

UK REACH: Restriction Proposals 004 - Lead shot in ammunition

Link response to HSE consultation

November 2022

[Wildlife and Countryside Link](#) (Link) is the largest nature coalition in England, bringing together 67 organisations to use their joint voice for the protection of animals and the natural world.

General comments

We welcome this consultation on proposed restrictions for 'lead shot in ammunition' under the UK REACH process.

We are supportive of the approach taken and the restrictions proposed. The restrictions will be effective at reducing the significant risks from lead ammunition use that have been identified, can be practically applied due to the growing alternatives to lead ammunition products and can be readily monitored due to the clarity that outright bans bring.

Our response to the consultation includes:

- Evidence showing the effectiveness, affordability and current widespread use of lead-free cartridges in game shooting – and the galvanising effect the restriction will have on growing these supplies.
- Strong disagreement that a derogation for the use of lead shot in target shooting is required. Such a measure would cause avoidable welfare and ecological harm for no good reason, while undermining the proposed restrictions.
- Recommendations to address omissions in the impact assessment which undercount the benefits of the restrictions.

Response to consultation questions

Quantities

Please provide your best estimate of the number of lead free shot cartridges and bullets sold per year in GB:

Shot cartridges - hunting

A 2015 paper by Vernon Thomas of the University of Guelph records that, in 2014, less than 6% of cartridges produced by UK manufacturer Gamebore were made from alternatives to lead.¹

¹ http://www.oxfordleadsymposium.info/wp-content/uploads/OLS_proceedings/papers/OLS_proceedings_thomas.pdf

Research² carried out by Link and WWT for the Lead Ammunition All Party Parliamentary Group (APPG)³ suggested that in August 2022 over 20% of Gamebore cartridges sold by Just Cartridges were made from lead-free shot, implying a much a higher rate of production from the manufacturer compared to 2015.

The same analysis, drawn from data collected from online retailers, suggests that the wider availability of lead-free cartridges aligns with this increase. At the start of the 2022 game shooting season, 21.6% of cartridges products from GB manufacturers sold by the leading online retailer of game cartridges were lead-free.

Projectiles made from alternatives

Please provide information on the technical and economic feasibility of potential alternatives for the following:

Shot cartridges

Product performance

The European Chemicals Agency (ECHA) have assessed the effectiveness of lead-free cartridges, concluding that "In recent years, several companies have created non-toxic shot from bismuth, tungsten, or other elements or alloys with a density similar to or greater than lead, and with a shot softness that results in ballistic properties that are comparable to lead."⁴

This conclusion is supported by a range of studies into the effectiveness of steel, the most common alternative to lead shot. A 2014 double-blind comparative study of the effectiveness of steel and lead shot for shooting doves (Pierce et al) concluded that "Hunters were unable to distinguish the ammunition type being used in the field, and we detected no relationship between ammunition type and level of hunter satisfaction. Field analyses detected no difference in doves bagged per shot, wounded per shot, bagged per hit, or wounded per hit among the 3 ammunition types."⁵

A further study (Ellis & Miller, 2022) has found that crippling rate (birds wounded but not killed outright) declined from 23% with lead shot to an average of 13% with steel.⁶

The question of gamebird shot lethality was also considered in a British Association for Shooting and Conservation (BASC) commissioned Cranfield University study (2020) which concluded: "The relative lethality of steel shot versus lead used in shotgun cartridges has indicated that, when fired into a target

² <https://leadammunitionappg.org/wp-content/uploads/2022/09/Alternatives-to-lead-shot-Assessing-supply-and-demand.pdf>

³ <https://leadammunitionappg.org/>

⁴ <https://echa.europa.eu/documents/10162/1a42c9e1-e36a-65b0-da45-bc1ca093b632>

⁵ https://www.researchgate.net/publication/268988767_A_comparison_of_lead_and_steel_shot_loads_for_harvesting_mourning_doves_Mourning_Dove_Ammo_Comparison

⁶ <https://onlinelibrary.wiley.com/doi/10.1002/wlb3.01001>

mimicking the physiology of a pheasant, there is little difference in pellet penetration when using recommended shot sizes.”⁷

Following on from these studies, guidance on using lead-free cartridges effectively has been issued by shooting organisations to their members. As reported in the BASC guide to moving away from lead shot, 92% of those attending BASC’s Sustainable Ammunition Workshops had no concerns about using steel once they had tried it. 97% said they would be confident using steel for quarry or clay shooting.

