and winter shooting of coyotes in the inland Pacific Northwest region of the United States. Here we present data spanning an 18-year (1991–2008) retrospective study of lead poisoning in bald and golden eagles admitted to the Raptor Rehabilitation Program, Washington State University, College of Veterinary Medicine, Pullman, WA, from eastern Washington, northern Idaho, northeastern Oregon, western Montana, and Alaska.

Materials and Methods

Source of animals and sample collection

For several decades the Washington State University Raptor Rehabilitation Program has

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Figure 1. Immature (top) and adult (bottom) golden eagles with lead poisoning. Blood lead levels were 2.9 ppm (290 μg/dL; 14.1 μmol/L) and 0.87 ppm (87 μg/dL; 4.22 μmol/L) respectively. Clenched toes, inability to stand, and profound depression are evident. Both eagles were admitted to the Raptor Rehabilitation Program, Washington State University, in January from widely separated locations.

accepted injured and sick raptors from the US inland Pacific Northwest—which comprises eastern Washington, northern Idaho, northeastern Oregon, and western Montana—with the primary goal of rehabilitating and releasing them back into the wild. From 1991 to 1997, the policy was to test only eagles with clinical signs suggestive of lead poisoning (eg, depression, paralysis, or weakness of legs or wings) but no other clinical abnormalities (eg, gunshot wounds, electrical burns, trauma) (Figs 1 and 2). In 1998, we decided to screen all eagles admitted to the Raptor Rehabilitation Program for blood lead concentrations. From 1991 to 1997, 21 bald and 20 golden eagles were admitted; 6 and 11 birds, respectively, were tested. From 1998 to 2008, 46 bald and 43 golden eagles were admitted; 40 and 39 birds, respectively, were tested.

We radiographed all eagles to screen for metallic objects (lead) in the gastrointestinal tracts and obtained 3 rifle-shot coyote carcasses from a taxidermist to demonstrate bullet fragmentation and fragment dispersion by fluoroscopy.

Toxicologic testing

Determination of lead concentrations in fresh blood samples was done by the Analytical Sciences Laboratory, University of Idaho, Moscow, ID, USA.

We recorded 4 categories of blood lead levels by state, species, and quarter of year admitted. Blood lead levels of <0.2 ppm (<20 μg/dL; <0.97 μmol/L) were considered to be background and of no clinical significance; levels between 0.2 and 0.5 ppm (20–50 μg/dL; 0.97–2.43 μmol/L) were diagnosed as subclinical; levels between 0.51 and 1.00 ppm (51–100 μg/dL; 2.47–4.85 μmol/L) were classified as clinical lead poisoning; levels >1.00 ppm (>100 μg/dL; >4.85 μmol/L) were classified as severe clinical poisoning with recovery after treatment rare. Background and subclinical blood lead levels indicate chronic exposure whereas clinical and severe clinical poisoning indicate acute exposure.[1,2]

Data collection and statistical analysis

We identified all eagle admissions between 1991 and 2008 from case files of the Raptor Rehabil-

Figure 2. Mature bald eagle with lead poisoning admitted to the Raptor Rehabilitation Program, Washington State University, in February. The blood lead level was 2.3 ppm (230 μg/dL; 11.2 μmol/L). Fixed stare, unkempt feathers, and depression are pronounced.

itation Program and entered information from each record into a computer spreadsheet (Excel, Microsoft Inc, Redmond, WA, USA). Descriptive statistics and chi-square analysis were performed with Statistix 7.0 (Analytical Software, Tallahassee, FL, USA). Cases missing a value for a particular comparison were omitted from that analysis but were otherwise included.

Results

In the period from 1991 to 1997, the Raptor Rehabilitation Program admitted 21 bald and 20 golden eagles, and from 1998 to 2008, 46 bald and 43 golden eagles. Of these, 46 bald and 50 golden eagles were tested for blood lead levels. Eagles with toxic blood lead levels came from Washington (11 bald eagles, 18 golden eagles), northern Idaho (7 bald eagles, 11 golden eagles), northeastern Oregon (2 bald eagles, 2 golden eagles), Alaska (1 bald eagle), and unknown origin (1 bald eagle) (Figs 3 and 4).

