Committee for Risk Assessment (RAC)

Committee for Socio-economic Analysis (SEAC)

Opinion

on an Annex XV dossier proposing restrictions on

Lead and its compounds

ECHA/RAC/RES-O-0000007115-80-01/F

ECHA/SEAC/[reference code to be added after the adoption of the SEAC opinion]

Agreed

3 June 2022

OPINION ON AN ANNEX XV DOSSIER PROPOSING RESTRICTIONS ON LEAD IN OUTDOOR SHOOTING AND FISHING

2 June 2022

ECHA/RAC/RES-O-0000007115-80-01/F

3 June 2022

[reference code to be added after the adoption of the SEAC opinion]

Opinion of the Committee for Risk Assessment

and

Opinion of the Committee for Socio-economic Analysis

on an Annex XV dossier proposing restrictions of the manufacture, placing on the market or use of a substance within the EU

Having regard to Regulation (EC) No 1907/2006 of the European Parliament and of the Council 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (the REACH Regulation), and in particular the definition of a restriction in Article 3(31) and Title VIII thereof, the Committee for Risk Assessment (RAC) has adopted an opinion in accordance with Article 70 of the REACH Regulation and the Committee for Socio-economic Analysis (SEAC) has adopted an opinion in accordance with Article 71 of the REACH Regulation on the proposal for restriction of

Chemical name(s): **Lead and its compounds**

EC No.: **-**

CAS No.: **-**

This document presents the opinion agreed by SEAC and the Committee's justification for their opinions. The Background Document, as a supportive document to both RAC and SEAC opinions and their justification, gives the details of the Dossier Submitters proposal amended for further information obtained during the consultation and other relevant information resulting from the opinion making process.

PROCESS FOR ADOPTION OF THE OPINIONS

ECHA has submitted a proposal for a restriction together with the justification and background information documented in an Annex XV dossier. The Annex XV report conforming to the requirements of Annex XV of the REACH Regulation was made publicly available at https://echa.europa.eu/restrictions-under-consideration/-/substance-rev/61901/term on 24 March 2021. Interested parties were invited to submit comments and contributions by 24 September 2021.

ADOPTION OF THE OPINION

ADOPTION OF THE OPINION OF RAC:

Rapporteur, appointed by RAC: Tiina SANTONEN

Co-rapporteur, appointed by RAC: Bert-Ove LUND

OPINION ON AN ANNEX XV DOSSIER PROPOSING RESTRICTIONS ON LEAD IN OUTDOOR SHOOTING AND FISHING

The opinion of RAC as to whether the suggested restrictions are appropriate in reducing the risk to human health and/or the environment was adopted in accordance with Article 70 of the REACH Regulation on **2 June 2022**.

The opinion takes into account the comments of interested parties provided in accordance with Article 69(6) of the REACH Regulation.

The opinion of RAC was adopted **by consensus**.

ADOPTION OF THE OPINION OF SEAC

Rapporteur, appointed by SEAC: Karen THIELE

Co-rapporteur, appointed by SEAC: Aart ROUW

The draft opinion of SEAC

The draft opinion of SEAC on the proposed restriction and on its related socio-economic impact has been agreed in accordance with Article 71(1) of the REACH Regulation on **3 June 2022.**

The draft opinion takes into account the comments from the interested parties provided in accordance with Article 69(6)(a) of the REACH Regulation.

The draft opinion takes into account the socio-economic analysis, or information which can contribute to one, received from the interested parties provided in accordance with Article 69(6)(b) of the REACH Regulation.

The draft opinion was published at https://echa.europa.eu/restrictions-under-consideration/-/substance-rev/61901/term on **29 June 2022**. Interested parties were invited to submit comments on the draft opinion by **29 August 2022**.

The opinion of SEAC

The opinion of SEAC on the proposed restriction and on its related socio-economic impact was adopted in accordance with Article 71(1) and (2) of the REACH Regulation on **[date of adoption of the opinion]**. **[**The deadline for the opinion of SEAC was in accordance with Article 71(3) of the REACH Regulation extended by **[number of days]** by the ECHA decision **[number and date]]**[1].

[The opinion takes into account the comments of interested parties provided in accordance with Article[s 69(6) and][5] 71(1) of the REACH Regulation.**] [**No comments were received from interested parties during the consultation in accordance with Article[s 69(6) and][3] 71(1)**]**[6].

The opinion of SEAC was adopted **by [consensus.][a simple majority]** of all members having the right to vote. [The minority position[s], including their grounds, are made available in a separate document which has been published at the same time as the opinion**.]**[6].

[1] Delete the unnecessary part(s)

Contents

Tables

Figures

1. OPINION OF RAC AND SEAC

The restriction proposed by the Dossier Submitter is:

Table 1: Proposed restriction

Substance identity	Conditions of the restriction
Lead and its compounds	1. Shall not be placed on the market in a concentration equal or greater than 1 % w/w: a. in fishing sinkers and lures b. in fishing wires c. in gunshot 2. Shall not be used, in a concentration equal or greater than 1 % w/w: a. in fishing sinkers and lures for fishing b. in fishing wires for fishing c. in gunshot for hunting d. in gunshot for sports shooting e. in any other projectiles not defined as a gunshot for hunting (by way of derogation shall not be used in a concentration equal to or greater than 3 % w/w in copper or copper alloys – this derogation shall be subject to a review prior to entry into force to determine if a concentration less than 1 % can be achieved) f. in any other projectiles not defined as a gunshot for sports shooting (by way of derogation shall not be used in a concentration equal to or greater than 3 % w/w in copper or copper alloys – this derogation shall be subject to a review prior to entry into force to determine if a concentration less than 1 % can be achieved) 3. Shall not be used for fishing, in a concentration equal to or greater than 1 % w/w, in fishing sinkers where the fishing equipment, rig or technique deliberately releases the sinker during use. 4. By way of derogation: *a. [OPTIONAL DEROGATION (part 1 of 4): Paragraph 1c shall not apply if:* *- the retailer places lead gunshot on the market only for users licensed by Member States.* *b. [OPTIONAL DEROGATION (part 2 of 4): Paragraph 2d shall not apply if:* *- the user has a licence, granted by the Member State, to use lead gunshot for sports shooting; AND from EiF + [5] years the use takes place at a location that has a permit granted by the Member State for the use of lead gunshot for sports shooting; AND*

- *the following measures are in place:*
    - *Regular (at least once a year) lead gunshot recovery with >90 % effectiveness (calculated based on mass balance of lead used vs lead recovered in the previous year) to be achieved by appropriate means (such as walls and/or nets and/or surface coverage);*
    - *Containment, monitoring and, where necessary, treatment of drainage water from projectile impact areas (including surface water run-off) to ensure compliance with the environmental quality standard (EQS) for lead specified under the Water Framework Directive;*
    - *Ban of any agricultural use within site boundary;*
    - *Records of compliance with these conditions shall be maintained by permitted locations and shall be made available to enforcement authorities on request.*

c. Paragraph 2e shall not apply to:

- Seal hunting if the user is permitted by the Member State to hunt seals
- Full metal jacket bullets where the Member State allows the use of these bullets [on the date that the restriction proposal was submitted]

d. Paragraph 2f shall not apply if:

- The use takes place inside a building
- The use takes place at a notified (to the Member State) outdoor location for sports shooting; AND no agricultural activities take place at that location; AND
- From EiF + [5] years the following measures are in place:
    - lead projectile containment and recovery via [trap chamber or a 'best practice' sand trap comprising a sand trap with:
        - a water impermeable barrier between the base of the sand trap and the underlying soil;
        - an overhanging roof or a permanent cover;
        - containment, monitoring and, where necessary, treatment of drainage water from projectile impact areas (including surface water run-off) to ensure compliance with the environmental quality standard (EQS) for lead specified under the Water Framework Directive)].
    - Records of compliance with these conditions shall be maintained by notified locations and shall be made available to enforcement authorities on request.

5. Without prejudice to the application of other community provisions on the

classification, packaging and labelling of substances, mixtures, and articles:

a. Retailers of gunshot, 'projectiles not defined as a gunshot', fishing sinkers and lures of any dimension or weight, and containing lead in concentrations equal to or greater than 0.3 % w/w, shall ensure that, at the point of sale, in close proximity to the retailed lead projectiles, fishing sinkers and lures, the following information is clearly and visibly provided to consumers and professionals:

   - '***WARNING****: this product contains lead which is toxic to the environment and may damage fertility or the unborn child. The use of lead in this type of product will be subject to restrictions in the EU from [EiF+TP as specified in paragraph 7]. More information, including ono the availability of lead-free alternatives, is available from [www.echa.europa.eu]'*.

   The information listed above shall be in the official language(s) of the Member State(s) where the products are placed on the market unless the Member State(s) concerned provide(s) otherwise.

b. Suppliers of 'projectiles not defined as a gunshot' containing lead in concentrations equal to or greater than 0.3 % w/w, shall ensure, before the placing on the market, that product packaging is clearly, visibly and indelibly labelled with the information listed in paragraph 5a.

   The labelling shall be in the official language(s) of the Member State(s) where the products are placed on the market unless the Member State(s) concerned provide(s) otherwise. If the packaging is too small, and the information listed in paragraph 5a cannot be provided on the packaging, this information can be provided in fold-out labels (leaflet) or on tie-on tags.

c. [OPTIONAL DEROGATION (part 3 of 4): Suppliers of 'gunshot' containing lead in concentrations equal to or greater than 0.3 % w/w, shall ensure, before the placing on the market, that product packaging is clearly, visibly and indelibly labelled with the information listed in paragraph 5a. In addition, individual cartridges shall be labelled:

   - *'Contains lead: do not use for hunting'*

   The labelling shall be in the official language(s) of the Member State(s) where the products are placed on the market unless the Member State(s) concerned provide(s) otherwise. If the packaging is too small, and the information listed in paragraph 5a cannot be provided on the packaging, this information can be provided in fold-out labels (leaflet); or on tie-on tags.]

6. [OPTIONAL DEROGATION (part 4 of 4): Member States shall report on an annual basis to the Commission:

   - *the number of permits granted to locations in the Member State under paragraph 4b and their location.*
   - *the number of licences granted to users in the Member State under paragraph 4b.*
   - *the quantity of lead gunshot used in the Member State under*

paragraph 4b.]

7. Entry into force of the restriction:
   a. paragraph 1a and 2a shall apply 3 years from entry into force of the restriction for sinkers and lures which have a weight equal or less than 50 g.
   b. paragraph 1a and 2a shall apply 5 years from entry into force of the restriction for all sinkers and lures which have a weight greater than 50 g.
   c. paragraph 1b, 2b and 3 shall apply as soon as possible from entry into force of the restriction.
   d. paragraph 1c, 2c and 2d shall apply [5 years] from entry into force of the restriction.
   e. paragraph 2e shall apply [18 months] from entry into force of the restriction for centrefire ammunition with a calibre greater than or equal to 5.6 mm.
   f. paragraph 2e shall apply [5 years] from entry into force of the restriction for ammunition not included in paragraph 7e, subject to a review prior to the entry into effect.
   g. paragraph 2f shall apply 18 months from entry into force of the restriction.
   h. paragraph 5a shall apply 6 months from entry into force of the restriction.
   i. paragraph 5b shall apply 18 months from entry into force of the restriction.
   j. [paragraph 5c shall apply 5 years from entry into force of the restriction.]

8. This restriction on lead in outdoor shooting and fishing shall not apply to the following uses: indoor shooting inside a building, police, law enforcement, military applications, protection of critical infrastructure, commercial shipping or high-value convoys, soft-target and public space protection, self-defence, security purposes, technical testing and/or proofing, testing and development of materials and products for ballistic protection, forensic analysis, historical and other technical research or investigation (i.e., these uses are not associated with the identified risks and are therefore intended to be outside of the scope).

9. For the purposes of this restriction:
   - 'centrefire ammunition' means ammunition where the primer is located in the centre of the case head or base.
   - 'fishing wire' means metal in the form of thin thread often cut in smaller pieces and used as a sinker in certain types of 'lures'.
   - 'gunshot' means the pellets used [or intended for use in quantity] as projectiles in a single charge or cartridge for shooting with a shotgun;

	it does not include the case, base, primer, wad, propellant etc. - 'hunting' means pursuing and killing live quarry using a projectile expelled from a gun. - 'lure' means an object that is used to attract fish or animals, so that they can be caught. Lures might also have the same technical function as 'sinkers'. - 'projectile' means an object intended to be expelled from a gun, irrespective of the means of propulsion, excluding wads. - 'sand trap' means a mass of sand, or similar material, contained within a concrete or other structure which is open towards the firing point intended to capture and retain fired projectiles. - 'shotgun' means a smooth bore gun. - 'sinker' means a weight that is attached to a fishing line or a net to keep it under the water, or to keep the fishing line, or net, in a certain position. - 'sports shooting' means shooting at any inanimate (non-living) target with a gun. It includes practice, or other shooting, performed in preparation for 'hunting'. - 'trap chamber' means a fully enclosed structure that is isolated from the underlying ground, with the exception of an opening towards the firing point, that is used to capture and retain fired projectiles. Trap chambers can be constructed of various materials but are typically made of metal. 10. Member States may maintain national provisions for protection of the environment or human health in force on [EiF] and restricting lead in gunshot, projectiles other than gunshot or in fishing sinkers and lures more severely than provided for in paragraph 1 to 8. The Member State shall communicate the text of those national provisions to the Commission without delay. The Commission shall make publicly available without delay any such texts of national provisions received.

