BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF ENDORSING THE OREGON ZOO'S EDUCATION, OUTREACH AND RESEARCH EFFORTS TO REDUCE LEAD EXPOSURE IN WILDLIFE AND HUMANS FROM SPENT LEAD AMMUNITION	))))))	RESOLUTION NO. 14-4538 Introduced by Chief Operating Officer Martha J. Bennett, with the concurrence of Council President Tom Hughes

WHEREAS, lead has long been recognized as a human and wildlife health hazard; and

WHEREAS, mortality and morbidity from lead poisoning has been well documented for many birds and mammals including protected species such as bald eagles, golden eagles and California condors; and

WHEREAS, evidence implicating the ingestion of spent lead ammunition as the main source of lead poisoning in wild birds is extensive; and

WHEREAS, California condors will not be sustainable in the wild until exposure to lead from spent ammunition is reduced or eliminated; and

WHEREAS, hunters and the hunting tradition have long been and remain a significant positive force for the conservation of native wildlife and their habitats; and

WHEREAS, hunter support and cooperation in eliminating lead in the environment is likely the single most important contribution to achieving sustained wild condor populations in the Pacific Northwest; and

WHEREAS, education and outreach efforts are the key to successfully reducing the exposure of wildlife to lead from spent ammunition; and

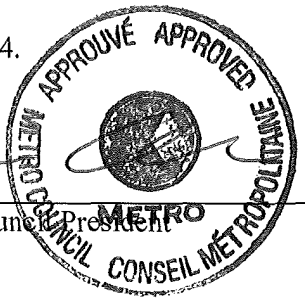
WHEREAS, Metro is the Metropolitan Planning Organization responsible for providing a healthy environment and protecting the region's natural assets; and

WHEREAS, the Zoo and Sustainability Center operate a successful and effective fish and wildlife education program; and

WHEREAS, efforts to date by the Oregon Zoo to provide education and outreach to reduce the exposure of wildlife to lead include: a "Condor Summit" meeting in partnership with the Yurok Tribe in 2010; a workshop on wildlife and lead in partnership with The Wildlife Society in November 2013; interpretive graphics at the new "Condors of the Columbia" exhibit; and funding for research and outreach through Oregon Zoo Foundation (OZF) Future for Wildlife grants; now therefore

BE IT RESOLVED that the Metro Council endorses the Oregon Zoo's efforts to work with partners and stakeholders to conduct outreach, research and education with the goal of reducing the exposure of wildlife to lead from spent ammunition, and directs the Chief Operating Officer to support efforts by the Oregon Zoo to conduct education, outreach and research activities with the goal of advancing our scientific understanding of the issue, educating the community and bringing stakeholders together to reduce the exposure of wildlife and humans to lead from spent ammunition.

ADOPTED by the Metro Council this 31st day of July 2014.



for Tom Hughes, Council President

Approved as to Form:

Alison R. Kean, Metro Attorney

STAFF REPORT

IN CONSIDERATION OF RESOLUTION NO. 14-4538 FOR THE PURPOSE OF ENDORSING THE OREGON ZOO'S EDUCATION, OUTREACH AND RESEARCH EFFORTS TO REDUCE LEAD EXPOSURE IN WILDLIFE AND HUMANS FROM SPENT LEAD AMMUNITION

Date: July 31, 2014

Prepared by: David Shepherdson Ph.D.
(503) 220-5765

BACKGROUND

Lead has long been recognized as a human and wildlife health hazard. In humans lead exposure has been linked to a number of serious health disorders such as high blood pressure, neurological disease, gastrointestinal problems and increased risk of death from heart attack and stroke. Exposure to lead has been documented for wild birds and mammals. Birds however are probably at more risk of lead poisoning because food is ground in the gizzard before passing through the digestive system. In birds lead exposure has been linked to inability to fly, anemia, blindness, seizures, and painful death. The Environmental Protection Agency (EPA) classifies lead as a persistent, bioacumulative and toxic (PBT) chemical. Of particular significance to this resolution, spent lead shot and lead bullets are considered "solid waste" under the Resource Conservation and Recovery Act (RCRA).

Although sometimes present at low levels naturally in the environment, human activities have greatly increased exposure to lead by concentrating it in batteries, pigments, dyes, caulks, paints, metal alloys, fuel additives (it is still used in some aviation fuels), auto wheel balancing weights, fishing tackle and ammunition. In 2013, over 69,000 metric tons of lead was used in the production of ammunition in the United States alone.