Before the testing policy change, a higher proportion of golden eagles tended to have toxic blood lead levels than bald eagles (Fisher exact test, $P = .11$) but after the policy change the proportions were similar ($P = .65$) (Table 1). Of the eagles with background blood lead levels (<0.20 ppm; <20 μg/dL; <0.97 μmol/L) currently considered inconsequential, 6 bald and 10 golden eagles had blood lead concentrations ranging from 0.10 to 0.19 ppm (10–19 μg/dL; 0.48–0.92 μmol/L).

The admission of bald and golden eagles to the Raptor Rehabilitation Program was strongly seasonal (Fig 5). Of the bald eagles, 36 (54%) were admitted in the first quarter, (January–March), 14 (21%) in the second (April–June), 9 (13%) in the third (July–September), and 8 (12%) in the fourth (October–December). Of the golden eagles, 28 (44%) were admitted in the first, 5 (8%) in the second, 14 (22%) in the third, and 16 (25%) in the fourth quarter. Significantly more bald than golden eagles were admitted during the first 2 quarters than the last 2 ($P = .03$). Of the 22 bald eagles with subclinical, clinical, or severe clinical blood lead levels (n = 12, 3, and 7, respectively), 20 (91%) were admitted January–March; of the 31 golden eagles with subclinical, clinical, and severe clinical blood lead levels (n = 15, 5, and 11, respectively), 18 (58%) were admitted January–March and 10 (32%) October–December. For the 40 tested bald eagles admitted after the testing policy change, admission in the first quarter was significantly associated with toxic blood lead levels ($P = .03$) but the associations were not significant for the 39 golden eagles tested ($P = .08$).

None of the eagles had radiographic evidence of ingested lead particles in their gastrointestinal tracts.

Lead fragments numbering into the hundreds of pieces in 1 of 3 rifle-shot coyote carcasses to less than 10 pieces in another carcass were visualized by fluoroscopy. Lead fragments were