Note: The original restriction proposal has been revised by the Dossier Submitter based on comments received in the consultation and the version above is thus the revised proposal that this opinion is referring to.

1.1. THE OPINION OF RAC

See RAC opinion.

1.2. THE OPINION OF SEAC

SEAC has formulated its opinion on the proposed restriction based on an evaluation of the information related to socio-economic impacts documented in the Annex XV report and submitted by interested parties as well as other available information as recorded in the Background Document. SEAC considers that the proposed restriction on **lead and its compounds** is the most appropriate Union-wide measure to address the identified risks, as concluded by RAC, taking into account the proportionality of its socio-economic benefits to its socio-economic costs provided that the scope or conditions are modified, as proposed by RAC or SEAC, as demonstrated in the justification supporting this opinion.

The conditions of the restriction proposed by SEAC are:

Table 2: Restriction proposed by SEAC

Substance identity	**Conditions of the restriction**
Lead and its compounds	Entry as proposed by the Dossier Submitter above, with the following modifications (modifications in **bold red** text): 4. By way of derogation: *a. [OPTIONAL CONDITIONAL DEROGATION (part 1 of 4): Paragraph 1c shall not apply **for shot sizes between [1.9 and 2.6 mm]** if* (…) *b. [OPTIONAL CONDITIONAL DEROGATION (part 2 of 4): Paragraph 2d shall not apply **for shot sizes between [1.9 and 2.6 mm]** if:* (…) 5. Without prejudice to the application of other community provisions on the classification, packaging and labelling of substances, mixtures, and articles: a. Retailers of gunshot, 'projectiles not defined as a gunshot', fishing sinkers and lures of any dimension or weight, and containing lead in concentrations equal to or greater than **1** % w/w **(3 % by way of derogation in copper or copper alloys for projectiles not defined as gunshot – this derogation shall be subject to a review prior to entry into force to determine if a concentration less than 1 % can be achieved)**, shall ensure that, at the point of sale, in close proximity to the retailed lead projectiles, fishing sinkers and lures, the following information is clearly and visibly provided to consumers and professionals: (…) b. Suppliers of 'projectiles not defined as a gunshot' containing lead in concentrations equal to or greater than **1** % w/w **(3 % by way of derogation in copper or copper alloys – this derogation shall be subject to a review prior to entry into force to determine if a concentration less than 1 % can be achieved)**, shall ensure, before the placing on the market, that product packaging is clearly, visibly and indelibly labelled with the information listed in paragraph 5a. (…) *c. [OPTIONAL DEROGATION (part 3 of 4): Suppliers of 'gunshot'*

	*containing lead in concentrations equal to or greater than **1** % w/w shall ensure, before the placing on the market, that product packaging is clearly, visibly and indelibly labelled with the information listed in paragraph 5a. In addition, individual cartridges shall be labelled:* (…) 7. Entry into force of the restriction: d. paragraph 1c~~, 2c~~ and 2d shall apply [5 years] from entry into force of the restriction. **k. paragraph 2c shall apply [18 months] from entry into force of the restriction.**

2. SUMMARY OF PROPOSAL AND OPINION

2.1. Summary of proposal

The proposed restriction aims at addressing the risks for human health and the environment posed by the use of lead in ammunition, i.e. gunshot used in terrains[2] other than wetlands and projectiles other than gunshot (i.e. bullets and airgun pellets) used both in wetlands and in terrains other than wetlands, as well as of lead in fishing tackle, as per the request of the Commission (EU Commission, 2019)[3]. This restriction proposal is complementary to the existing restriction on the use of lead gunshot in wetlands (Entry 63 of Annex XVII to REACH).

Ingestion of lead objects by birds (including lead projectiles, fishing sinkers and lures) results in a range of acute and chronic toxicological effects which can lead to death, dependent on the quantity of lead ingested and the size of the animal. Numerous studies have reported incidences of the ingestion of lead projectiles and fishing tackle. The hazards of lead, as well as its bioavailability and absorption are generally well understood and documented for the environment.

Lead gunshot, and the remnants from other lead projectiles (e.g. bullets), that remain in the environment after use become available to be ingested by birds or other wildlife or they can contaminate the soil and water. Lead fishing tackle is also frequently lost during use and affects birds in the same way as lead gunshot and projectiles if ingested. In addition, some contemporary fishing practices, and some fishing tackle suppliers, encourage the deliberate release of lead sinkers to the aquatic environment in some circumstances (termed as 'dropping the lead') to ensure a better catch rate.

The use of lead ammunition and fishing tackle remains widespread in Europe despite its well documented hazard properties for both wildlife and human health. Approximately 44 000 tonnes of lead are dispersed in the environment every year: 57% from sports shooting, 32% from hunting and the rest from fishing activities. Assuming current releases, and if no further regulatory action was taken, approximately 876 000 tonnes of lead would be released to the environment over the next 20 years.

Numerous studies have reported the ingestion of lead projectiles and fishing tackle by wildlife, including wildlife whose habitat is outside of wetland areas (e.g. terrestrial bird species). The principal routes by which animals are exposed to lead from ammunition or fishing tackle are:

- **primary ingestion** defined for the purpose of the Background Document as the ingestion of any lead object *directly* from the environment, e.g. after mistaking it for food or grit (which is deliberately ingested to aid the processing of food);

- **secondary ingestion** defined for the purpose of the Background Document as the *indirect* ingestion of lead that occurs after the consumption of lead-containing food, e.g.

    - ingestion of embedded fragments/particles of lead that are present in the tissues of prey or carrion,

[2] In the context of this restriction, the word "terrain" should be interpreted as land.

[3] https://www.echa.europa.eu/documents/10162/13641/rest_lead_ammunition_COM_request_en.pdf/f607c957-807a-3b7c-07ae-01151001d939

- ingestion of lead fragments/particles that are present in discarded viscera (gut piles) from the field dressing of large game,

- ingestion of lead fragments/particles present in contaminated silage.

The Dossier Submitter estimates that, in the EU, at least 135 million birds are at risk of primary poisoning from lead gunshot, 14 million are at risk of secondary poisoning and seven million birds are at risk because of the ingestion (primary poisoning) of fishing sinkers and lures.

At least 92 species of birds[4] are at risk of lethal and sub-lethal lead poisoning[5] from lead ammunition and lead fishing tackle (sinkers and lures). These species are either known to ingest these objects or their feeding ecology makes them particularly likely to ingest these objects.

From these species at risk more than one million birds are expected to die per year due to primary ingestion. The number of birds expected to die as a result of secondary ingestion cannot be quantified because the information needed to do this is not available. A significant number of birds are also expected to be affected by sub-lethal poisoning, which may also contribute to premature mortality. For long-lived species with low reproductive rates (e.g. raptors and scavengers) mortality of individual birds may be of conservation concern should their populations already be critically endangered.

In addition to primary ingestion risks, spent lead projectiles from sports shooting can contaminate the environment both during the service life and the end of life of a range[6] potentially leading to a variety of on-site and off-site risks.

Lead accumulation at sports shooting ranges may result in leaching of lead polluted surface (runoff) water into local watercourses. Under certain circumstances, groundwater may also be affected. Risks to (or via) groundwater are only likely to materialise many years after use of lead, potentially after the closure of the range.

At EU level no harmonised measure is in place to adequately manage risks to the soil and surface water compartments from uses of lead in ammunition for sports shooting, as well as to other specific receptors such as groundwater, livestock and wildlife (primarily birds).

Lead is not only hazardous for the environment, it is also toxic to humans of all ages and affects various organs. The detrimental health effects of lead are well documented. The range of reported adverse effects includes neurodevelopmental effects in foetuses, babies and small children, cardiovascular diseases, impaired renal function (including chronic kidney disease – CKD), hypertension, impaired fertility and adverse pregnancy outcomes in adults. However, the greatest public health concern is the neurodevelopmental toxicity of lead in children aged seven and younger.

Human exposure to lead from ammunition and fishing tackle occurs via inhalation and ingestion. Additionally, humans may be exposed to lead via the environment through the intake of food and drinking water contaminated from shooting activities and via the

[4] Waterbird species which may also feed in terrestrial environments have been included.

[5] Lethal and sub-lethal effects can occur after acute and/or chronic exposure. Sub-lethal lead poisoning can increase the probability of mortality from hunting (predation), collisions with objects (flying accidents) and illness or death from disease.

[6] This includes agricultural soils and soils which may be used for recreational or residential purposes, depending on the use of land at the end of life of a range.

consumption of game meat hunted with lead gunshot or projectiles. An additional concern is the practise of artisanal casting of fishing weights and bullets in the home or small businesses, leading to direct exposure to lead through inhalation or hand-to-mouth behaviour.

Based on the assessment performed, the Dossier Submitter concludes that the use of lead in gunshot, other projectiles not defined as gunshot (i.e. bullets and airgun pellets), fishing sinkers and lures poses a risk to wildlife, livestock, environment and human health that is **not adequately controlled**, and needs to be addressed at the EU level.

As a result, the Dossier Submitter is proposing a restriction comprising three main types of measures:

1. A ban on placing on the market combined with a ban on use where use will inevitably result in releases to the environment, irrespective of the conditions of use, and where suitable alternatives are available (i.e. technically, economically feasible and resulting in an overall reduction of the risk for human health and the environment). This includes a ban on the placing on the market and use of lead gunshot, fishing sinkers, lures and wire containing lead in a concentration equal to or greater than 1%. For some of these uses, a transition period is proposed to allow sufficient time for stakeholders to comply with the restriction.

2. Where a ban on placing on the market would disproportionately affect uses outside of the scope of the proposed restriction (such as police and military applications), a ban on the use only is proposed. This is the case for projectiles not defined as gunshot.

3. There is an obligation for retailers to inform consumers at the point of sale about the phase-out timelines for uses of lead in ammunition and fishing sinkers as well as information on the presence, toxicity and risk of lead to human health and the environment. Retailers will also be obliged to provide information to customers about the availability of alternatives to lead-containing articles (fishing tackle, gunshot, projectiles). This requirement is built on recent studies that highlight the importance of hunters' and fishers' awareness of hazard and risk for changing purchasing behaviour.

A derogation is proposed for outdoor sports shooting with projectiles other than gunshot conditional on the implementation of appropriate and effective RMMs. In addition, derogations are proposed for specific uses of bullets (seal hunting) and specific types of bullets (full metal jacket bullets).

A derogation for continued use of lead gunshot for sports shooting is presented as an option for the decision-making stage in the event that the decision-maker would not wish to impose an EU-wide ban on the placing on the market or use of lead gunshot for sports shooting. The intention of presenting this option is to clarify the costs and benefits of allowing the continued use of lead gunshot for sports shooting under such conditions that the identified risks could be minimised. The derogation, referred to by the Dossier Submitter as an 'optional conditional derogation', would set a minimum standard of RMMs at sites using lead gunshot and would introduce obligations for Member States to properly identify and license only those athletes that have a legitimate need to use lead gunshot (for example to train for, or participate in, international competitions that require the use of lead gunshot by virtue of their current rules – e.g. Olympic Games, ISSF or FITASC events). Furthermore, this derogation would be accompanied by a labelling requirement for the supplier and a reporting requirement for the Member States which would grant such a derogation. This will allow the Commission to monitor the continued use of lead gunshot in different EU Member States and facilitate the enforcement of the derogation.

It is important to note that the Dossier Submitter's preferred option is a complete ban on the use of lead gunshot in sports shooting. However, the Dossier Submitter recognises that

although the 'optional conditional derogation' for gunshot will not be as effective in controlling the identified risks as a complete ban on use, it may be considered more proportionate by the decision-maker, should the rules of international competitions continue to require the use of lead gunshot.

Based on the assessment of the overall risk reduction potential and the socio-economic impacts for each sector and use affected, the Dossier Submitter concluded that overall, the proposed restriction is effective and proportionate. Table 3 provides a summary of the costs and emission reduction expected from the proposed restriction.

