EWDA supports ECHA's proposal to restrict the use of lead in outdoor shooting and fishing

The European Wildlife Disease Association (EWDA) previously supported the restriction on use of lead shot in wetlands and strongly supports the proposal of the European Chemicals Agency (ECHA) "to restrict the placing on the market and use of lead in projectiles (for firearms and airguns), and in fishing sinkers and lures for outdoor activities".

The EWDA is an international scientific society of wildlife professionals, including veterinarians, epidemiologists, biologists, ecologists, research scientists and other individuals involved with wildlife diseases and related disciplines, promoting research, management, education, communication, consultation, and collaboration. The mission of the EWDA is to acquire, disseminate, and apply knowledge of the health and diseases of wild animals in relation to their biology, conservation, and interactions with humans and domestic animals. Members of the EWDA have been associated with research and publications identifying the severe health impacts of lead in terrestrial and marine wildlife described in ECHA's report.

Lead has acute and chronic detrimental effects on living organisms. The use of lead ammunition and fishing weights, including its deposition in the environment (where it persists and accumulates), results in various health risks all over Europe: primary intoxication of mammals and birds that feed on fish, and birds with grinding gizzards; secondary intoxication of predatory or scavenging species; exposure of humans consuming meat (knowing that any level of lead exposure is potentially health-threatening); and contamination of the environment, including waterways from run-off. Current regulations on lead sinkers and ammunition in terrestrial habitats within Member States of the European Union (EU) vary from near or imminent bans in Denmark to restricted use within wetlands. Several studies (e.g. from UK and Sweden) revealed that a large proportion of hunters are using lead shot to hunt waterfowl, regardless of the ban. This is problematic because the flyways of migratory birds cross several Member States and a lack of consistent and complete regulations throughout the bird habitat range prevents the effective implementation of measures relevant to animal and human health.

Disease management is typically challenging in free-living wildlife populations. Lead intoxication is an exception: a problem that could easily be solved if appropriate regulation existed. Although the impact of lead ammunition, sinkers and lures on wildlife health is sometimes difficult to quantify, it is considered significant. Lead has been proven to have a detrimental impact on wildlife populations not only due to lethal exposure but also as a result of long-term sublethal contamination leading to other diseases and health disorders (e.g. impaired locomotion, vision, reproduction and immunity). Emerging literature on impacts on wild mammals such as bears is concerning – if unsurprising: Scandinavian brown bears for example have lead blood levels 13- 14 times higher than Swedish children and 8 times higher than the threshold for developmental neurotoxicity in humans. Furthermore, the safety of meat originating from hunted wildlife is an issue increasingly recognised as important for public health. Regarding this issue, not only infectious agents but also sublethal toxic compounds (such as lead contained in the tissues of hunted animals) must be taken into consideration. From an economic point of view, in addition to the acute and chronic detrimental effects to living organisms, soil and water contamination, significant efforts and funds are invested in surveillance, research and wildlife rehabilitation related to lead intoxication. Finally, in an era where the importance of sustainable habitats and environmental health to human health is widely recognised, society

increasingly expects a move towards a more respectful way of dealing with the environment, decreasing pollution, and intensified efforts for wildlife conservation.

In view of lead's proven toxicity to wild birds and mammals, domestic animals, and humans; the current inconsistent regulations regarding these lead substances among EU Member States; the current lack of risk management at the EU level; and the availability of alternatives considered to be safe and affordable (e.g., steel, bismuth, tungsten for gunshot, and sinkers and lures made with tin), the EWDA strongly supports ECHA's proposal. We have recently completed our virtual joint conference with the wider Wildlife Disease Association involving 612 participants from 50 countries, presenting 110 papers, 217 posters and 9 plenary speakers. The overwhelming theme was one of the needs for One Health perspectives. The proposal for restriction of the use of lead ammunition and fishing sinkers represents just this approach and is therefore timely and welcomed.