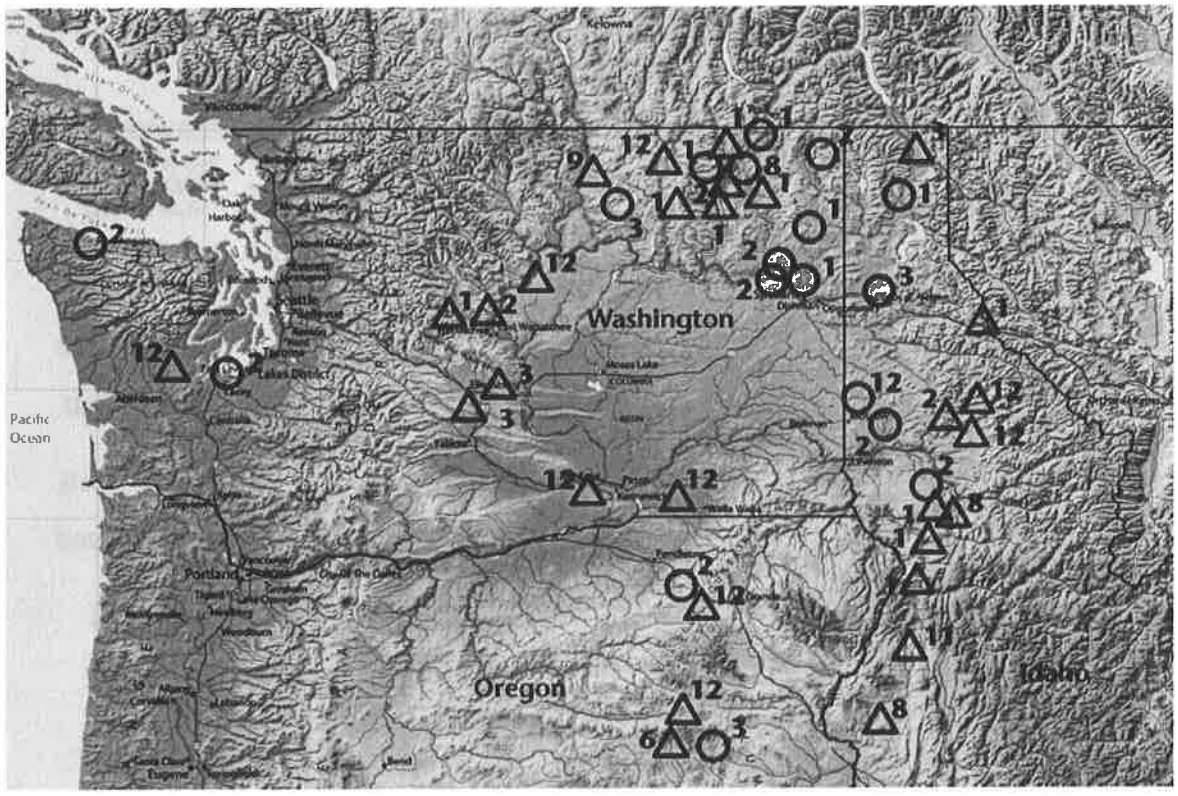

Figure 3. Known locations of bald and golden eagles from Washington, Idaho, and Oregon with lead poisoning submitted to the Washington State University Raptor Rehabilitation Program, 1991–2008. Circles indicate bald eagles; triangles, golden eagles; and numbers, month of hospital admittance.

widely distributed in the chest and abdominal cavities without obvious skeletal impact by the bullet (Fig 6).

Discussion

Lead poisoning in bald and golden eagles and other scavengers continues to be a major problem over wide regions of the United States.[1–4] To understand the risk factors, extent, and seasonality of lead poisoning in eagles in the US inland Pacific Northwest region, we undertook an 18-year retrospective study (1991–2008) of bald and golden eagles admitted to the Washington State University Raptor Rehabilitation Program. In the first 7 years (1991–1997) only eagles with clinical signs of lead poisoning (depression, paralysis, weakness of legs or wings) but without evidence of physical injuries were tested for blood lead levels. From 1998–2008, blood lead levels of all eagles admitted were determined whenever possible.

Our findings agree with others that lead poisoning of eagles is a major problem during the elk and deer hunting seasons from October to December.[4–8] Additionally our data document that the risk of lead poisoning of eagles extends beyond the big game hunting seasons into the first quarter of the following year. The small number of eagles tested from 1991 to 1997 (6 of 21 bald and 11 of 20 golden eagles) gave the impression that golden eagles (9 of 11) were at higher risk for lead poisoning than bald eagles (2 of 6). It also appeared that most cases of lead poisoning in bald (2 of 2) and golden eagles (8 of 9) occurred in the first quarter of the year. Extending the testing to all eagles admitted after 1998 gave us a clearer picture of the quarterly prevalence of lead poisoning in bald and golden eagles and allowed us to draw conclusions about the seasonal occurrence and differences between the 2 species.

Our documentation of the seasonal prevalence (October–March) of blood lead levels consistent with lead poisoning suggests that ingestion of ammunition lead is the major source. The temporal clustering of bald eagles (20 of 22, 91%) and the continued high prevalence of golden eagles (18 of 31, 58%) with toxic blood lead levels after the end