Table 3: Summary of the Dossier Submitter's mean estimates of costs, emission reduction, and costs per kg of avoided releases by sector and/or use (*incl. SEAC's modifications where applicable*)

Sector / Use	**Costs over 20 years[2]**	**Emission reduction over 20 years[2]**	**Costs per kg of avoided releases[2]**
Hunting with gunshot	€768 million (*SEAC: €342 million*) (range: €28-1 310 million)	209 000 tonnes (range: 159 000-259 000 tonnes)	€3.7/kg *(SEAC: €1.6/kg)* (range: €0.2-5.1/kg)
Hunting with bullets – small calibres	€122 million (range: €54-179 million)	232 tonnes (range: 208-255 tonnes)	€525/kg (range: €258-705/kg)
Hunting with bullets – large calibres	€239 million (range: €101-412 million)	2 200 tonnes (range: 1 700-2 500 tonnes)	€109/kg (range: €60-162/kg)
Outdoor sports shooting with gunshot	PREFERRED OPTION: €364 million (range: €177-596 million) [OPTIONAL CONDITIONAL DEROGATION: €506-591 million (range: €207-236 million – €913-1 044 million)][3]	PREFERRED OPTION: 367 500 tonnes (range: 210 000-525 000 tonnes) [OPTIONAL CONDITIONAL DEROGATION: 349 125 tonnes][3]	PREFERRED OPTION: €1.0/kg (range: €0.8-1.1/kg) [OPTIONAL CONDITIONAL DEROGATION: €1.4-1.7/kg (range: €0.6-0.7/kg – €2.6-3.0/kg)][3]
Outdoor sports shooting with bullets – all calibres (preferred option)	€1 094 million (range: €859-1 329 million)	5 800 tonnes (range: 83-20 434 tonnes)	€189/kg (range: 65-10 306 €/kg)
Fishing	€9 300 million (range: €~0-48 000 million)	48 300 tonnes (range: 32 200-112 700)	€193/kg (range: €0.01-996/kg)
Total[1]	**~ €12 000 million**	**~ 633 000 tonnes**	**~ €19/kg**

Notes: 1. For the preferred option. 2. Dossier Submitter's central estimates (ranges in parentheses). 3. Optional derogation under strict conditions for licensed individuals only.

2.2. Summary of SEAC draft opinion

SEAC agrees that, based on the key principles of ensuring a consistent level of protection across the Union and of maintaining the free movement of goods within the Union, Union-wide regulatory measures are justified.

SEAC furthermore agrees that the proposed restriction is the most appropriate Union-wide measure to address the identified risks (as concluded by RAC), taking into account the proportionality of its socio-economic benefits to its socio-economic costs. However, SEAC identified some areas for which it suggests modifications to the conditions of the proposed restriction:

- SEAC considers that the transition period for using lead gunshot for hunting could be shorter, for example 18 months, instead of five years. SEAC finds that there is not enough evidence indicating that increasing the production volumes of alternative ammunition would require five years. Also, hunting with gunshot significantly contributes to the risks arising from lead. To draw a conclusion on the impacts of a shorter transition period, SEAC is seeking further information in the consultation on its draft opinion.

- SEAC has assessed the derogation for lead gunshot in sports shooting which is intended by the Dossier Submitter as an option for the decision-maker ('optional conditional derogation') and identified some issues concerning its practicality. Furthermore, SEAC considers that if a derogation for lead gunshot in sports shooting is preferred by the decision-maker, it should be limited to the shot sizes used in sports shooting, according to the Fédération Internationale de Tir aux Armes Sportives de Chasse/International Shooting Sport Federation (FITASC/ISSF) rules. This means shot sizes between 1.9 and 2.6 mm, while larger shot sizes that are commonly used for hunting should be excluded. The aim is to retain the advantages of a ban on placing on the market of lead gunshot in terms of simple and effective enforcement as much as possible.

- SEAC considers that the same concentration threshold of 1 % weight by weight (w/w) proposed for restricting the placing on the market and use of lead ammunition and fishing tackle should also apply to the labelling and information requirements to avoid confusion and to aid enforcement. SEAC points out that the threshold in the restriction of lead gunshot in or around wetlands is also 1 % w/w.

Furthermore, in some areas, SEAC is lacking information to conclude on the potential impacts of the proposed restriction and possible further modifications to the conditions. Further relevant information on these areas may be received in the consultation on the SEAC draft opinion:

- Regarding the labelling requirement, where a ban on use only is proposed (paragraph 5b), SEAC considers that this will support enforcement of the ban on use of lead bullets in the field. However, labelling on the package alone does not ensure that a single lead bullet is clearly identifiable, for instance, if bullets are carried without the packaging. Therefore, labelling of individual bullets, e.g. by using markings or colour coding, would facilitate inspections in the field. However, SEAC has no robust information on whether this would be technically feasible and if so, what costs it would entail to implement.

- Regarding the ban on the use of lead ammunition in muzzle loaders or other historical weapons outside of shooting ranges, SEAC considers that a conclusion on whether a derogation of this use would be justified is not possible due to lack of information on the socio-economic impacts involved. Hence, unless further information is received in

the consultation on the SEAC draft opinion this decision will have to be taken based on policy priorities.

- Regarding fishing tackle, SEAC considers that further information on the impacts of restricting certain uses, e.g. lead sinkers and lures > 50 g and lead split shots, would be needed before it could be concluded that a derogation from the proposed ban for these uses could be justified on socio-economic grounds.

While SEAC agrees that, overall, the scope of the proposal has been clearly described and justified, the draft opinion highlights the following issues, in addition to the points described above:

- SEAC concludes that it is not clear if all forms of shooting undertaken for 'technical testing and development' are covered by the exemption formulated by the Dossier Submitter (paragraph 8) or by the general exemption of scientific research and development (SR&D) under REACH. SEAC elaborated in the Background Document on some forms of technical testing and development, which will need to be covered by the exemption according to the Dossier Submitter's intention.

- SEAC has too limited information to conclude whether the effort to introduce an information requirement ('retailer duty' as described in paragraph 5a of the proposed restriction entry) is fully justified or if other educational measures suggested by the Dossier Submitter could be more effective, for example as part of national hunting or fishing exams for those Member States that have such exams.

SEAC agrees with the approach taken by the Dossier Submitter to assess the costs and benefits of the proposed restriction. SEAC identified some shortcomings and uncertainties in the Dossier Submitter's assessment but, generally, considers the ranges of the cost and emission estimates provided by the Dossier Submitter appropriate to indicate the order of magnitude of the impacts to be expected from the proposed restriction. With regard to the monetised benefits estimated by the Dossier Submitter, SEAC considers it important to note that these reflect only part of the impacts to be expected from the proposal and that the unquantified benefits are likely to be significant. SEAC also evaluated potential 'other impacts' of the proposed restriction, including on hunting activities, the distribution of economic impacts from upgrading RMMs at shooting ranges across the various Member States, effects on the availability of shooting ranges for military training, and effects on the supply of lead ammunition for non-civilian use. Based on the available information on the impacts of the proposed restriction, the cost-effectiveness analysis, cost-benefit considerations, as well as the affordability to hunters, sports shooters and fishers, SEAC concludes that the proposed restriction can be considered to be proportionate whilst noting the lack of information for specific elements, as listed above.

SEAC concludes that although, in principle, enforcement of the proposed restriction is possible, present enforcement structures are not well suited for this task, particularly if the final implementation of the proposed restriction would necessitate the inspection of private persons or shooting ranges and not only of the sale of ammunition/fishing tackle. SEAC also notes that successful enforcement may call for intensified additional cooperation and agreement between various government control agencies. Moreover, because in different Member States different control agencies may be involved, it might also be difficult to ensure meeting minimum standards throughout the Union. SEAC considers that new cooperating structures might need to be developed which will add to the complexity of organizing enforcement as well as costs. SEAC considers the proposed restriction to be monitorable.

3. JUSTIFICATION FOR THE OPINION OF RAC AND SEAC

3.1. IDENTIFIED HAZARD, EXPOSURE/EMISSIONS AND RISK

Justification for the opinion of RAC

See RAC opinion.

3.2. JUSTIFICATION IF ACTION IS REQUIRED ON A UNION-WIDE BASIS

Justification for the opinion of SEAC and RAC

Summary of proposal:

The Dossier Submitter concludes that lead used in gunshot and other types of projectiles (i.e. bullets and airgun pellets) for outdoor shooting (hunting and sports shooting) and in some uses of fishing tackle (such as sinkers and lures) poses risks to the environment and human health, in particular to birds and vulnerable populations such as children, that is not adequately controlled and needs to be addressed at the EU level.

The four main justifications for action on a Union-wide basis put forward by the Dossier Submitter are:

1. To ensure a harmonised high level of protection of the environment and human health to address the risks identified.

2. To address the lack of EU-wide commitment to fulfil the EU Birds Directive, the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), the Convention on the Conservation of Migratory Species of Wild Animals (CMS)[7], and the CMS Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia (Raptors MOU)[8] to protect birds and their habitats.

3. To ensure the free movement of goods within the Union.

4. To ensure a level playing field for all engaged in sports shooting within the EU.

SEAC and RAC conclusion(s):

The use of lead in hunting, sports shooting and fishing is widespread and presents a risk to the environment and to human health that is not adequately controlled (either from direct exposure or from exposure via the environment). Even if some Member States have already taken specific measures to limit or ban the use of lead ammunition for hunting, sports shooting or fishing, the risks posed by lead will still be observed Union-wide without further action. Therefore, based on the key principles of ensuring a consistent level of protection across the Union and of maintaining the free movement of goods within the Union, SEAC and RAC agree that Union-wide regulatory measures are justified.

Key elements underpinning the SEAC and RAC conclusion(s):

[7] https://www.cms.int/en/legalinstrument/cms (accessed 4 May 2021)

[8] https://www.cms.int/raptors/en/legalinstrument/birds-prey-raptors (accessed 4 May 2021)

The Dossier Submitter presents convincing arguments to justify acting on a Union-wide basis:

- *To ensure a harmonised high level of protection of the environment and human health to address the identified risks:*

  The Dossier Submitter reported that the use of lead in ammunition outdoors and in fishing tackle contributes to lead pollution in the environment. The negative impacts of lead in the environment are well-documented, in particular in terms of adverse effects on birds. Birds may ingest spent gunshot, bullet fragments or fishing tackle leading to lead poisoning, which can result in death or sub-lethal toxicity. Moreover, there are negative impacts possible due to secondary poisoning in the food chain. Many species of birds migrate across EU Member States, meaning the negative impacts of lead poisoning are apparent Union-wide, even in Member States that have already introduced regulations preventing or limiting the use of lead in hunting, sports shooting or fishing (e.g. Denmark, The Netherlands).

  The Background Document demonstrates that human health risks of lead in ammunition – mainly related to exposure via food – and of lead in some uses of fishing tackle (e.g. sinkers and lures) – mainly associated with home-casting and hand-to-mouth exposure – are presently not adequately controlled, including in vulnerable populations (e.g. children).

  The use of lead ammunition and fishing tackle in Europe remains widespread despite its risks to both wildlife and human health. Approximately 44 000 tonnes of lead are dispersed every year in the environment: 57% from sports shooting, 32% from hunting and 11% from fishing. Because these risks are a Union-wide concern, SEAC and RAC agree that initiating Union-wide regulatory action is appropriate.

- *To address the lack of EU-wide commitment to fulfil the EU Birds Directive and other international agreements towards the protection of birds and their habitats:*

  SEAC and RAC note that several species reported to be regularly affected by lead poisoning are specifically protected by the Birds Directive[9]. Even though the Birds Directive explicitly requires hunting practices to not jeopardise conservation efforts[10], its implementation in most Member States does not sufficiently address the risks to birds arising from the use of lead ammunition. Also, other EU and international agreements to protect natural habitats and endangered species have not tackled this regulatory gap (see point 2 of the *Summary of proposal* section above). Therefore, specific regulatory action to address the risks posed by the use of lead in outdoor shooting and fishing is needed to contribute to the goal of the EU Birds Directive to protect wild bird species in the EU.

  Moreover, the proposed restriction can be considered to have a positive impact on the implementation of the Water Framework Directive as lead is listed as a priority substance.

- *To ensure the free movement of goods within the Union:*

  Existing national regulations on lead use in shooting and fishing for the protection of human health and the environment across Member States are very diverse. They range from almost-complete bans, to voluntary restrictions, to no regulation at all. This situation also affects the internal market for lead ammunition and fishing tackle.