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Annex: selected case reports of lead poisoning incidents in Europe and the world

- **Information on the frequency and extent of lead poisoning observed in terrestrial species of birds, including predatory and scavenging species**

Bellrose (1959) illustrates that wildlife losses due to lead poisoning have been a cause for concern for conservationists since the 1950s. Lack of action will mean continuation of losses as described by this paper.
https://www.ideals.illinois.edu/handle/2142/44086

Pain *et al* (2019) provide a review and update of the most recent effects of lead from ammunition on birds and other wildlife.
https://link.springer.com/article/10.1007/s13280-019-01159-0

Fisher *et al* (2006) present an overview of lead ingestion and poisoning in terrestrial birds from around the world. The use of lead ammunition results in (1) mortality of water birds and terrestrial species through lead poisoning following the ingestion of spent shot; (2) poisoning of raptors, including threatened species, through the ingestion of shot or bullet fragments in the flesh of prey and (3) long-term environmental contamination through the deposition of lead.
https://www.sciencedirect.com/science/article/abs/pii/S0006320706000802

Mateo (2009) provides a comprehensive account of lead poisoning in wild birds in Europe.
https://www.peregrinefund.org/subsites/conference-lead/PDF/0107%20Mateo.pdf

Monclús *et al* (2020) provide extensive information on lead contamination in raptors in Europe from 1983 to 2020. Evidence for high occurrence of lead contamination is reported, especially in scavengers.
https://www.sciencedirect.com/science/article/pii/S0048969720349664

- **Lead ammunition threatens the conservation status of vulnerable species**

Mateo *et al* (2001) and **Rodriguez-Ramos Fernandez *et al* (2011)** provide evidence of lead shot impacts on the endangered Spanish imperial eagle and red kite. Lead shot was found in 11.0% of Spanish imperial eagle and 5.5% of red kite pellets. The Spanish Imperial Eagle is listed as vulnerable on the IUCN red list with only ~650 mature individuals remaining in the world.
http://www.sciencedirect.com/science/article/pii/S0147651300919961
http://www.ncbi.nlm.nih.gov/pubmed/21327487

Madry *et al.* (2015) and **Jenni *et al* (2015)** provide evidence of lead concentration at both lethal and sublethal levels in tissues of golden eagles *Aquila chrysaetos* from the Swiss Alps. The patterns of lead in flight feathers and in bone suggested a repeated sublethal lead intake by the same individual, pointing at an episodic lead uptake through ingestion of lead particles from carcasses or offal left behind by hunters. Investigation of lead isotopes hinted at lead ammunition as a source, too. This constitutes a risk not only to eagles but also to other scavengers, notably to the bearded vulture *Gypaetus barbatus*, for which several high bone lead values have been detected.
Although not considered threatened by IUCN on a global scale, golden eagles have experienced sharp population declines in many parts of their range and have even been extirpated from some areas. The population of the bearded vulture continues to decline and in recent years the species status has been re-assessed as "Near Threatened" by IUCN.
https://iopscience.iop.org/article/10.1088/1748-9326/10/3/034003/meta

https://link.springer.com/article/10.1007/s10336-015-1220-7

Berny *et al* (2015) provide further evidence of the detrimental impact lead ammunition has on the survival rates of vulnerable scavenging bird species (especially vultures).
http://www.sciencedirect.com/science/article/pii/S0147651315001517

Bassi *et al* (2021) provide evidence of 44% of birds of four large scavenging bird species in South-central Europe (including three vulture species) having lead levels exceeding the background thresholds with a suspected impact on demography.
https://www.sciencedirect.com/science/article/abs/pii/S0048969721011979

Descalzo *et al* (2021) provide extensive information about high levels of bird of prey exposures to lead measured from both passive and active surveillance methods including in Spanish imperial eagles (listed by IUCN as Vulnerable).
https://www.sciencedirect.com/science/article/abs/pii/S0048969720357892?via%3Dihub

Gonzalez *et al* (2017) provide information about Griffon vultures from a rehabilitation centre in Spain, which found 26% of the analysed birds presented lead levels above 20 µg/dL.
https://www.sciencedirect.com/science/article/abs/pii/S0147651317302774