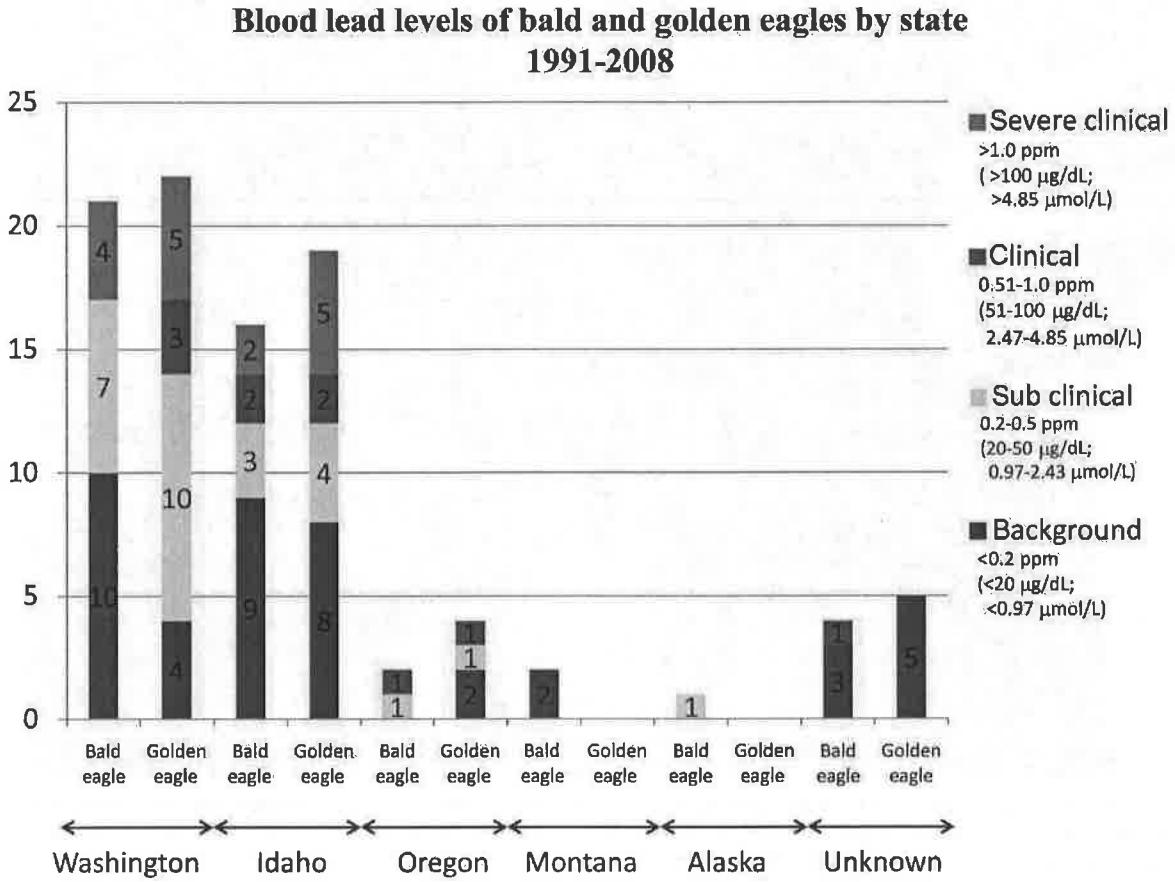

Figure 4. Blood lead levels in bald and golden eagles admitted to the Washington State University Raptor Rehabilitation Program, 1991–2008, by state.

of the big game hunting seasons specifically points to the importance of shot coyotes in eagle poisoning from January to March.

Although golden eagles are common throughout the region year round, bald eagles are not regularly seen far from water until bodies of water freeze. This forces bald eagles from a predominantly fish and waterfowl diet to forage over terrestrial habitat where rifle-shot coyotes become a ready food source. It is unlikely that elk and deer remains, covered by winter snow, are important sources of lead for this time of year.

Table 1. Blood lead levels of bald eagles and golden eagles admitted to the Washington State University Raptor Rehabilitation Program, 1991–1997 and 1998–2008.

	1991–1997		1998–2008	
	Bald eagles	Golden eagles	Bald eagles	Golden eagles
Birds admitted	21	20	46	43
Birds tested	6	11	40	39
Lead level[a]				
Background	4 (66%)	2 (18%)	20 (50%)	17 (44%)
Subclinical	2 (33%)	4 (36%)	10 (25%)	11 (28%)
Clinical	–	1 (10%)	3 (8%)	4 (10%)
Severe clinical	–	4 (36%)	7 (17%)	7 (18%)

[a] Background = <0.2 ppm (20 µg/dL; 0.97 µmol/L); subclinical = 0.2–0.5 ppm (20–50 µg/dL; 0.97–2.43 µmol/L); clinical = 0.51–1.0 ppm (51–100 µg/dL; 2.47–4.85 µmol/L); severe clinical = >1.0 ppm (>100 µg/dL; >4.85 µmol/L).