[9] Annex I of Directive 2009/147/EC

[10] Article 7 Directive 2009/147/EC

Furthermore, SEAC agrees with the Dossier Submitter that the market for firearms and ammunition used for hunting and sports shooting is served by a limited number of manufacturers operating internationally and thus should be regulated in as harmonised a manner as possible. The same rules throughout the European Union would allow manufacturers and distributors to send a consistent message to their customers about the availability of alternatives and at the same time would allow to simplify offerings of the range of ammunition types in the various Member States, which would allow suppliers to benefit from reduced costs because of economy of scale in production and storage.

- *To ensure a level playing field for all engaged in sports shooting:*

  SEAC agrees with the Dossier Submitter that the proposal will contribute to create harmonised conditions for sport shooters within the EU.

  Taking part in international competitions (e.g. Olympic Games, ISSF or FITASC events) makes it necessary that participants can prepare for such events under optimal conditions, which represent the conditions during the competition as closely as possible. Because for the time being, the rules at international competitions still prescribe the use of lead ammunition, the political decision-maker may consider it as desirable or necessary to create training opportunities for the participation in such events allowing the use of lead ammunition by means of a special derogation as an interim solution.

  Whilst the impacts of the proposed restriction with and without a special derogation were assessed by the Dossier Submitter (and are evaluated by SEAC), it is not within SEAC's remit to comment on political reasons for such a derogation or to recommend any particular policy in relation to rule changes at European or international level. Moreover, the impact of any future potential initiative on a political level resulting from the proposal cannot be evaluated by SEAC.

  However, SEAC notes that despite some initiatives in the past to change the international rules in this respect, the international sports shooting federations responsible for setting the rules have been reluctant to consider this, even for cases where non-lead alternatives appear to be available (e.g. for gunshot). The proposed restriction may give further incentives for a review of competition rules on an international level.

3.3. JUSTIFICATION WHETHER THE SUGGESTED RESTRICTION IS THE MOST APPROPRIATE EU-WIDE MEASURE

Justification for the opinion of SEAC and RAC

Scope including derogations

Justification for the opinion of RAC

Summary of proposal:

See RAC opinion.

RAC conclusion(s):

See RAC opinion.

Key elements underpinning the RAC conclusion(s):

See RAC opinion.

Justification for the opinion of SEAC

Summary of proposal:

The Dossier Submitter conducted an analysis of risk management options (RMOs) to identify the most appropriate measure to address the identified risks. The RMOs assessed include regulatory measures under REACH other than restriction, other existing EU legislation, and other possible Union-wide RMOs.

The Dossier Submitter also assessed alternative restriction options (ROs), alone and in combination, for each sector in the scope of the investigation (covering eight uses in total).

As a result, the Dossier Submitter proposes a restriction comprising different types of measures:

- A **ban on placing on the market and use** where the release of lead is impossible or difficult to control by other risk management measures (RMMs), technically and economically feasible alternatives are available, and no disproportionate socio-economic impacts are to be expected from a **complete ban**. A ban on placing on the market and use is proposed to apply to lead in gunshot, fishing wires, sinkers and lures.

- A **ban on use only** where a ban on placing on the market would disproportionately, affect uses outside of the scope of the proposed restriction and uses where releases can be controlled by other RMMs and where there are no suitable alternatives yet. A ban on use only is proposed to apply to lead projectiles other than gunshot (i.e. bullets and airgun pellets) used in hunting and sports shooting (unless sports shooting with bullets or airgun pellets takes place under strict conditions, see next point on 'conditional derogation'). Additionally, a ban on the use of fishing sinkers where the fishing equipment, rig or technique deliberately releases the sinker during use is proposed.

- A **conditional derogation** of uses if releases can be controlled by other RMMs and where there are no suitable alternatives yet, i.e. the use of lead projectiles other than gunshot (i.e. bullets and airgun pellets) in sports shooting if shooting takes place at an outdoor location notified (to the Member State) for sports shooting with appropriate risk management measures in place.

- A **derogation** if the use does not contribute significantly to identified risks. This applies to certain full metal jacket bullets and lead bullets for seal hunting, for which no suitable alternatives exist yet, and to lead in fishing nets, ropes and lines.

- An **information obligation** for retailers **at the point of sale** ('retailer duty') to inform consumers about the phase-out timelines for uses banned and in order to raise awareness of the risks of lead among users. Retailers will also be obliged to inform consumers about the availability of alternatives to lead-containing gunshot, other types of projectiles, and fishing sinkers and lures.

- A **labelling obligation** for suppliers ('supplier duty') where placing on the market will not be restricted in order to facilitate enforcement of a ban on use in the field. This obligation applies to lead projectiles other than gunshot (i.e. bullets and airgun pellets) in hunting and sports shooting.

For some of the uses banned, a transition period is proposed to allow sufficient time for stakeholders to comply with the restriction, taking into account the availability of alternatives.

The Dossier Submitter proposes different lead concentration limits for placing on the market and using (≥ 1% w/w), and for the labelling ('supplier duty') and information ('retailer duty') obligations (≥ 0.3% w/w). Additionally, the Dossier Submitter proposes by way of derogation a lead concentration limit equal to or greater than 3% w/w for any other projectiles not defined as gunshot made of copper or copper alloys. This derogation shall be subject to a review prior to entry into force to determine if a concentration less than 1% can be achieved.

The restriction report clarifies that the focus of the restriction proposal is on lead projectiles used in firearms and airguns. Therefore, the use of lead in other ammunition components (e.g. primers, propellants and casings) is outside the scope of the restriction proposal. **Indoor uses** of lead projectiles and military uses of lead projectiles, along with other similar **non-civilian uses** of lead projectiles such as by the police, security services and customs forces, are also intended to be **outside the scope** of the restriction proposal.

The Background Document makes it clear that the Dossier Submitter prefers a complete ban on the placing on the market and use of lead gunshot. However, the Dossier Submitter also investigated the impacts of an '**optional conditional derogation**' to allow the continued placing on the market and use of lead gunshot for sports shooting. This option may be considered by the decision-maker to allow the participation of EU athletes in national or international shooting events (or the hosting of such events in EU countries), where the use of lead gunshot is currently still required by the rules of these events and it is deemed important that all participants can train for and practice their sport under equal conditions. The optional conditional derogation identifies a set of minimum RMMs to be implemented at sites using lead gunshot. Implementation of this option by the decision-maker would also introduce specific obligations for the Member States, including the issuing of **permits** for shooting ranges that have implemented specific RMMs for this purpose and **licences** for those users that have a legitimate need to use lead gunshot. In addition, this option would be accompanied by a **labelling requirement** for suppliers ('supplier duty') and a **reporting requirement for the Member States** which would grant such permits and licences.

Finally, the Dossier Submitter lists some Union-wide measures other than a restriction under REACH that could also be implemented by national associations or national authorities to support the proposed restriction.

A summary of the proposed restriction by sector and use can be found in the Background Document (Executive Summary, Table 3).

SEAC conclusion(s):

In all, SEAC agrees that the scope of the proposal in general has been clearly described and justified in the Background Document.

However, SEAC concludes that it is not clear if all forms of shooting undertaken for 'technical testing and development' are covered by the exemption formulated by the Dossier Submitter (paragraph 8) or by the general exemption of scientific research and development (SR&D) under REACH. SEAC will elaborate on some forms of technical testing and development, which will need to be covered by the exemption according to the Dossier Submitter's intention (see SEAC box in the Background Document section 2.7.3).

With regard to the ban on the use of lead ammunition in muzzle loaders or other historical weapons outside of shooting ranges, SEAC considers that a final conclusion on whether a derogation of this use would be justified is not possible due to lack of information on the socio-economic impacts involved. Hence, unless further information is received in the consultation on the SEAC draft opinion this decision will have to be taken based on policy priorities (see also section 3.3.2.4 on proportionality).

SEAC has too limited information to conclude whether the effort to introduce an information

requirement ('retailer duty' as described in paragraph 5a of the proposed restriction entry) is fully justified or if other educational measures suggested by the Dossier Submitter could be more effective, for example as part of national hunting or fishing exams for those Member States that have such exams.

With regard to the labelling requirement, where a ban on use only is proposed (paragraph 5b), SEAC considers that this will support enforcement of the ban on use of lead bullets in the field. However, labelling on the package alone does not ensure that a single lead bullet is clearly identifiable, for instance, if bullets are carried without the packaging. Therefore, it would facilitate inspections if the bullet itself would also be marked. However, SEAC has no robust information on whether this would be technically feasible and if so, what costs it would entail.

In response to comments received in the consultation on the Annex XV report indicating difficulties to implement the concentration limit of 1% for certain types of bullets (copper or copper alloys), the Dossier Submitter proposed a higher limit of 3% linked to a review before entry into force. As an additional concentration limit may complicate enforcement, SEAC agrees that the proposed review of the concentration limit would be very useful to ensure that the need for a higher limit value is substantiated.

Hunting

With regard to lead gunshot, SEAC finds that the need for a transition period of five years has not been sufficiently substantiated by evidence to support that the increase in production capacities of alternatives would require this much time. Here, further information would be required for SEAC to draw a conclusion on the impacts of the transition period proposed, in particular taking account of the potential effect of the ban on use of lead in gunshot in wetlands on production capacities of alternative gunshot. SEAC considers a shorter transition period for the ban on use in hunting, e.g. 18 months, could be justified, because hunting with gunshot significantly contributes to the risk to be addressed by the proposal. In order to draw a conclusion on the impacts of a shorter transition period SEAC will ask for further information in the consultation on SEAC's draft opinion.

With regard to lead bullets, SEAC agrees with the Dossier Submitter that a longer transition period is required for small calibres/rimfire cartridges, because the availability and performance of alternatives are not yet sufficiently developed compared to large calibres. A review of the availability and technical performance of alternatives for hunting as proposed by the Dossier Submitter is supported by SEAC.

Sports shooting

SEAC understands the intention to provide to the decision-maker the option for a derogation for sports shooting under certain conditions. SEAC has assessed the practicality and expected impacts of the optional conditional derogation as defined by the Dossier Submitter, and has some concerns that are further explained below. SEAC considers that in case a derogation of lead gunshot is preferred by the decision-maker, it should be targeted to the minimum and maximum shot sizes that according to the FITASC/ISSF rules[11] are used in sports shooting, i.e. between 1.9 and 2.6 mm, in order to retain the advantages of a ban on placing on the market of lead gunshot as much as possible.

[11] The rules for the different FITASC disciplines (Compak sporting, Universal Trench, Sporting, Helice, Combined Game Shooting, Trap1, Universal Skeet) are available at: https://www.fitasc.com/uk/content/10/1 (accessed 3 May 2022). The rules for different shotgun ISSF disciplines (Trap, Double Trap, Skeet, Trap Mixed Team, Skeet Mixed Team) are available at: https://www.issf-sports.org/theissf/rules_and_regulations/shotgun_rules.ashx (accessed 19 May 2022).

In relation to the conditional derogation for sports shooting with projectiles other than gunshot (i.e. bullets and airgun pellets) and the optional conditional derogation for sports shooting with gunshot, SEAC considers that the transition period of 5 years that is proposed in the updated Background Document is appropriate for allowing the implementation of the proposed RMMs.

Where lead recovery is part of the conditions proposed, it is implicitly assumed that any lead recovered under the conditions of the restriction will be recycled in a safe and technically accepted manner.

Fishing

SEAC agrees in principle with the scope of the Dossier Submitter's proposal for fishing. However, SEAC considers that further information on the impacts of banning certain uses, e.g. lead sinkers and lures > 50 g and lead split shots, would be needed before it could be concluded that a derogation for these uses could be justified on socio-economic grounds (see below). Hence, SEAC will draw a conclusion on whether or not derogations for these uses would be justified in the SEAC final opinion in order to consider additional information that may be submitted during the consultation on the SEAC draft opinion.

Key elements underpinning the SEAC conclusion(s):

A. General issues

Scope of the proposed restriction

Based on the request by the European Commission, the proposal focusses on uses in shooting and fishing where lead is released to the environment during use. Accordingly, it only covers outdoor activities. Potential risks to human health resulting from lead exposure during indoor shooting are not intended to be addressed by the proposed restriction.

The background and rationale for the derogations and the way they are phrased can be understood if one considers the comments that have been received from various stakeholders in the preparation of the restriction.

In addition to military uses, other 'on duty' uses by non-civilians are also intended to be excluded from the scope of the proposed restriction, such as those by the police or equivalent law enforcement authorities. In addition, SEAC notes that the Dossier Submitter clarified if and under what circumstances certain other civilian uses are intended to be inside the scope or are intended to be derogated, e.g. for self-defence (intended to be outside scope), or voluntary military training (intended to be inside scope). However, the Dossier Submitter considers that training/practice for excluded uses should only take place on shooting ranges that have the necessary RMMs described for the conditional derogation for using projectiles other than gunshot.