Various legislative actions have been taken to reduce human exposure to lead. In 1990 the Clean Air Act was amended to require the elimination of lead in gasoline by 1996. In 1992 Congress enacted the Residential Lead Based paint Reduction Act to ban the manufacture of lead based paint. In 2008 the EPA strengthened the National Ambient Air Quality Standards (NAAQS) for lead limiting emissions to 0.15 micrograms per cubic meter over a 3 month period. In 2000, in response to concerns about health and safety at firing ranges and environmental impacts, the Army launched a "Green Bullet Program" that developed and distributed a "green bullet" for use on the field with a copper rather than lead core. Over thirty million of these ammunition rounds were sent to troops in Afghanistan. In 2006 the National Park Service initiated a policy mandating that only nontoxic ammunition be used for firearms practice, training and qualification. However, the threat to human health from lead ingested from animals killed with lead ammunition has not been addressed. Several studies have demonstrated elevated lead levels in individuals as a consequence of eating meat containing lead ammunition fragments. Subsistence communities that rely on hunting for a major proportion of their diet are believed to be at increased risk of lead poisoning.

Exposure of wildlife to lead can be direct, for example, when birds mistake lead shot for seeds or grit, or indirect when predators or scavengers ingest lead when consuming the flesh of animals that have been shot with lead or that ingested lead sinkers. When lead bullets enter animal flesh they expand or "mushroom," and then fragment, resulting in large numbers of small lead fragments that can travel several inches from the wound channel (fragments are therefore often found in the viscera or "gut pile"). As a consequence of fragmentation, multiple individuals may be exposed from one carcass (e.g. various predators and scavengers feeding on one carcass and its remains over time) and the large surface area of the small fragments facilitates uptake into the blood stream.

Evidence implicating lead ammunition as the main source of lead poisoning in wild birds is extensive and includes; physical evidence (e.g. x-rays and/or surgical removal) of lead particles inside the intestinal tracts of birds diagnosed with high blood lead levels, correlation of stable lead-isotopes between blood/feather and ammunition samples, and spatial and temporal associations between big game hunting and lead exposure in scavenging birds. Condor blood lead levels, for example, have been found to correlate with deer hunting season, and in Arizona and Utah peak blood lead levels are

associated with movement of condors into an area with high hunting pressure. Correlations such as these have also been found for a variety of other species including, turkey vultures and golden eagles, bald eagles and common ravens. Big game carcasses are not the only potential source of lead ammunition to scavenging birds. Other sources include non-game animal hunting, depredation shooting on private and public land, pest control and euthanasia of farm animals in the field. Spent ammunition in and around shooting ranges can also be ingested by wild animals, such as birds and rodents and thus enter the food chain.

The diet and wide-ranging nature of eagles and vultures make them particularly vulnerable to lead exposure. All are obligate scavengers, and are attracted to large carcasses (such as big game). Social birds such as California condors are further at risk, as many birds will feed on one carcass. Mortality and morbidity from lead poisoning has been well documented for bald eagles, golden eagles and California condors. Bald eagles and golden eagles are protected by three federal laws: The Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act. California Condors are protected under the Endangered Species Act and all three are covered under the Lacey Act.

Population level effects due to lead exposure are difficult to assess. While there is concern (and ongoing research) about potential population effects on golden eagles there is no doubt that California condor recovery is in jeopardy due to lead exposure. During the first 17 years (1992-2009) of the reintroduction program, 23 birds died from lead poisoning, making it the single biggest source of mortality (35%). Twenty-two additional deaths occurred between 2010 and 2012, of the 18 birds for which course of death could be established, 15 died of lead poisoning. Adult mortalities have a great impact on the population of a long lived, slowly reproducing species like the California condor. Until mortality from lead poisoning is reduced, the population of wild condors will not be sustainable without supplementation from the captive breeding facilities (Oregon Zoo, San Diego Zoo, Los Angeles Zoo, World Center for Birds of Prey) combined with intensive management of birds in the wild (annual captures, blood lead level assays, chelation treatments for affected individuals, and intensive care for acutely poisoned birds). Due to their sensitivity to lead poisoning and intensive monitoring, Condors can be thought of as excellent sentinels for lead contamination of carcasses throughout their range.

Some diversity of opinion exists on the most effective way to tackle the issue of wildlife lead exposure from spent ammunition. Mostly these fall into approaches that can be characterized as regulatory or voluntary; these approaches are not mutually exclusive.