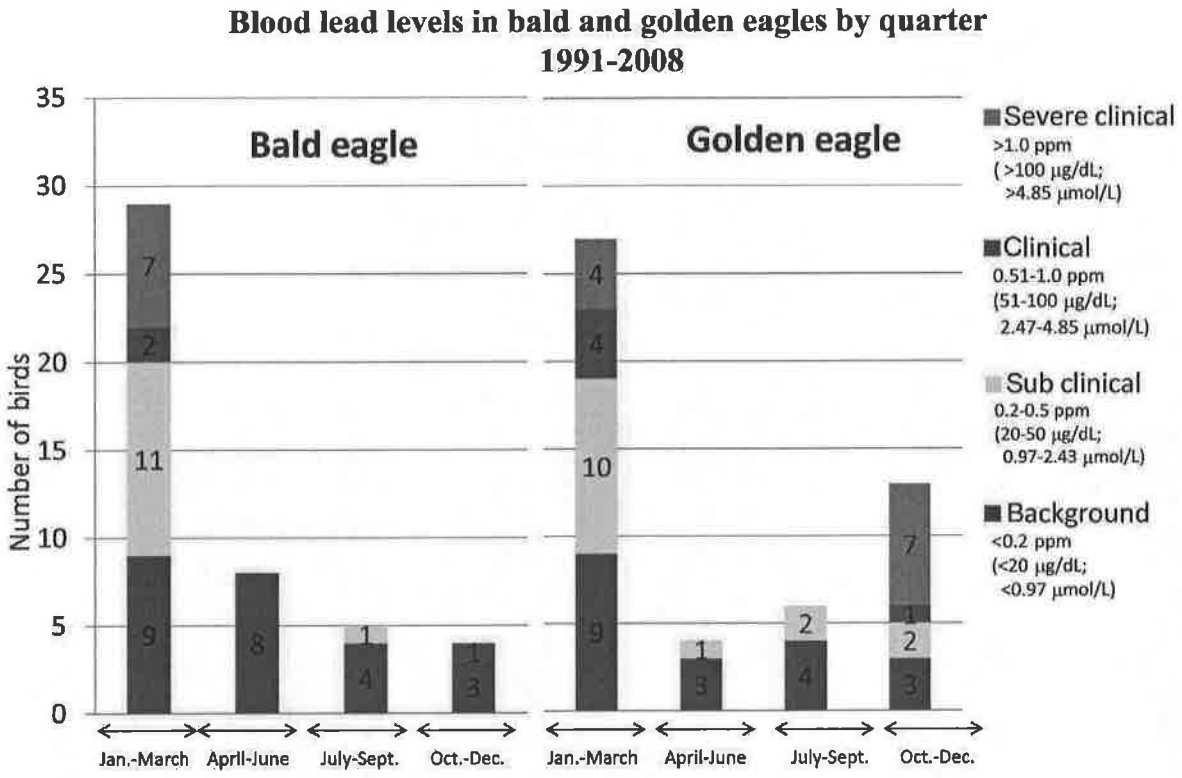

Figure 5. Blood lead levels in bald and golden eagles admitted to the Washington State University Raptor Rehabilitation Program, 1991–2008, by annual quarter.

After December, when big game hunting ends, the shooting of coyotes intensifies. Less caution on the part of coyotes during the mating season, combined with greater visibility for hunters when snow covers the ground and hunters' habit of shooting coyotes from motorized vehicles, make them easy targets for predator hunters. (W. Westberg, oral communication, February 2008; L. Tompkins, written communication, March 2008; T. Grimm, C. Hickey, written communication, November 2008; M. Flamm, written communication, February 2009).

Personal observations of shot coyotes left in open fields and fed on by eagles as well as statements by ranchers who observe eagles feeding on winter-shot coyote carcasses support the view that coyote shooting contributes to lead poisoning of eagles during this time period. Additional risks for lead poisoning in eagles arise as the snow melts and rodents emerge from hibernation and are shot for recreational purposes.[6,9] One biologist from Montana reported seeing 19 bald eagles on the ground in a pasture near their roosting place where 1.5 hours previously men had been shooting ground squirrels. (G. Pampush, written communication, March 2008.)

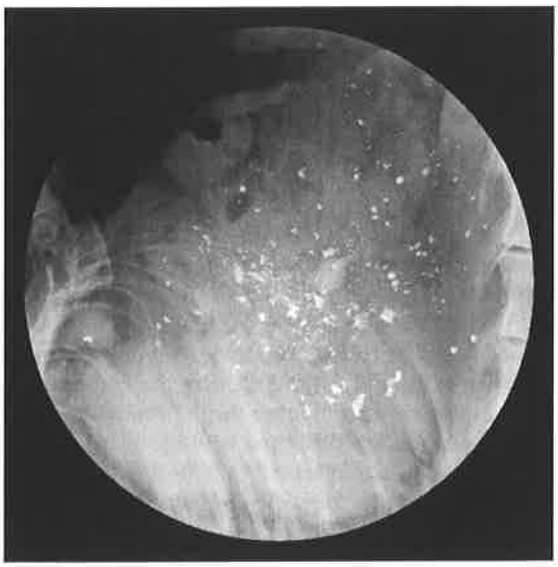

Figure 6. Visible lead fragments in carcass of rifle-shot coyote scanned by fluoroscopy. Note the extensive fragmentation without visible impact on bone.