Technical testing and development of materials are also not intended to be covered by the proposal and is considered by the Dossier Submitter to be exempted based on the specific formulation in paragraph 8 of the entry proposal or based on the general exclusion of scientific research and development (SR&D) from restrictions under REACH. As technical shooting goes beyond what is commonly seen as technical testing and proofing of firearms, SEAC sees a need to clarify the range of applications which are indeed exempted by including a box in the final Background Document that shows another example of technical shooting related to the testing of pressurised gas cylinders, as described in e.g. EN 12245.

SEAC also notes that the use of lead-based ammunition would be banned for **vintage and/or muzzle loading weapons**, unless used at a shooting range that fulfils the conditions set in the restriction. This means that hunting with such weapons would no longer be possible,

because according to the Dossier Submitter's analysis no lead-free ammunition is available for the use in antique muzzle loading guns. In the consultation there have been requests for a derogation of lead ammunition in muzzle loaders (e.g. #3254). SEAC assessed the impacts of a potential derogation based on the limited information available on the current use of muzzle loaders (please refer to section 3.3.2.4 on proportionality).

It has to be stressed that the proposed restriction does not cover the *manufacture* of ammunition and fishing tackle at *industrial* sites. 'Industrial' uses are therefore not assessed in the Annex XV report.

The Dossier Submitter identified that the casting of lead bullets and lead fishing tackle activity in 'non-industrial' settings presents a risk, especially for human health. These activities, either performed by the general public in a private setting (so-called 'home-casting'), or at larger scale in 'garage' type settings or in the back rooms of fishing shops, are carried out without the supervision of the usual national OSH, and industrial emission regulations. Therefore, the assessment of the risks associated with 'home-casted' lead fishing tackle (and lead ammunition) is within the scope of the Annex XV report and proposed restriction. Because *use* of lead projectiles and fishing tackle that are produced in private settings would also be restricted, the Dossier Submitter expects that the ban on use will effectively discourage this activity. If home-casting as an activity was an explicit part of the scope of the restriction, enforcement would be difficult, because it takes place in the private sphere.

SEAC understands that the Dossier Submitter sees the introduction of warnings to be displayed at the point of sale by the retailer ('retailer duty' as described in paragraph 5a of the proposed restriction entry), which go beyond labelling requirements already needed because of other regulations, as an element that will support a change in the behaviour of the users during the transitional (phase out) periods. The available literature on the use of similar warnings on tobacco and alcohol products in Europe and the USA shows mixed effects (Woelbert and d'Hombres, 2018; Hammond, 2011; Williams et al., 2012; Hoek et al., 2011). What seems to be a consistent outcome of various investigations, is the fact that pictures seem to generate a stronger effect with consumers than text-only warnings. It is unclear to what extent these findings are transferrable to lead in outdoor shooting and fishing. In this respect it must be considered that the consumers in this case are hunters, sports shooters or fishers who are likely to already be well aware of the hazards of lead in general, because of the discussions that have been ongoing already for quite some time, though not necessarily about the risks in the specific outdoor shooting or fishing situation. SEAC considers that the available information is insufficient to reach a conclusion as to whether text-only warnings, as proposed, will significantly influence the purchasing behaviour of consumers during the transitional periods. Therefore, it is difficult to conclude if the effort and costs to introduce such an information requirement is justified or if the other approaches to influence purchasing behaviour, outside of REACH, suggested by the Dossier Submitter, such as education, for example as part of national hunting or fishing exams, could be more effective as an alternative or complementary measure for those Member States that have such exams.

As a concentration limit value for lead, the Dossier Submitter proposed 1 % along the lines of the restriction of lead gunshot in wetlands. SEAC considers this useful. In the consultation on the Annex XV report it was raised that a 1 % limit would not be achievable for copper or copper alloys without inadvertently affecting existing alternatives to lead ammunition (#3259, #3503). In response to these comments, the Dossier Submitter proposed a limit of 3 % for projectiles made of copper of copper alloys, which should be reviewed before the restriction enters into force. SEAC considers that a harmonised (single) limit value would be the most simple and hence would facilitate enforcement of the restriction. Therefore, any deviation should be well substantiated and SEAC supports the review proposed by the Dossier Submitter before entry into force to ensure that a deviation is strictly necessary.

Regarding the consideration of an optional conditional derogation for sports shooting with gunshot, SEAC understands that the Dossier Submitter included this as an option for the

decision-maker, because even if as a result of this restriction a certain willingness of sports shooting federations to change competition rules would emerge, it is unlikely that these rules will be changed in a short period of time. Still, SEAC highlights that the implementation of the present restriction proposal (in particular without, but even with, the optional derogation) could act as a driver for international sporting organisations like the International Olympic Committee to meet the environmental protection and sustainability objectives they have already committed to (IOC, 2020).

However, in the SEAC discussions it appeared that often the optional conditional derogation was considered as a part of the preferred option of the proposed restriction. But it should be strongly emphasised that the Dossier Submitter clearly indicated that a total ban on the placing on the market and use of lead gunshot is the preferred restriction option. The impacts of the optional conditional derogation have been analysed to give relevant information to the decision-maker in case such a derogation will be considered. Moreover, the implementation of the optional conditional derogation in the various Member States has caused some concerns, because many SEAC members consider this to be more complicated than assumed by the Dossier Submitter. This is further discussed below.

Analysis of Risk Management Options

The Background Document does not contain a systematic comparison of various RMOs other than restriction. SEAC understands that the limited scope of the analysis of RMOs results from the fact that the Commission requested ECHA to prepare a restriction proposal, thereby pre-empting potential other conclusions. However, SEAC notes that the Dossier Submitter in their assessment still considered options other than restriction, including non-REACH and voluntary measures. A general overview of these options is given in the Background Document in Annex D.1.5 and in Annex D.4.6. The interpretation of these tables is hindered by the fact that in the descriptions impacts on fishing tackle and lead ammunition are somehow mixed up, leading to a lack of clarity to which use of lead it relates. Also, it is not clear to what extent the analysis includes the use of lead in sports shooting. SEAC recommended that the Dossier Submitter revises these tables and generalises them to the hunting and sports shooting sectors of the restriction. However, this has not been taken up in the Background Document.

Noting the limited RMO analysis and the qualification resulting from this limitation, SEAC overall agrees with the Dossier Submitter's conclusion that, on their own, none of these measures will be effective or practical in addressing all of the risks posed by lead in ammunition and fishing tackle in the described uses. Therefore, a restriction is the most appropriate regulatory action to address the identified risks. However, some of the other options that are mentioned could be used to support the effectiveness of the restriction.

Ranking of Restriction Options

The Dossier Submitter ranked the different restriction options identified by scoring their performance with regard to risk reduction and proportionality. No differentiation was made with regard to practicality (including enforceability) or monitorability arguing that all options assessed would fulfil these criteria. SEAC considers that it is still likely that the options assessed vary in terms of their practicality (including enforceability) or monitorability.

In order to assess risk reduction and proportionality, the Dossier Submitter selected key dimensions[12], in which the performance of the different options was scored from best (highest score) to worst (lowest score). SEAC notes that for the different uses (hunting, sports shooting, fishing) covered by the proposal the key dimensions selected were not applied

[12] Key dimensions: lead emission reduction, other environmental risk reduction (for fishing only), human health risk reduction (for fishing only), overall risk reduction (for outdoor shooting), costs, end user acceptance (for fishing only)

consistently, as some dimensions were exclusively used for one use and not for the others without providing justification for this divergence. Also, the ranking approach was not applied if only one restriction option was found to be effective in terms of risk reduction.

SEAC considers that the ranking approach in principle could be a useful tool to distinguish between the various options. However, overall SEAC considers the ranking as performed by the Dossier Submitter not very useful because (i) it is not applied consistently to all uses and options analysed and (ii) it does not evaluate differences in practicality (incl. enforceability) and monitorability.

B. Hunting (use #1, 2a, 2b)

B1. Hunting with gunshot (use #1)

Scope

The Dossier Submitter proposes a ban on placing on the market and use, i.e. a complete ban of lead gunshot for hunting. As such, the scope of the proposal is clear. SEAC agrees with the Dossier Submitter that the proposed restriction would significantly reduce the environmental and human health risks of the use of lead gunshot in hunting.

As a supporting measure, the Dossier Submitter proposes that information on the hazards of lead and the phase-out timetable has to be provided at the point of sale when purchasing lead containing gunshot until the relevant ban on placing on the market and use enters into effect. Please see 'A. General issues' above for SEAC's view on the 'retailer duty'.

In alignment with lead gunshot in sports shooting, the Dossier Submitter proposes a transition period of five years for the ban on placing on the market and use mainly based on time needed for industry to adapt manufacturing processes and to increase production of non-lead gunshot cartridges. Including the time needed for the decision-making process this means that the restriction most likely would not enter into force before 2029. SEAC considers that the justification for the length of the transition period is insufficient and that the transitional period could potentially be shorter, in particular for the use of lead gunshot in hunting. This is based on the fact that most manufacturers of ammunition already offer alternative gunshot cartridges and that supply is already likely to increase to meet the demand envisaged by the restriction of the use of lead gunshot in wetlands, which enters into effect in early 2023.

If it is not possible to increase production to cover the total demand for lead gunshot (~38 500 tonnes per year for sports shooting and hunting together) sooner than five years, SEAC considers that it could also be an option to have a shorter transitional period for the ban on use of lead gunshot in hunting (~14 000 tonnes per year) compared to sports shooting (~24 500 tonnes per year), because hunting with gunshot significantly contributes to the identified risk. There is ample evidence available showing that technically and economically feasible alternatives are available on the market and used by hunters where already a partial or total ban of lead gunshot was implemented. All major manufacturers have already introduced non-lead shot to their portfolio, indicating that the time needed for further R&D or product development is likely to be limited. In line with this observation, the Dossier Submitter's main justification for a 5-year transition period is information received from industry stating that for a complete phaseout of lead gunshot, substantial time would be needed to increase production of steel gunshot in order to meet the demand for hunting and sports shooting. Assuming a steady increase of production of steel gunshot over a period of five years, SEAC considers it may be feasible to meet market demand of hunters earlier, e.g. after 18 months from entry into force, in particular if the restriction of the use of lead gunshot in wetlands will lead to an increase in current production capacities.

However, as the Dossier Submitter did not assess the impacts of a phased ban with different transitional periods for the use of lead gunshot in hunting and sports shooting in detail and

as there is no explicit information on the investment needed to meet the total demand for gunshot with alternatives, SEAC cannot conclude on the impacts of alternative transitional periods for a ban of lead gunshot in hunting. Therefore, SEAC will seek to obtain more information on the development of production capacities in order to support the decision-maker to conclude on the appropriateness of the length of the transition period (please see further discussion of the impacts of the ban of lead gunshot in section on proportionality 3.3.2.4).

Analysis of Restriction Options

The Dossier Submitter identified and analysed five different restriction options (ROs) for the use of lead gunshot in hunting (see Table 2-1 in the Background Document):

- RO1: Ban on the placing on the market and use of lead gunshot for hunting
- RO2: Require specific design/construction of lead gunshot
- RO3: Ban on the placing on the market of game meat hunted with lead gunshot or maximum levels of lead in game meat
- RO4: Advice to cut away more meat when handling game and meat hunted with lead gunshot
- RO5: Compulsory information on the hazards of lead and the risks of using lead ammunition, transition periods and availability of alternatives at the point of sale and incorporated in national hunting exams

SEAC agrees that out of the different measures analysed, RO1 (ban on placing on the market and use of lead gunshot for hunting), is the only option that is sufficiently effective to reduce the risks of lead in gunshot used for hunting. SEAC notes that implementing a ban on placing on the market constitutes a complete ban of lead gunshot, i.e. including for sports shooting, which is also the preferred option proposed by the Dossier Submitter (in combination with compulsory information on the hazards of lead and the risks of using lead ammunition to be provided to users).

SEAC considers that the optional conditional derogation of lead gunshot in sports shooting could undermine the effectiveness of the proposed restriction for lead gunshot in hunting, because it could compromise the advantages of a ban on placing on the market in terms of enforceability as lead gunshot would remain available on the market to a very limited number of actors (see discussion under C1 below). It could also mean that lead gunshot might be more accessible for illegal use in hunting. It is uncertain to what extent this would happen and if it could have a major impact on the effectiveness of the restriction. Nevertheless, this situation would be closer to a 'ban on use only', in which enforcement in the field is decisive for effectiveness. Proper in-field enforcement is likely to require far more resources than enforcement of placing on the market. These potential 'side effects' on the ban of lead gunshot in hunting have to be taken into account when assessing the impacts of the 'optional conditional derogation' in more detail. In this respect, SEAC notes that 'ban on use only' was not a RO that was assessed as part of the Dossier Submitter's analysis. Including this option would have strengthened the RO analysis in the Background Document.