In 1991, in recognition that loss of waterfowl to lead poisoning was a serious problem, the United States Fish and Wildlife Service (USFWS) implemented a nationwide ban on the use of lead shot for waterfowl hunting. In approximately 38 states the lead shot ban has been expanded to include non-waterfowl shooting (mainly upland bird shooting). In 2008 a complete ban on the use of lead ammunition for hunting (game and non-game) in the condor range was implemented in California and is now required to be phased in statewide by 2019. Although some reductions in lead exposure were found in turkey vultures and golden eagles following the 2008 ban, condor exposure has not yet fallen. Potential reasons include lack of compliance, condor range expansion, and contamination from marine mammal carcasses.

Lack of compliance (and corresponding enforcement) is a major challenge for any regulatory approach and voluntary programs have demonstrated high rates of compliance. A program in Arizona developed by Arizona Game & Fish (and supported by hunter stakeholder groups) that combined education, ammunition exchanges, and incentives for gut pile removal reached compliance levels of >80% and was associated with reduced condor lead exposure. Similar programs are underway in California, notably by the Institute for Wildlife Studies (IWS) and by the Yurok Tribe's "Hunters as Stewards" program. Indeed, the Yurok Tribe has conducted outreach events in SE Oregon in association with Oregon Hunters Association (OHA). They also participated in a workshop at the Oregon Zoo on Wildlife and Lead hosted by the Zoo and The Wildlife Society (TWS) in November 2013.

Regardless of whether a regulatory approach is ultimately adopted, education and outreach efforts will be a key component of success. Such outreach is best done collaboratively with key stakeholders to address concerns, beliefs, needs and key issues. Information is also needed on stakeholder's knowledge and attitudes and Oregon Department of Wildlife (ODFW) recently initiated a survey of hunting license holders to gain some of this information. Since humans are now the top predator in most places and since many wild predator populations have been reduced or eliminated, hunters are key to the survival of most scavengers in the world. Thus the role of hunters in the conservation of these species has never been more important. Conservation is a key aspect of the North American model of hunting. Hunters are therefore a stakeholder of primary importance for the future of wildlife populations and wildlife health.

The Oregon Zoo has supported the California condor program by breeding birds for release since 2004. Since then 28 birds have been contributed to the release program and have been released in California and Arizona. Since 2004 the Zoo has also worked to investigate the feasibility of restoring condors to Oregon. This has included a partnership with the Yurok Tribe, based in Klamath, California. Recently the Yurok Tribe signed an MOU with USFWS, California Department of Parks and Recreation, National Park Service, and Ventana Wildlife Society in support of a test release of condors in N. California. The proximity of potential release sites to the Oregon border makes it likely that a release would result in birds flying into Oregon. As in other areas of the recovery program, providing condors with an environment free of lead exposure will be critical to success. The Oregon Zoo is also concerned about the threat of lead poisoning to golden eagle recovery and the suffering of individuals of other species. Efforts to date by the Oregon Zoo to reduce the exposure of wildlife to lead include; a "Condor Summit" meeting in partnership with the Yurok Tribe in 2010, a workshop on wildlife and lead in partnership with TWS in November 2013, interpretive graphics at the new "Condors of the Columbia" exhibit and funding for research and outreach through Oregon Zoo Foundation (OZF) Future for Wildlife grants.

1. **Known Opposition**
None

2. **Legal Antecedents**
NA

3. **Anticipated Effects**
Adopting resolution 14-4538 will strengthen the Oregon Zoo's ability to conduct education, research and outreach on this issue, engaging partners and stakeholders and raising funding for the continuation and expansion of this important work.

Ultimately, it is intended that this resolution will help with the potential reintroduction of California condors to their former range (including Oregon), increase the chance of golden eagle recovery in the state and reduce the needless and painful deaths of scavenging birds and other animals throughout the state. It can also help to alleviate the potential negative human health effects of lead ingestion from hunted carcasses and generally help reduce lead levels in the environment.

4. **Budget Impacts**
This resolution will have no direct impact on the FY 14-15 budget.

Discussions are in progress with OZF and an external funder to create a position based at the zoo to conduct and coordinate education and outreach activities around this issue in partnership with major stakeholder groups. If and when funding is in place Metro Zoo staff will work with Metro HR to establish the position classification and compensation.

RECOMMENDED ACTION
Recommend approval of Resolution No. 14-4538 by Metro Council with direction to the Chief Operating Officer to support efforts by the Oregon Zoo to conduct education, outreach and research activities with the goal of advancing our scientific understanding of the issue, educating the community and bringing stakeholders together to reduce the exposure of wildlife and humans to lead from spent ammunition.