Figure 7. Carcass of an adult female golden eagle pointed to by a hunting dog in the sagebrush desert in central Washington in mid-January. Lead analysis of tissues were 4.8 ppm (480 μg/dL; 23.3 μmol/L) (wet weight) for liver, 1.8 ppm (180 μg/dL; 8.7 μmol/L) (wet weight) for kidneys, and 28.0 ppm (2800 μg/dL; 135.8 μmol/L) (dry weight) for bone, indicating severe clinical poisoning.[11] Photo courtesy of Steve deJong.

The risk of lead poisoning for scavenging eagles depends on the amount of lead in animal remains or carcasses. With game, the sources of lead are either shot animals not retrieved or, more commonly, tissues (ie, entrails, heart, lungs, liver, blood-shot meat) discarded by hunters after field dressing. Lead contamination of those tissues can be expected because bullets expand widely along wound channels to a diameter of 40 cm around the bullet path, and fragments become embedded in tissues not kept for human use.[8,10] Animals shot with varmint bullets designed to fully disintegrate in their target without leaving the body, as seen in the radiograph of the rifle-shot coyote carcass with extensive bullet fragmentation and dispersal, undoubtedly pose a much greater risk of lead poisoning because the entire carcass is available for consumption.[11] Lead particles imbedded in the food source are readily ingested by scavengers, resulting in the formation and absorption of lead salts before toxic effects become evident. Ingested lead is rarely seen in the digestive tract by radiography or retrieved from eagles with lead poisoning, but a direct cause-effect relationship in rifle-shot animals and blood lead levels in eagles and California condors has been established by comparisons of lead isotope ranges.[5,7,12]

We believe that eagles admitted to our Raptor Rehabilitation Program represent only a small percentage of lead-exposed birds in the region of our study, which is either unpopulated or sparsely populated. Most eagles suffering from lead poisoning would never be seen or found alive for diagnosis and medical treatment (Fig 7).

Lead has no known biologic functions and safe exposure limits for most species have not been established. Clinical implications of lead poisoning in wild birds with blood levels >0.20 ppm

(>20 μg/dL; >0.97 μmol/L) have been documented and described.[1,2] Effects on the immediate well being of eagles are not expected at background concentrations of 0.10–0.19 ppm (10–19 μg/dL; 0.49–0.92 μmol/L) but emerging information on blood lead concentrations in the range previously considered inconsequential are associated with harmful effects in long-lived species,[13] with possible implications for eagles.

The gravity of lead poisoning in eagles in the US inland Pacific Northwest region is highlighted by the fact that 22 of 46 (48%) bald and 31 of 50 (62%) golden eagles tested had toxic blood lead levels of 0.20 ppm (20 μg/dL; 0.97 μmol/L) or higher. Inclusion of values in the 0.10–0.19 ppm (10–19 μg/dL; 0.49–0.92 μmol/L) range would increase the numbers to 28 of 46 (61%) for bald and 41 of 50 (82%) for golden eagles.

It is disheartening that in a society that prides itself for its love of wildlife in general and for the admiration of (bald) eagles in particular, lead poisoning continues at a level similar to previous decades. As long as hunting with lead-containing bullets is accepted and continues, the problem of lead poisoning will persist.[2,5,13] A small step to reduce the opportunity of lead poisoning in eagles and other wildlife can be taken by hunters in the safe disposal (eg, burial, burning) of lead-contaminated animal parts or "sport-hunted" animals or voluntary lead reduction commitments by hunters.[2,14–16] Testing more moribund or sick eagles for lead poisoning to prove the danger of lead in the environment is not needed; instead, we need to realize that lead must be removed from all hunting ammunition without delay. Lead-free bullets for hunting purposes are readily available.[2,16] Federal and state agencies, the hunting community, and the public must reach agreements on how to most effectively and swiftly make the transition from lead to no-lead ammunition. Countries, states, communities, and private entities with a progressive outlook have taken this important step for protecting nontarget wildlife species but ultimately also for the well-being of their own citizens.[2,14–23]

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The Oregonian

Lead ammunition should be phased out in Oregon: Guest opinion

By Rene Tatro

July 03, 2014 at 11:41 AM, updated July 03, 2014 at 4:53 PM

All Oregonians, including, but not only, hunters, have an interest in – and should have a voice in – the discussion about phasing out lead ammunition in hunting. However, the Oregon Department of Fish and Wildlife's decision to deliver a survey on that issue exclusively to hunters sends an ominous signal: that ODF&W intends to frame the question as one to be decided by and for hunters only, effectively disenfranchising those non-hunters who nonetheless enjoy and cherish our bounty of natural resources. While hunters clearly have a voice that must be heard on this issue, this agency's mission is to protect and enhance our wildlife resources for all Oregonians, as well as future generations.