Mateo *et al* (2001) studied marbled teal and white-headed duck, two threatened wildfowl species that in Spain suffer high mortality due to lead ammunition. Ingested lead shot was present in 32% of shot stifftails (mainly white-headed ducks) and 70 and 43% of dead or moribund stifftails and marbled teal, respectively. As these species feed predominantly in wetlands they will ultimately be protected by the wetland restriction on lead shot, even though their habitats will be contaminated with historical lead shot for decades to come.
http://www.ncbi.nlm.nih.gov/pubmed/11764172

- **Lead shot exposure**

Pain *et al* (2015) provide estimates of the numbers of water birds, game birds and birds of prey that die in the UK due to lead poisoning. Broad, but conservative, estimates put the figure at 50,000-100,000 for wildfowl per winter (c. 1.5-3.0% of the wintering population). For gamebirds the figure is likely to be hundreds of thousands, 600,000 are estimated to have ingested lead shot at any one time in a hunting season. Birds of prey are more difficult to assess, but there is evidence from the United States and Europe that birds of prey are also affected as they scavenge prey that contain embedded lead shot.
http://www.oxfordleadsymposium.info/wp-content/uploads/OLS_proceedings/papers/OLS_proceedings_pain_cromie_green.pdf

- **Lead ammunition negatively impacts animal welfare**

Sainsbury *et al* (1995) indicate that there are associated welfare implications of lead ammunition derived lead poisoning; it is a disease that causes distress and severe pain for weeks if not months to hundreds of thousands of birds a year in the UK (see Pain *et al*, 2015 above). The absence of a ban perpetuates this suffering.
http://docserver.ingentaconnect.com/deliver/connect/ufaw/09627286/v4n3/s4.pdf?expires=1468839684&id=88193043&titleid=75000207&accname=University+of+Bristol+Library&checksum=F2239051B00FA9D3E366D1A82BC69A2E

- **Population impacts of lead poisoning**

Meyer *et al* (2016) show evidence of population impacts for some waterbirds and large raptors but in general there has been a dearth of studies on the population level impacts of lead poisoning on terrestrial birds. The demand for this evidence gap means this is likely to change in the next few years. Meyer used population models to show that lead shot ingestion reduced red partridge population size by 10% and in red kite the annual growth rate was reduced from 6.5% to 4%.
https://www.ncbi.nlm.nih.gov/pubmed/?term=Meyer+2016+lead+partridge

- **Lead ammunition ban effects**

Mateo *et al* (2014) demonstrate that banning lead ammunition leads to reductions in lead poisoning mortalities in birds (Pb shot ingestion decreased from 30.2% to 15.5%) and lead exposure in game-eating humans (hunted birds with only embedded Pb shot (no steel) declined from 26.9% to <2%). Without a ban these reductions are unlikely to occur.
http://www.ncbi.nlm.nih.gov/pubmed/24309467

- **The hidden threat from embedded lead ammunition**

Berny and Vey (2017) studied birds of prey in rehabilitation or other clinical settings and found blood lead levels of birds with embedded lead projectiles were significantly higher (224.2 µg/L, 95% confidence interval 197.0–251.4 µg/L) than those without (142.9 µg/L, 95% confidence interval 124.1–161.7 µg/L). The authors suggests that embedded lead projectiles may release lead and induce some long-term detrimental effects.
https://link.springer.com/article/10.1007/s10344-017-1160-z

- **Impact of lead on immunology of birds**

Vallverdu-Coll et al (2019) provide a good review of the immunotoxic effects of lead on birds and find immunodepressing effects at low levels of exposure particularly in developing birds (>10 µg/dL).
https://doi.org/10.1016/j.scitotenv.2019.06.251

- **Wild mammals as receptors of lead**

Fuchs et al (2021) document that Scandinavia brown bears are highly exposed to environmental lead and that the exposure is population wide. Bears have blood Pb levels that are 13-14 times higher than Swedish children and 8 times higher than the threshold for developmental neurotoxicity in humans.
https://www.sciencedirect.com/science/article/pii/S0269749121011775