As also reported by BASC:

“In Denmark, the Netherlands and Flanders, where the use of lead shot is illegal, those who shoot report no problems with effectiveness. In these areas more than 95% of those who shoot use steel shot.”⁸

Shooters, in the UK and abroad, find steel shot to be an effective alternative to lead.

Price differences between lead-containing products and alternatives

The research carried out for the Lead Ammunition APPG by Link & WWT found that, in August 2022², the majority of lead-free cartridges on sale from online retailers in Great Britain were made from steel. Cartridge prices across different online retailers were consistent, with steel and lead ammunition priced at very similar levels (with steel being slightly cheaper), and bismuth and other alternatives priced more expensively.

As suggested by the founder of one of the largest online retailers (Charles Bull of Just Cartridges) in April 2022, steel will continue to be “the market leader” due to its affordable cost, with new steel products “coming on stream from all the UK manufacturers”.⁹

Number of affected products

As set out above, the low cost of steel as an effective lead alternative to lead shot means that going completely lead free should have minimal financial impacts for game shotgun shooting.

One area of possible disruption involves the oldest of antique guns. Whilst many antique guns can be adapted to cope with steel ammunition¹⁰, and affordable non-toxic shot products are coming on-stream specifically made for older guns which are not adapted¹¹, some Damascus barrelled guns manufactured before the 1880s may be unsuitable for steel use. For these guns, softer non-toxic ammunitions are available, albeit at a higher cost.

This small price detriment for a minority of shotgun owners (who may well also own a suitable shotgun for steel use) should be put into the proper context – in the words of a 2021 BASC opinion piece:

⁷ <https://basc.org.uk/lead-vs-steel-a-question-of-lethality/>

⁸ <https://basc.org.uk/lead/guide-to-using-non-lead-shot/>

⁹ <https://shoothub.gunsonpegs.com/articles/shoot-owners/lead-free-shot-what-shoots-need-to-know>

¹⁰ <https://www.shootinguk.co.uk/guns/ammunition/steel-shot-in-old-shotguns-126432>

¹¹ See for example: <https://www.eleyhawk ltd.com/game-load/grand-prix-traditional-steel-pro-eco>

“Steel is currently the most widely available and cheapest alternative to lead. For many shooters, it is a perfectly good replacement... At the same time, those with a special attachment to an older gun won't have to break the bank to get a box of bismuth or tungsten matrix for the odd special occasion.”¹²

It is important to also highlight that, in these rare circumstances, the price of lead-free cartridges not made from steel will make up a very small proportion of the budget of the game shooter using a Damascus barrelled gun. The price of a day's shooting at a commercial estate typically started at around £2,000 per gun in the 2022 season.¹³ In this context, an annual cost of a couple of hundred pounds extra for non-steel, lead-free shot cartridges for the hunter choosing to use a Damascus barrelled gun is unlikely to be a deciding factor in whether or not to shoot.

Development and implementation of the new products

Since regulations on lead shot were first introduced in England in 1999, GB manufacturers have made significant advances in the development and availability of lead-free cartridges. As set out above, this progress has accelerated over the past two years. A combination of decisions by successive retailers not to stock lead-shot game¹⁴, the voluntary phase out announced by shooting organisations in 2020¹⁵, innovation from manufacturers and the prospect of further regulation have resulted in accelerating growth in the availability of alternatives to lead.

The final factor is likely to be decisive in further widening the availability of lead-free shot.

As a 2019 paper¹⁶ by Kanstrup & Thomas argues, the decisive impact of regulation on demand has already been demonstrated in countries where strict lead shot restrictions have been announced. The paper draws on the European retail market to demonstrate the step-change in availability of non-toxic shot that regulation achieves. The paper studied availability of lead-free cartridges in 29 European countries, finding an average of two brands of lead-free cartridges available in each country. Denmark and the Netherlands, the only two European countries where lead shot was completely prohibited, were clear exceptions, with 16 and 4 brands available, respectively.