At a societal level, we have made great strides in eliminating lead from our environment, even though lead was commonly added to things like paint and gasoline. We eliminated lead from those things because we got smarter about it, as its pernicious toxic effects manifested themselves in our children and animals. We didn't use "tradition" or "convenience" as a mantra. We did what was right. There can be no doubt that while lead ammunition has been traditionally used for many years, the time has come to face the reality that the era of lead must come to an end in hunting.

That reality is important for this reason: Bullets and shot fired by hunters remain among the largest sources of lead knowingly discharged into our lands and water. I write not as a fanatic (or even vocal or closet) anti-hunting or "gun control" advocate. In fact, I'm an avid, lifelong hunter and own and use firearms regularly. But the more I read, the more I learned about the threat this usage presents, the more I knew the time had come for me to make the change and to join the effort to bring this discussion to the forefront where it belongs, among all Oregonians.

There is not a lot of room for debate about the threat lead poses – that was settled long ago. A large body of scientific research links lead to a variety of ills that affect nearly every organ in the human body, including the nervous and reproductive systems. Children exposed to lead can experience brain damage, lower IQs, slowed growth and anemia. But we share this great state with millions of silent creatures who are no less affected by lead, with whose stewardship we have been entrusted. Those creatures are poisoned by foraging spent lead shot from the ground, consuming contaminated prey or scavenging gut piles left behind by hunters. Millions of animals are exposed to or killed by ingesting spent lead ammunition every year.

When the U.S. Fish and Wildlife Service phased out lead shot in waterfowl hunting two decades ago, the world as we know it did not come to an end. In fact, I think duck and goose hunting today is better than ever.

Phasing out lead ammunition now for all hunting will not change our hunting world significantly either – there are so many good and viable alternatives to lead for hunting. In fact, I'm proud to say that one of pioneers in this changeover, Hevi-Shot, was started right here in our state. But phasing out lead ammunition for hunting does force us to "put our money where our mouth is" – to not only say we are good stewards of our resources for future generations of hunters (and non-hunters), but to act consistently with that claim.

Rene Tatro, of Wilsonville, is an attorney.

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ASHLAND DAILY TIDINGS

Tests show eagle died of lead poisoning

By Ryan Pfeil
for the Tidings
Posted Feb. 12, 2015 @ 3:41 pm
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GRANTS PASS — The bald eagle that died just over a week after it was found grounded outside Ashland last December died from lead poisoning, Wildlife Images officials confirmed.
Executive Director Dave Siddon said pathology tests performed in Madison, Wis., confirmed the long-suspected diagnosis this week. The bird, named Kringle in honor of the holiday season, was also screened for avian flu and West Nile virus, diagnoses which present similar symptoms.

"You can't treat for lead toxicity until you've positively diagnosed it. The treatment is very tough on the animal," Siddon said.

Ashland Water Treatment Plant supervisor Greg Hunter found Kringle Dec. 9 on the Reeder Reservoir shore south of Ashland. The bird had his head down and would not fly, signs that can indicate lead poisoning. Wildlife Images took Kringle into their care, thinking at first his sluggishness and facial swelling could have been caused by the bird running into something during flight.

"The first symptoms, we thought it was an impact of some sort," Siddon said. "That's the first thing that we were looking for."

During his stay at Wildlife Images, Kringle received a slew of treatments, including anti-fungal medication, antibiotics and steroids. Due to the high risk and unconfirmed diagnosis, lead poisoning treatment was not included.

The bird's health came and went during his time at the facility, Siddon said, bouncing back and forth between improvement and decline over several days. He died sometime before the morning of Thursday, Dec. 18.

Where the lead poisoning stems from is unknown, though Oregon Department of Fish & Wildlife officials say it can come from several sources. Steve Niemela, assistant district wildlife biologist for ODFW, said the most common source is from lead ammunition fragments, which can be ingested by birds of prey scavenging on the discarded remains of hunted animals.

Other less likely possibilities include waste from old mine shafts, older paint or lead sinkers, Niemala said.

Reach reporter Ryan Pfeil at 541-776-4468 or rpfeil@mailtribune.com. Follow him at www.twitter.com/ryanpfeil.