For RO3 (regulation of lead in game meat), effectiveness depends on the share of game meat that is placed on the market rather than consumed (e.g. by hunters and their families) without entering the market. Based on available data on the marketing of game meat, SEAC agrees with the Dossier Submitter that this option is not sufficiently effective, because a considerable share of game meat is consumed privately by hunter families, where any regulation of maximum lead concentrations in game meat would not be practically enforceable. Also, the negative impacts on birds and wildlife will not be addressed by this option.

Similarly, RO2 (require specific design/construction of lead gunshot) and RO4 (advice to cut away more meat when handling game and meat hunted with lead gunshot) will not effectively reduce the risks of using lead gunshot in hunting.

For RO5 (compulsory information on the hazards of lead and the risks of using lead ammunition, transition periods and availability of alternatives at the point of sale and incorporated in national hunting exams), SEAC considers that even though this measure will not be sufficient as a single measure, education can be an effective tool to convince hunters to switch to lead-free alternatives, in particular if supported by influential groups (hunting peers, associations or clubs). Therefore, it can complement a ban and might be more effective than the proposed information requirement at the point of sale alone to raise awareness. In this respect, SEAC notes that the Dossier Submitter suggests educational measures as part of national hunting exams, but this is not reflected in the entry proposal. The main argument for not considering educational measures as part of the proposal is that not all Member States have hunting exams established. SEAC points out that other existing institutional structures such as hunting authorities or associations may also provide a basis to implement educational measures, even though not as part of a national exam.

B2. Hunting with bullets, incl. airgun pellets (use #2a and 2b)

Scope

The proposed restriction envisages a ban on the use of lead projectiles not defined as gunshot (i.e. bullets and airgun pellets) for hunting. The main reason that a ban on use only is proposed is that it ensures that the placing on the market of lead bullets for other uses, i.e. sports shooting as well as uses that are out of scope (e.g. military uses), will still be possible. The Dossier Submitter complemented the ban on use with the requirement to provide information at the point of sale ('retailer duty') as well as with a labelling obligation ('supplier duty'). Please see 'A. General issues' above for SEAC's view on the 'retailer duty'.

Provided that the ban on use is properly enforced, SEAC considers that the proposed restriction effectively reduces the risks of the use of lead bullets in hunting as hunters will switch to alternative materials, which are considered to entail less risk. However, SEAC considers that a ban on use only is likely to be less effective than a complete ban, because enforcement will be more complicated.

Taking into account SEAC's and RAC's assessment of the lead gunshot in wetlands restriction, SEAC considers that the labelling obligation will support enforcement in the field, which contributes to the effectiveness of the proposed restriction. However, labelling on the package does not ensure that a lead bullet is clearly identifiable in the field, for instance if bullets are carried without the packaging. Therefore, also the bullet itself should be marked to facilitate inspections. However, SEAC has no robust information to assess the technical and economic feasibility of such a measure. Here, input from the consultation on the SEAC draft opinion could facilitate to conclude on its appropriateness.

For centrefire ammunition, the Dossier Submitter proposes different transition periods: 5 years for small (< 5.6 mm) and 18 months for large (≥ 5.6 mm) calibres. For rimfire ammunition, 5 years are proposed for all calibres. It is important to note that basically all small calibres used in hunting and sports shooting are rimfire cartridges, e.g. the commonly used .22 LR. SEAC agrees with the Dossier Submitter that a longer transition period is required for small calibres/rimfire cartridges, because the availability and performance of alternatives are not yet sufficiently developed compared to large calibres (see section on costs).

Comments submitted in the consultation on the Annex XV report supported this view on the limited availability of non-lead rimfire bullets as well as their lower performance in terms of precision (#3252). Based on these arguments as well as on a contention that the use of small

calibre bullets results in no or much lower risk to the environment and human health, a derogation was requested by several commenters. In response, the Dossier Submitter proposed a review of the ban before the end of the transition period of 5 years, because environmental and human health impacts from the use of small calibre bullets in hunting cannot be ruled out (confirmed by RAC). SEAC agrees with this proposal.

In the consultation on the Annex XV report, further requests for a derogation were received with regard to ammunition, which is used in very specific hunting situations for which no alternatives are available yet, e.g. hunting with muzzle loaders (see discussion under A above), seal hunting and full metal jacket bullets. For bullets used for seal hunting as well as full metal jacket bullets, the Dossier Submitter proposed a derogation based on the very low volumes of this ammunition used as well as the limited contribution to the risks to be addressed (for SEAC's evaluation, please refer to section 3.3.2.4 on proportionality).

Analysis of Restriction Options

The Dossier Submitter identified and analysed similar ROs as for lead in gunshot (see Table 2-2 in the Background Document), hence SEAC's views on these also apply here:

- RO1a: Ban on the use of small calibre (< 5.6 mm centrefire and rimfire in general) lead bullets for hunting
- RO1b: Ban on the use of large calibre (≥ 5.6 mm centrefire) lead bullets for hunting
- RO2: Require specific bullet design/construction when lead is used (to minimise lead fragmentation)
- RO3: Ban on placing on the market of game meat hunted with lead bullets or maximum levels of lead in game meat
- RO4: Advice to cut away more meat when handling game and meat hunted with lead bullets
- RO5: Compulsory information on the hazards of lead and the risks of using lead ammunition, transition periods and availability of alternatives at the point of sale and on product packaging and incorporated in national hunting exams

The proposed restriction is a combination of RO1a, RO1b and RO5 (with incorporation of information in national hunting exams considered as a complementary measure).

C. Sports shooting (use #3, 4, 5, 6)

C1. Sports shooting with gunshot (use #3)

Scope

SEAC understands from the analysis of various restriction options for lead gunshot in sports shooting in Section 2.2.2.1 of the Background Document that the Dossier Submitter considers that RO1 (a ban on the placing on the market and the use of lead gunshot for sports shooting) together with the requirement to provide information at the point of sale ('retailer duty') is the most effective restriction option. In view of the current situation where alternatives for lead gunshot appear to be available already, SEAC agrees with the Dossier Submitter's conclusion that a ban on the placing on the market and use is the preferred risk management option.

SEAC further understands that the Dossier Submitter sees the combination of the optional conditional derogation (involving a combined permit/licence system for shooting ranges and

individual athletes and requirements concerning a minimum standard of RMMs) together with a labelling requirement ('supplier duty') and the requirement to provide information at the point of sale ('retailer duty'), as well as a reporting requirement for Member States as a fall-back position, in case the decision-maker would like to avoid impacts on international competitive sports shooting. This option would still allow sports shooters competing at a high level to continue participating in international events and to train for such events as long as international shooting associations only allow the use of lead gunshot, while still reducing the identified risks. Moreover, it would allow continued organisation of such events in Member States. This option would mean that lead gunshot will remain on the market for a limited number of actors. If the permit/licence system and the conditions are reasonably implemented, this should not have a major impact on the effectiveness of the proposed restriction as the bulk of lead gunshot used today would still be covered by the proposed ban. However, in order to retain the advantages of a ban on placing on the market in terms of simple and effective enforcement, SEAC considers that, should the optional conditional derogation be implemented, it should be limited to the minimum and maximum shot sizes used in sports shooting according to FITASC/ISSF rules[11], i.e. 1.9 to 2.6 mm, and exclude the larger shot sizes that are commonly used for hunting.

In assessing the optional conditional derogation, the Dossier Submitter considered different scenarios on how shooting ranges might respond. These scenarios vary in the number of shooting ranges that would upgrade their RMMs in order to be able to fulfil the condition of > 90% lead recovery, and thereby be allowed to continue the use of lead gunshot. In addition, the Dossier Submitter assessed options to allow access to these sites for all shooters (RO3) or only for those having a licence issued by the responsible Member State (RO4). However, in each scenario/option this optional conditional derogation would imply high costs for certain actors (see section on costs below).

SEAC would like to point to some issues that have been raised in the course of the opinion development process and which may cast some doubts on the possibilities to implement such an optional derogation as proposed. Most certainly it would mean that the actors involved (sports shooters, shooting clubs and shooting associations) would need flexibility to adjust to the new conditions and would need to structure their sport differently from today. It also involves a permit/licence system and the involvement of many actors at national level (enforcement, shooting clubs, shooting associations, etc) that need to work out how to organize and finance this on a national level, which will not facilitate a speedy implementation, even if this would be considered desirable by the decision-maker. Moreover, it has to be realised that all this would serve to satisfy the needs of a very limited group of sports shooters only – i.e. those participating in international competitions (estimated at a number of 12 000 in the EU, or about 0.5% of the estimated total of 2 500 000 sports shooters in the EU). It also remains unclear if a transition to "lead shooting status" would present special problems regarding shooting skills once a sports shooter is promoted to the level of international competition.

Furthermore, the Background Document assumes that the proposed permit/licence system for locations and individuals will build on existing systems already in place. It is currently unclear if this is a realistic expectation or if these activities would incur extra costs by authorities. The Background Document describes some basic conditions that the Dossier Submitter envisages as part of a licensing structure for athletes. However, at the same time, it is suggested that the responsibility for organisation and implementation of certain elements of the licensing schemes can be delegated to "national authorities", that are already supervising shooting activities. The decision-maker considering implementing the optional conditional derogation should be aware that this approach, without further specifications that are mandatory and valid for all Member States, may create an outcome that is highly unharmonized across Member States. This would unintentionally run contrary to the objective of a level playing field cited in Section 3.2 above.

In the SEAC discussions it was suggested several times that an (optional) derogation which

will allow the use of gunshot for sports shooting should be limited in time. However, in view of the relatively large investments needed to upgrade RMMs at existing ranges, it appears to be rather unattractive to invest in such an upgrade that would be obsolete in a few years. However, SEAC could imagine that such a time-limited derogation would make sense for RO2 (where permitted shooters may continue the use of lead gunshot, but all others have to change to alternatives). Such a time limit may serve as an incentive for sports shooting associations to look for options to allow the use of alternatives to lead gunshot in international competitions. If it is considered that such processes to change rules usually are inherently slow – a transition time of 10 or 15 years (which would be, respectively, 5 and 10 years longer than the transition period proposed by the Dossier Submitter for the preferred option, i.e. a ban on placing on the market and use) may be considered.

SEAC also noted in the comments from the Annex XV report consultation that the sports shooting part of the dossier has been criticised because the impacts on some sports shooting disciplines other than skeet and trap shooting, which also use gunshot, have not been discussed. It is claimed that these other disciplines may have specific problems with a change to steel shot. In SEAC's view, the consultation comments have not shown that other gunshot disciplines have specific problems using steel shot. The mentioned problems of ricochet and problems for the forest industry (because of steel pellets that become embedded in trees and potentially may cause damage to sawing machines) do not seem to be supported by data from practice.

Analysis of Restriction Options

The Dossier Submitter compared a number of Restriction Options (ROs) for sports shooting with gunshot and rated these using a scoring system for expected effectiveness complemented with considerations on practicality and monitorability/enforceability (see Table 2-4 in the Background Document).

SEAC notes in the scoring system applied by the Dossier Submitter that the reduction of lead release and overall risks, as well as costs for implementation are rated with the same weight. Unfortunately, the rationale behind this choice is not explained by the Dossier Submitter.

The Dossier Submitter considers that **RO1** (ban on placing on the market and use of lead gunshot for sports shooting) is scientifically/technically the preferred restriction option because suitable alternative shot material is available. This restriction option also ranked highest in the Dossier Submitter's analysis. However, this restriction option currently causes problems for the sports shooting sector because rules for international competitions (e.g. Olympic Games, ISSF or FITASC events) currently require the use of lead shot for skeet and trap disciplines.

The Dossier Submitter does not assume that there will be rule changes in the short term that would allow the use of alternative shot materials. The Dossier Submitter also acknowledges that continued participation in international sports shooting competitions is likely to be valued highly by society. Therefore, the Dossier Submitter assumes that decision-makers may consider a complete ban, without any possibility for continued participation in international sports shooting events, to have an unacceptable socio-economic impact for athletes and the interested public. In the input from stakeholders to the Annex XV report consultation, SEAC found little arguments supporting this assumption other than the desire of European athletes (or their associations) to participate at international events as such and to be able to organize such events in the EU. In the view of SEAC it is questionable if quantifiable socio-economic arguments can be brought forward to support this assumption. Data that are available for recent Olympic games do not suggest that organizing such an event is attractive for the organizing city, if only the direct profit/loss balance is considered. However, indirect or follow-up effects may give a more positive picture (McBride, 2018; Malfas et al., 2004).