The paper concludes that:

“The demand for non-lead products will be stimulated by any intergovernmental initiatives to regulate lead ammunition for hunting and target shooting, especially when such initiatives are accomplished through well-enforced national regulation.”

¹² <https://basc.org.uk/what-does-the-transition-away-from-lead-mean-for-young-shots/>

¹³ See for example: <https://www.dawnay.co.uk/sporting/prices-availability/>

¹⁴ <https://www.theguardian.com/business/2019/jul/29/experts-call-for-ban-on-lead-shot-as-waitrose-overhauls-sale-of-game>

¹⁵ <https://basc.org.uk/a-joint-statement-on-the-future-of-shotgun-ammunition-for-live-quarry-shooting/>

¹⁶ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6675809/>

The confirmation of the lead restrictions proposed by UK REACH should have a galvanising effect on the availability of lead-free cartridges, building on the considerable advances in availability achieved over the past two years.

The Link & WWT analysis for the Lead Ammunition APPG considered any possible threats to this fast-growing availability of lead-free cartridges. The analysis concluded that there is no evidence that the war in Ukraine or fluctuations in international steel prices are inhibiting the upward trajectory of supply for lead-free cartridges in GB. The analysis also highlighted that the low price of steel shot, which is currently cheaper than lead shot, provides some headroom for manufacturers to pass on any unforeseen increased costs associated with scaling up steel cartridge manufacture onto consumers.

Risk management measures - lead shot cartridges

Buy-back scheme: We welcome your comments on how a scheme such as this could be operated and how effective it could be.

As set out above, there is currently a good supply of lead-free cartridges available to UK shooters. This supply looks set to continue to grow over the coming years. Assuming UK REACH restrictions are confirmed in summer 2023 and the 18-month timeline for phase out is adhered to, the restriction on lead shot use will only come into force at the end of 2024. By this stage, coinciding with the end of the voluntary phase out announced by shooting organisations in 2020, we can expect supplies of lead-free cartridges to be abundant and for shooters to be very familiar with their use.

As such a buy-back scheme for lead shot cartridges is not necessary, as the timelines for transition are already long enough to allow for abundant supplies of lead-free products to be available at the time the restriction comes into force. A 'buy-back' scheme would be more useful as a measure to help with the 18 month transition.

Potential optional derogation for licenced sites, licenced athletes and licenced suppliers

The Agency is considering a potential optional derogation for licenced athletes to purchase lead shot from licenced suppliers for use at licenced shooting ranges that have adequate risk management measures in place to limit lead releases

We do not support the potential derogation.

The associated application of a five-year transition period for all lead shot would extend the harmful impacts of poisoning from lead shot use into at least 2028, inflicting avoidable death and suffering on thousands of animals and making the legal target to halt the decline in species abundance in 2030 harder to reach (see more below).

Once the extended transition period ends, the licensing scheme proposed under the derogation for lead shot use on shooting ranges will undermine the practicality of the entire restriction. There will be no practical system to distinguish at the point of sale whether a lead shot cartridge will be used for hunting (banned) or on a shooting range (permitted under the derogation), opening up a clear route

for the restriction to be flouted and for the adverse impacts of lead shot use in game shooting to continue.

The core proposal of an 18 month phase out for all lead shot use is a simpler, more practical and more enforceable approach, which should be adhered to.

The shorter transition period should act as a spur for reform and innovation in the target shooting community, which the Government should support by formally requesting sports shooting bodies to change their rules to end the artificially created dependence on lead-shot in some target shooting.

This artificial dependence on lead shot for some forms of target shooting causes environmental harm, which must be addressed. Over 70% of UK ranges are outdoor, meaning that the bulk of the lead ammunition used has the potential to make its way into the wider environment. Measures to prevent lead ammunition from outdoor ranges from leaching into the wider environment can be ineffective, with German research finding that 137 ranges in Lower Saxony were contaminated with 2,722 tonnes of lead.¹⁷ Most clay shooting takes place in open countryside, causing direct lead pollution and harming the animals that come into contact with it.