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Health Risks from Lead-Based Ammunition in the Environment

A Consensus Statement of Scientists

March 22, 2013

We, the undersigned, with scientific expertise in lead and environmental health, endorse the overwhelming scientific evidence on the toxic effects of lead on human and wildlife health. In light of this evidence, we support the reduction and eventual elimination of lead released to the environment through the discharge of lead-based ammunition, in order to protect human and environmental health.

1) Lead is one of the most well-studied of all anthropogenic toxins and there is overwhelming scientific evidence that demonstrates:
   a) Lead is toxic to multiple physiological systems in vertebrate organisms, including the central and peripheral nervous, renal, cardiovascular, reproductive, immune, and hematologic systems. Lead is also potentially carcinogenic; lead is officially recognized as a carcinogen and reproductive toxin in California, and the International Agency for Research on Cancer, the National Toxicology Program, and the US Environmental Protection Agency have identified lead as likely to be carcinogenic to humans.
   b) There is no level of lead exposure to children known to be without deleterious effects (CDC, 2012). Exposure in childhood to even slightly elevated levels of lead produce lasting neurological deficits in intelligence and behavior.
   c) Lead is also known to be toxic across different vertebrate organisms, including mammalian and avian species.

2) Lead-based ammunition is likely the greatest, largely unregulated source of lead knowingly discharged into the environment in the United States. In contrast, other significant sources of lead in the environment, such as leaded gasoline, lead-based paint, and lead-based solder, are recognized as harmful and have been significantly reduced or eliminated over the past 50 years.
   a) Lead-based ammunition production is the second largest annual use of lead in the United States, accounting for over 60,000 metric tons consumed in 2012, second only to the consumption of lead in the manufacture of storage batteries (USGS, 2013).
   b) The release of toxic lead into the environment via the discharge of lead-based ammunition is largely unregulated. Other major categories of lead consumption, such as leaded batteries and sheet lead/lead pipes, are regulated in their environmental discharge/disposal.

3) The discharge of lead-based ammunition and accumulation of spent lead-based ammunition in the environment poses significant health risks to humans and wildlife. The best available scientific evidence demonstrates:
   a) The discharge of lead-based ammunition substantially increases environmental lead levels, especially in areas of concentrated shooting activity (USEPA ISA for Lead draft report, 2012).
   b) The discharge of lead-based ammunition is known to pose risks of elevated lead exposure to gun users (NRC, 2012).
   c) Lead-based bullets used to shoot wildlife can fragment into hundreds of small pieces, with a large proportion being sufficiently small to be easily ingested by scavenging animals or incorporated into processed meat for human consumption (Pauli and Burkirk, 2007; Hunt *et al.*, 2009; Knott *et al.*, 2010).

d) Lead-based ammunition is a significant source of lead exposure in humans that ingest wild game (Hanning *et al.*, 2003; Levesque *et al.*, 2003; Johansen *et al.*, 2006; Tsuji *et al.*, 2008), and hunters consuming meat shot with lead-based ammunition have been shown to have lead pellets/fragments in their gastrointestinal tract (Carey, 1977; Reddy, 1985).
e) Lead poisoning from ingestion of spent lead-based ammunition fragments poses a serious and significant threat to California wildlife.
    i. Spent lead-based ammunition is the principal source of lead exposure to the endangered California condor, and lead poisoning in condors is preventing their successful recovery in the wild (Church *et al.*, 2006; Woods *et al.*, 2007; Green *et al.*, 2008; Parish *et al.*, 2009; Rideout *et al.*, 2012; Finkelstein *et al.*, 2012).
    ii. Many other wild scavenging species, such as golden eagles, bald eagles, ravens, turkey vultures, and pumas are known to be exposed to and affected by lead (Wayland and Bollinger, 1999; Clark and Scheuhammer, 2003; Fisher *et al.*, 2006; Craighead and Bedrosian, 2008; Stauber *et al.*, 2010; Kelly and Johnson, 2011; Burco *et al.*, 2012).

Based on overwhelming evidence for the toxic effects of lead in humans and wildlife, even at very low exposure levels, convincing data that the discharge of lead-based ammunition into the environment poses significant risks of lead exposure to humans and wildlife, and the availability of non-lead alternative products for hunting (Thomas, 2013), we support reducing and eventually eliminating the introduction of lead into the environment from lead-based ammunition.

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