RO4 (use of lead gunshot is only allowed for licensed individuals at permitted sites with

effective RMMs in place, i.e. regular lead gunshot recovery with > 90% effectiveness, containment, monitoring and treatment of drainage water, ban of any agricultural use within site boundary, and reporting to Commission) ranks second in the Dossier Submitter's analysis. This restriction option would minimise the risks from lead as far as possible but still allowing athletes the participation in international competitions.

RO2 and RO3 rank next. Within **RO2** retailers are allowed to sell lead shot to licensed individuals and these would be allowed to use lead shot on all ranges. No further risk management measures are required to reduce lead release. Limiting the use of lead shot in the EU to licensed athletes would reduce lead release by roughly 50%. Consequently, relevant risks would still remain. Within **RO3** the use of lead shot is allowed for all recreational sports shooters and athletes at permitted sites with effective RMMs in place (which are the same as defined for RO4).

RO5 (compulsory information) ranks lowest but is considered useful to disseminate information for the user about the hazard and risks of lead at the point of sale and, in case the optional conditional derogation is implemented, to support enforcement by an indelible labelling of the product packaging and individual cartridges ('Contains lead: do not use for hunting'). The Dossier Submitter considers that the restriction options RO1, RO2, RO3 and RO4 would be most effective and monitorable when **combined with RO5**.

Taking into account the availability of suitable alternatives, the Dossier Submitter is of the opinion that the socio-economic benefit of the use of lead gunshot in international competitions (e.g. Olympic Games, ISSF or FITASC events) may **not** outweigh the costs of implementing the risk management measures required to control the risks. SEAC agrees with this conclusion of the Dossier Submitter.

Although, each restriction option was assessed individually, the Dossier Submitter considers that the restriction options assessed within the Background Document are not mutually exclusive and could be proposed in conjunction with one another. After consideration of the various options, the Dossier Submitter concludes that a ban on placing on the market and use of lead gunshot for sports shooting (RO1) would be the most effective way to reduce risks and that this should be combined with compulsory information at the point of sale (part of RO5).

However, if a complete ban (RO1) is not considered appropriate by the decision-maker, the Dossier Submitter considers that the optional conditional derogation as defined by RO4 would be practical to minimise the risks whilst allowing continued use for sports shooting and that this should be combined with compulsory information at the point of sale and the labelling of product packaging and individual cartridges (RO5).

SEAC agrees with the ranking and underlying comparison of ROs 1-5. It shows that a total ban would bring the highest reduction in emissions of lead and for that reason is to be preferred. It is clear that options that would soften this ban in order to avoid a loss of opportunities to participate in international competitions, can be made available, albeit at significant costs if additional RMMs are to be implemented and an inevitable reduction in the effectiveness of the restriction regarding reduction of lead release.

However, SEAC has strong reservations regarding the implementation of such an option in the form of the optional conditional derogation assessed by the Dossier Submitter. Not only does this cause high costs for adapting RMMs of shooting ranges to benefit a small group of people, but as mentioned before, SEAC also has some reservations about the perceived ease to implement and maintain the permit/licence systems related to such an optional conditional derogation, as well as the ease to implement reporting duties that have to be taken up by each Member State. More arguments putting SEAC's reservations in a broader perspective can be found in Section 3.3.3 on enforceability below.

In addition, as already explained above, SEAC is uncertain about the supposed effectiveness of the information requirements as far as this is meant to contribute significantly to a change in behaviour of gunshot buyers.

For the decision-maker it is important to realize that implementation of the preferred option RO1 will undoubtedly disrupt the sports shooting sector, because it would no longer allow Member States to host international competitions that require the use of lead gunshot and EU athletes to participate or train for them, effectively excluding them from such events, until a ban on lead would be globally accepted and rules modified accordingly. Unfortunately, there are no indications that the relevant international associations (which also contributed to the Annex XV report consultation) are considering a move in this direction.

However, choosing RO4 would mean that the sports shooting sector would need to re-structure itself in a significant way. The option would create a 'two-level membership' and foresees only a selected number of sites to be permitted for lead use, which may lead to a situation where some licensed athletes will have to travel long distances in order to practice at a site that allows the use of lead. Others may be in a more favourable position and have such a site nearby. Moreover, it remains unclear how easy it is for athletes to change back and forth between shooting with lead (while practicing for international events) and shooting with steel (in their home competitions). This was not addressed in any of the comments in the Annex XV report consultation.

An option that was not considered by the Dossier Submitter, but which may be a pragmatic approach to circumvent some of the complications that may be connected to the optional conditional derogation, would be to limit the licence of RO2 in time (e.g. 5 or 10 years after entry into force of the restriction). This would incentivise the shooting associations to get steel shot approved for international competitions, but still give sufficient time to work on this on a global scale. As a result, it would lead to an avoided lead release that although lower than for RO1 is still higher than for RO2 (as proposed by the Dossier Submitter). A comparison of indicative results as calculated by SEAC appears in Table 4 below. A time-limited derogation/licence for athletes (indicated by RO2a and RO2b in the table) would lead to considerably higher avoided lead release compared to RO2 at only marginally higher costs and comparable cost-effectiveness ratios.

Table 4: Comparison of possible variations to RO2, as calculated by SEAC

Option	Variation	Lead release avoided over 20 years	Costs over 20 years (NPV, 4%)	Cost-effectiveness (€/kg)
RO1	As proposed	367 500 t	€364m	1.0
RO2	As proposed	183 750 t	€336m	1.8
RO2a	5-year exemption for athletes after the transition period	306 250 t	€353m	1.1
RO2b	10-year exemption for athletes after the transition period	245 000 t	€343m	1.4

Note that the figures for RO2a and RO2b were calculated from the data on nominal costs per year after the transition period, as supplied by the Dossier Submitter as mid-ranges for RO1 and RO2. In the calculation it is assumed that for each year that the exemption for athletes is in place (i.e. for 5 or 10 years after the end of the transition period), costs would be counted as for RO2 and for each year in the 20-year assessment period that the exemption has expired

(respectively 10 and 5 years) costs would be counted as for RO1. The total NPV is then calculated as the sum of the discounted contributions for each year.

Transition periods

The restriction text in the Background Document proposes a 5-year transition period for both the preferred option (RO1) and the optional conditional derogation (RO4). Either option is proposed to be combined with compulsory information at the point of sale (retailer duty) for which a transition period of 6 months is foreseen. According to the Dossier Submitter this is intended to increase consumer awareness and prepare them to change their purchasing behaviour until RO1 or RO4 enter into effect. RO4 is additionally proposed to be combined with the labelling of product packaging and individual cartridges (supplier duty), which would still be needed in this option to aid enforcement of the restriction for hunting, because lead shot will still be available for licensed individuals for sports shooting. A 5-year transition period is proposed for the labelling requirement, in line with the transition period proposed for RO4.

SEAC considers the 6-month transition period for the compulsory information at the point of sale will not present major problems, because this is only an action to visually inform customers.

An issue for RO1 may be that, if sports shooters change to alternative gunshot types (mainly steel) all together, this may lead to transient production and supply chain bottle necks, where at first alternative gunshot may not be as commonly available as the traditional lead shot currently is, or may become, more expensive. However, SEAC has no information that would suggest that such supply chain issues (if any) would persist beyond an initial short period of time.

For RO4, the problems of availability of alternative shot for 50% of the market may be the same as for RO1, but because amounts are less, any problems are expected to be overcome even sooner.

For RO4 it is more important if for each Member State the 5-year transition period is enough to work out which shooting sites should be upgraded (or will have the means to do so), and to complete the work related to implementing the necessary RMMs. Provided planning for such actions is initiated early enough (i.e. at the latest after the entry into force of the restriction), the time period indicated seems long enough to implement the changes. SEAC has no information that would suggest otherwise.

C2. Sports shooting with bullets, incl. airgun pellets (use #4, 5, 6)

Scope

For lead projectiles other than gunshot (i.e. bullets and airgun pellets) the situation is somewhat different. On the one hand, a ban on placing on the market is not possible in view of concerns about unintended impacts on other uses not in scope of the proposed restriction (e.g. indoor uses, uses by military or law enforcement) and, on the other hand, a full ban on use is not (yet) possible because of the lack of availability of suitable alternatives for sports shooting with the highest possible accuracy, which is less critical for hunting. This seems especially the case for small calibre bullets and for airgun pellets. Therefore, the proposed ban on use is combined with a conditional derogation on the use taking place at locations that are notified to the respective Member State and which have effective lead projectile containment and recovery measures in place, as well as having a ban on any agricultural activities at those locations (e.g. grazing by cattle).

SEAC notes that in the consultation many comments from the Nordic countries point to the importance of the availability of local shooting ranges to allow practicing by reserve soldiers near home. SEAC notes that the Dossier Submitter considers such training as "civilian use"

and therefore in scope of the proposed restriction, meaning that the use of lead ammunition is limited to "notified sites" complying with the measures described above. RAC has expressed its agreement with this view. However, this view gives rise to some uncertainties regarding the availability of sufficient sites for training. This uncertainty is further addressed in Section 3.4.2 of this opinion. It should be noted that Member States, in order to protect their defence interests, may use the option under REACH Article 2.3 to create an exemption for this type of use.

SEAC notes that the current restriction proposal may lead to a situation where the use of lead bullets in sports shooting will continue indefinitely. A time limit for the derogation would prevent this. However, an obligation to install additional or upgraded RMMs to meet the conditions for the derogation at designated sites is difficult to reconcile with a reasonable amortisation time of the significant investments needed to install such RMMs. Therefore, if a time limit for the derogation would be considered by the decision-maker it would need to be sufficiently long (15 or 20 years) to make such investments a realistic option. On the other hand, a time limit (whatever its length) would stimulate further innovation by the ammunition manufacturers.

Analysis of Restriction Options

SEAC notes that that the various discussions in the course of the opinion development and in the information received in the Annex XV report consultation have led the Dossier Submitter to analyse restriction options in a different way compared to the approach taken in the initially submitted Annex XV dossier.

A similar comparison of restriction options as for gunshot above was made for sports shooting with bullets, including the same scoring system (see Table 2-7 in the Background Document).

The Dossier Submitter considers that **RO1** (general ban on use of lead bullets for sports shooting) is currently not an option because only few alternative bullets of suitable precision are available and the risks from lead bullets in sports shooting can be minimised by using bullet containment, i.e. trap chambers and sand traps. Moreover, it appears that a ban on placing on the market of bullets (even only for sports shooting) would have unintended consequences for non-civilian uses outside the scope of the restriction. Reports from the industry have indicated that the same production lines that serve non-civilian uses also depend on the hunting and sports shooting market to operate economically.

RO2 consists of a ban on the use of lead bullets for sports shooting with a derogation at notified outdoor locations where no agricultural activities take place and specific risk management measures to contain and recover lead bullets are in place. RO2 has four different sub-options, which differ based on the specific risk management measures to be implemented:

- RO2a: Trap chamber, or sand trap (with impermeable barrier) or sand/soil berm (without impermeable barrier), combined with roof or water management system.

- RO2b: Trap chamber, or sand trap (with impermeable barrier), combined with roof or water management system.

- RO2c: Trap chamber, or 'best practice' sand trap with impermeable barrier and roof or permanent cover and water management system.

- RO2d: Trap chamber for static disciplines; AND 'best practice' sand trap for dynamic disciplines.

While the Dossier Submitter considers that all four sub-options are proportionate, it is also noted that they differ in terms of both their costs and effectiveness. Based on the scoring

system used by the Dossier Submitter, option RO2c was identified as the preferred option. The risk management measures of RO2c (trap chambers and 'best practice' sand traps) are required in the CSR for lead (2020), and are implemented within the EU at many, but not all, facilities.

RO3 (compulsory information on the hazards/risks of lead at the point of sale and on product packaging) is not considered effective in reducing lead release by itself but in combination with RO2 it would inform the user about the hazards of lead and the risks of using ammunition at the point of sale ('retailer duty') and through an indelible labelling of the product packaging ('supplier duty') with the information of paragraph 5a of the proposed restriction text. The latter would also support enforcement.

Therefore, the Dossier Submitter concludes that the most effective way to minimise the identified risks would be a ban on the use lead bullets for sports shooting with a derogation at notified outdoor locations where no agricultural activities take place and the measures specified by RO2c are in place (trap chamber, or 'best practice' sand trap with impermeable barrier and roof or permanent cover and water management system). This restriction option should be combined with compulsory information at the point of sale and on product packaging (RO3).

SEAC agrees with the Dossier Submitter that the available information from ammunition manufacturers and stakeholders indicates that RO1 (general ban on use for lead bullets) is currently not yet an option because of the limited availability of alternatives and if alternatives are available these do not always bring the accuracy needed for sports shooting disciplines (especially for small calibres).