The derogation and associated extended transition will inflict avoidable animal welfare and ecological harms and undermine the wider restriction, in the interests of preserving an unnecessary target shooting status quo which itself causes considerable environmental harm.

Impact assessment

Current uptake of lead alternatives Hunting - Shot cartridges: Please provide an estimate of the proportion of individuals who have already moved across to lead free alternatives for shot cartridges.

As reported above, analysis of 2022 retail figures by Link & WWT suggests that over 20% of shot cartridge products on sale online from leading GB manufacturers at the start of the 2022 shooting season were lead-free.

This figure cannot be precisely mapped onto use by shooters, as a cartridge product being on sale is not proof that it was definitely bought and used by a shooter, however it provides a broad indication for the 2022 season. Studies of game birds shot in the 2020 and 21 seasons (Pain, Green et al)¹⁸ suggests that use of lead-free shot was considerably lower in previous years, suggesting that the prospect of imminent regulation (in the form of the UK REACH proposals announced in May 2022) has significantly helped the transition to lead-free shot. The impact of education and guidance from shooting

¹⁷<https://wedocs.unep.org/bitstream/handle/20.500.11822/17413/Excerpt%20Lead%20ammunition.pdf?sequence=1&isAllowed=y>

¹⁸ See <https://conservationevidencejournal.com/reference/pdf/8858> & https://www.researchgate.net/publication/358811413_Effectiveness_of_actions_intended_to_achieve_a_voluntary_transition_from_the_use_of_lead_to_non-lead_shotgun_ammunition_for_hunting_in_Britain

organisations committed to the voluntary phase out announced in 2020, along with new products from manufacturers, is also likely to be having an accruing impact.

This picture of initial reluctance to switch from lead, changed by increased awareness of the effectiveness and affordability of lead-free products and then transformed by the prospect of imminent restriction, is a credible one, mirroring the precedent provided by Denmark. Denmark banned lead shot in 1996, with a ban on all lead ammunition due to come into place in 2024.

A study by Kanstrup of hunter attitudes in Denmark towards lead free shot following the announcements of plans for restrictions found that:

"Hunters were initially negative towards the change. Resistance was driven by concern about the quality, safety issues, and expensive cost of non-toxic alternatives, compounded by lack of organizational leadership and tensions between stakeholders. As a result of the widening appreciation of the environmental effects of dispersed lead shot and the introduction of new generations of alternative shot types, hunter attitudes became positive and constructive."¹⁹

The change in attitudes, hastened by further restrictions, has successfully driven a transition away from lead in Denmark, whilst maintaining the numbers of people involved in shooting. As Kanstrup reports, the number of hunters in Denmark is the highest since registration was introduced in the 1930s. The implementation of restrictions in GB look set to have a similar effect.

Additional comments

Are there any additional comments you have concerning the Impact Assessment and/or the costs and benefits that underpin it?

Full animal welfare and ecological impacts

Detailed assessment of the welfare impacts of sub-lethal effects of lead pollution, and of the ecological impact of animal ill health and mortality, are both missing from the impact assessment.

Pain, Cromie, & Green's 2015 paper²⁰ 'Poisoning of birds and other wildlife from ammunition-derived lead in the UK' estimates that 50,000-100,000 wildfowl in the UK (c. 1.5-3.0% of the wintering population) are likely to die during the shooting season as a direct result of lead poisoning, with gamebird mortality occurring at a similar scale. The paper suggests that many more wildfowl and gamebirds evade death but still suffer from significant sub-lethal effects including weakened immune systems.²¹ These sub-lethal affects include reduced muscle function and paralysis, impaired immune function and reproduction, and increase susceptibility to disease, starvation, predation and death from other sources. The harms can pass up the food chain, to effect predators and scavenger birds.

¹⁹ <https://link.springer.com/article/10.1007/s13280-018-1125-9>

²⁰ http://www.oxfordleadsymposium.info/wp-content/uploads/OLS_proceedings/papers/OLS_proceedings_pain_cromie_green.pdf

²¹ <https://www.sciencedirect.com/science/article/abs/pii/S026974912036317X?via%3Dihub>

The RSPCA admits a large number of wild animals in its wildlife centres. Between January 2007 and September 2021, the RSPCA admitted 341 swans with suspected lead poisoning.²² These ‘tip of the iceberg’ figures from just one species indicates the scale of sub-lethal effects from lead poisoning. The suffering and indirect mortality caused by these sub-lethal effects are not addressed in the impact assessment, a significant omission.

The ill health, indirect and direct mortality amongst wild species arising from lead poisoning is of such a scale as to inhibit the delivery of the Government’s Environment Act target to halt the decline in UK species abundance by 2030.²³ The decline in UK bird populations²⁴ is unlikely to be halted as long as 50-100,000 wildfowl alone per year die from lead poisoning. The recovery seen in mute swan populations following the restriction of lead fishing weights provides a case study in how differing levels of lead pollution can impact on the viability of whole species.²⁵ These ecological impacts, and their effect on the achievability of legally set targets, should be addressed in more detail in the impact assessment.

The welfare and health impacts of lead pollution on companion and farmed animals are also omitted from consideration in the impact assessment, which focusses on wild animals. Domestic dogs (and likely domestic cats) are at potential risk of lead exposures in their food if fed game shot with lead²⁶, leading to avoidable suffering from lead poisoning. Scavenging on game bird carcasses by both domestic cats and dogs may lead to similar outcomes. The amount of UK land under active game shoot management (around 2 million hectares, nearly 10% of total UK land²⁷) means that environmental lead poisoning may affect free roaming farmed animals, especially poultry²⁸. This also opens up a further route for a poison to enter the human food chain.

The restrictions proposed by UK REACH would help address the animal welfare and ecological impacts of poisoning arising from lead ammunition use. The omission of these full impacts from the assessment therefore skews the cost-benefit analysis by undercounting the welfare and ecological benefits of the restrictions.

Costs

The outlets through which lead-shot game can be sold in the UK are dwindling. In 2019 Waitrose announced an end to sales of lead-shot game in its supermarkets, a move since followed by other stores including Marks & Spencer. In a particularly significant move the National Game Dealers Association²⁹,

²² Figures provided by RSPCA

²³ <https://www.gov.uk/government/news/landmark-environment-bill-strengthened-to-halt-biodiversity-loss-by-2030>

²⁴ <https://www.bto.org/our-science/publications/developing-bird-indicators>

²⁵ <https://swansg.org/2019/10/18/mute-swan-population-recovery-following-the-regulation-of-lead-angling-weights-in-great-britain/>

²⁶ https://www.researchgate.net/publication/305639837_Lead_intoxication_in_dogs_Risk_assessment_of_feddling_dogs_trimmings_of_lead-shot_game

²⁷ <https://basc.org.uk/shooting-worth-2-billion-to-the-uk-economy/>

²⁸ <https://pubmed.ncbi.nlm.nih.gov/24277920/>

²⁹ <https://www.britishgameassurance.co.uk/ngda-statement-on-lead-free-ammunition/>

which is responsible for a significant proportion of the game sold in the UK, committed in 2021 to ensuring that all their game would be sourced from lead-free chains by 1st July 2022. The Countryside Alliance responding to the NGDA announcement by acknowledging that *“the continued use of lead shot has become a growing obstacle for the game market”*.³⁰

By the time any restrictions are progressed, lead-shot game will be difficult to sell, both in the UK and in the EU (due to the further restrictions now being progressed across all member states³¹). This is not fully reflected in the impact assessment, which as a result over-estimates the cost impacts of the UK REACH restriction proposals.

For questions or further information please contact:

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This response is supported by the following Link members:

RSPCA

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³⁰ <https://www.countryside-alliance.org/news/2021/4/tim-bonner-game-dealers-put-2022-deadline-on-lead>

³¹ <https://www.endseurope.com/article/1706391/echa-puts-forward-full-ban-lead-ammunition>