Therefore, SEAC agrees to selecting RO2c as the preferred option, because it allows to still use high accuracy projectiles, but will help to limit uncontrolled release of lead into the environment, provided that the recovered lead is either recycled or disposed of in a safe and an accepted manner.

Transition periods

The Background Document proposes a transition period of 6 and 18 months for the retailer duty and supplier duty, respectively, as described in paragraphs 5a and 5b of the proposed restriction text. Because the retailer duty is only to provide visible information at the point of sale, in the opinion of SEAC it can realistically be expected that this can be completed within 6 months after entry into force of the restriction. The supplier duty involves labelling of product packaging. In this case it is realistic to allow more time for printing new labels and selling off the old ones. SEAC has not received information that suggests that 18 months would not be enough for this action.

SEAC notes that already after a maximum period of 18 months after entry into force, shooting ranges should notify use to the respective Member State and cease any agricultural uses at or within the site. This action does not yet imply a decision to potentially plan for an upgrade (see below). SEAC does not expect major difficulties to comply with this transition period.

Regarding the conditional derogation to allow continued use of lead projectiles for sports shooting, a 5-year transition period is proposed to allow for the upgrading of shooting ranges. Provided planning for such actions is initiated early enough (i.e. at the latest after the entry into force of the restriction), the time period indicated seems long enough to implement the changes. SEAC has no information that would suggest otherwise.

D. Fishing (use #7 and 8)

Scope

The scope of the proposed restriction in relation to fishing is focused on the use of lead in fishing sinkers, wires and lures. The scope proposed by the Dossier Submitter includes tackle used for both recreational and commercial fishing irrespective of whether these take place in freshwater (i.e. in rivers, lakes, and ponds), estuarine, or marine environments. In addition, as fishing sinkers can be either purchased from a retailer or manufactured directly by consumers (also known as 'home-casting'), the use of both purchased and home-casted fishing tackle containing lead is in the scope of the proposed restriction.

The lead fishing tackle affected by the proposed restriction can be categorised into three main types:

- Fishing sinkers and wires (also known as 'fishing weights') – covered by use #7
- Fishing lures (including jigs) – covered by use #7
- Fishing nets, ropes and lines where lead is embedded/enclosed in the fishing nets, ropes and lines – covered by use #8

Derived from this, the Dossier Submitter presents the following types of fishing activities:

- Recreational fishing with lead fishing tackle (consumer use)
- Commercial fishing with lead fishing tackle (professional use)
- Home-casting of lead fishing tackle (consumer use)

The main function of lead in fishing tackle is to provide additional weight in order to cast and set the bait or lure at a certain location and distance (up to 200 m, in open sea up to 1 000 m), and/or to sink the fishing tackle, e.g. the line and fishing hook, or the net, while allowing fishing.

The Dossier Submitter proposes a ban on placing on the market and use of lead fishing sinkers and lures, which basically eliminates lead releases and exposures originating from fishing activities. In order to raise awareness among anglers and thus to facilitate the implementation of the ban, retailers are required to provide information on the risks of lead and the proposed restriction to their customers as a complementary measure.

The different transition periods proposed by the Dossier Submitter overall reflect the current market situation. Available information indicates that alternatives for heavier sinkers are less available than for lighter sinkers, supporting a longer transition period for sinkers > 50 g. In general, SEAC agrees with the Dossier Submitter that the requests for longer or shorter transition periods received in the consultation were not sufficiently substantiated to justify a change of the proposal. With regard to fishing wire, the Dossier Submitter proposed no transition period, arguing that alternatives are already widely available in the EU. SEAC notes that comments were received in the consultation indicating that this may not be the case in all Member States (#3512). Further information on potential impacts of the proposed transition periods would be desirable for SEAC to draw a firmer conclusion on the impacts involved.

With regard to sinkers and lures > 50 g, SEAC notes RAC's conclusion that the main risk to be addressed is the risk to human health from home-casting as the risk to birds and other wildlife from ingesting sinkers and lures of this size seems to be very limited. From the risk point of view, RAC does not see sufficient arguments for a derogation of sinkers and lures

made of lead > 50 g from the proposed ban (RO3a HIGH) based on the analysis of restriction options assessed by the Dossier Submitter, although there were no specific data to further determine the risk reduction potential of a ban.

However, SEAC considers the proposed ban of sinkers and lures made of lead > 50 g (RO3a HIGH) may potentially lead to an increase in home-casting of such sinkers and lures if the use of alternatives entails higher costs and/or a lower performance, taking into account the ease of obtaining scrap lead. Even if the use of home-casted lead sinkers and lures is covered by the proposed ban, arguments have been brought forward by Forum that cast doubt on an effective enforcement in the field. A potentially limited effectiveness of a ban combined with the higher costs and a potential decrease of performance of alternatives would support the conclusion that the proposed ban of sinkers and lures > 50 g may not be the most appropriate restriction option in terms of proportionality, in particular if the very limited risk to birds and other wildlife from ingesting sinkers and lures > 50 g is taken into account.

SEAC considers that other measures than a ban, such as by setting the condition that sinkers have to be industrially manufactured, i.e. not home-casted, indicated by a specific marking or coating (as suggested in the consultation #3260) could be more effective to prevent an increase in home-casting. This option was not assessed by the Dossier Submitter, only the unconditional exclusion of sinkers and lures > 50 g as RO3a (LOW) (see below). However, SEAC considers that this option, i.e. a conditional derogation, merits further consideration. To do so, information to assess the technical feasibility and costs of a permanent coating or marking of sinkers and lures as an alternative restriction option would be needed to draw a conclusion on the most appropriate restriction option. Hence, this issue should be specifically highlighted in the consultation on the SEAC draft opinion.

For lead split shots requests for a derogation were received in the consultation (#3202, #3259) pointing to the limited technical feasibility of alternatives. SEAC agrees with the Dossier Submitter that these requests were not sufficiently supported by evidence. In addition, SEAC notes that RAC is not in support of this request for a derogation, because split shot is small, difficult to handle, and easily dropped on the shore where they become available for birds. In this case, too, SEAC would see the need for a specific information request in the consultation on the SEAC draft opinion to gather further information on the availability and technical performance of alternatives and justification for why this performance would result in disproportionate socio-economic impacts. A derogation linked to conditions (spill-proof packaging for individual dosing, shot by shot, and warning notice) may be justified in case sufficient evidence is provided that indicates that banning lead split shots would be disproportionate.

In addition, a request for a derogation of hard-plastic lures (e.g. plugs or jigs) was received in the consultation arguing that it will be very difficult for fishers as well as inspectors to determine whether a hard-plastic lure does contain lead or not. In this regard, SEAC notes that it is uncertain to what extent hard-plastic lures are made with lead and to what extent they contribute to the risk to be addressed. According to the Dossier Submitter there is evidence that lead has already been replaced in these kinds of lures. In order to draw a conclusion on the impacts of including hard-plastic lures in the scope of the proposal further information on the current use of lead would be needed.

Regarding the scope presented in Background Document, SEAC notes a lack of information on the possible use of lead weights in the sport of 'casting'[13], which is derived from angling.

[13] Casting (casting sport) is supervised by the International Casting Sport Federation (ICSF) which was founded in 1955 and as of April 2014 has member associations in 31 countries. The ICSF sponsors tournaments and recognises world records for accuracy and distance. This sport uses common fishing rods with weights or hookless flies and can be held on water or on athletic fields.

No comments on this issue were received in the consultation.

Analysis of Restriction Options

The Dossier Submitter identified for use #7 and use #8 seven restriction options (RO), one of which has two sub-categories.

After a preliminary evaluation, the Dossier Submitter **discarded** the following ROs:

- **RO1** (ban on placing on the market of material and equipment for home-casting activities) as not targeted enough and not enforceable. SEAC agrees with this assessment, as it seems that obtaining lead from any source is easy and there is no special equipment for home-casting. Any camping cooker and a steel frying pan can be used.

- **RO3b** (ban on placing on the market and using fishing nets, ropes and lines containing lead) as being disproportionate. SEAC notes the experience of the Danish Environmental Protection Agency. According to this, a change to steel or zinc weights with a lower specific density would mean about one-third less workspace on deck for professional fishermen. Steel would rust and damage the nets and zinc would pollute the aquatic environment too. SEAC agrees with the Dossier Submitter's assessment that this RO is disproportionate, because according to the current knowledge lead exposure risk (both to human and wildlife) from these types of fishing tackle seems neglectable while nets, ropes and lines not containing lead appear to have technical limitations.

- **RO5** (ban on using lead fishing sinkers and lures) as not implementable and due to enforceability challenges. The enforcement of RO5 would have to be carried out at the sites of use, i.e. fishing spots. REACH inspectors might not be the most appropriate inspectors. The enforcement at the site of uses could be performed by the existing national relevant enforcement authorities for fishing matters. While these inspectors, usually fishers themselves, are used to perform fishing inspections (licence, equipment, fish), it might be difficult, even for skilled inspectors, to distinguish only visually a lead fishing tackle from one made with an alternative metal. A ban only on the use of fishing tackle might therefore be difficult to enforce. SEAC agrees that a ban on use only would be difficult to implement and to enforce in a harmonised way.

SEAC follows this pre-selection from the Dossier Submitter and evaluates the remaining RO as follows:

- **RO2 - Ban on using fishing tackle rig or equipment intended to drop off[14] lead sinkers**: RO2 is focussed specifically on the emerging practice in the EU of the intentional drop off of sinkers ('backlead' or main sinker) for carp fishing, for example. In line with the Dossier Submitter, even though a ban on placing on the market and use would be more effective than a ban on use only, SEAC agrees that a ban on placing on the market cannot be proposed as this would be beyond the scope of REACH which can restrict the use of a substance or the presence of a substance in an article, but not a technique or an object intended to be used with the substance, i.e. the tackle designed to release the lead weight (as it could be used to release a weight of any material). As industrial uses of lead are outside the scope of the proposed restriction, the Dossier Submitter has not considered a restriction option covering the production of 'backlead' or main sinker. For sinkers intended for drop off in water, the Dossier

[14] The drop off practice consists in using a specific tackle or rig in order to detach intentionally the main sinker from the main line (see Figure D.4-9 and Figure D.4-10 in Annex D.4.5.2 of the dossier). The purpose of this drop off is to reduce the weight on the line when landing a large fish, and therefore maximise the catch rate.

Submitter in entry 7c does not propose any transition period. Information received in the consultation supports an immediate ban, therefore SEAC agrees with the Dossier Submitter's proposal.

- **RO3a (LOW and HIGH) - Ban on placing on the market and using lead fishing sinkers and lures**: The distinction of LOW and HIGH refers to the weight limit for sinkers and lures, with RO3a (LOW) applying only to lead fishing sinkers and lures ≤ 50 g and RO3a (HIGH) applying to all fishing sinkers and lures without an upper weight limit. SEAC notes the inclusion of all lead sinkers and lures into the scope (i.e. the HIGH option) and the differentiation into transition periods of 3 years for sinkers and lures ≤ 50 g and 5 years for sinkers and lures > 50 g (see proposed entries 7a and 7b). The cut-off value of 50 g was set because, according to the Dossier Submitter, fishing tackle ingested by birds tends to be below 50 g. Nevertheless, for both weight classes, exposure to humans can occur during home-casting or use (hand-to-mouth exposure). SEAC considers that the analysis would have benefitted from including another option, i.e. a ban on placing on the market and using of sinkers and lures ≤ 50 g and obligatory permanent coating or cover of sinkers and lures > 50 g (see discussion above). SEAC welcomes consideration of RO3a separately from RO3b, because RO3b is about lead embedded in nets, ropes and lines and would unnecessarily burden commercial fisheries with net fishing.

- **RO4 - Ban on placing on the market of lead fishing sinkers and lures**: SEAC agrees with the Dossier Submitter that a ban on placing on the market would not be sufficiently effective, because use of 'home-casted' sinkers and lures would still be possible.

- **RO6 - RO3a with a derogation for lead split shots conditional on the placing on the market in spill proof and child resistant packaging**: So far, the products seem to be available in bulk packed in plastic bags/cartons. Qualified packaging (child resistant and to protect against spillage of large quantities in the environment) would seem to make sense in any case. In addition, a better dosage of these partly very small parts could lead to benefits for the angler. Feedback from the consultation indicated that tungsten kit as alternative to lead split shot is very difficult to work with on very thin fishing lines and that alternative metals damage the thin fishing lines. Therefore, a derogation for lead split shots of sizes 6-14 is requested, also because this part would only represent 0.5% of lead use in the fishery (Annex XV report consultation #3259). SEAC would need more evidence to assess the impacts of a derogation, which may be provided during the consultation on the SEAC draft opinion. However, the transition period for thin fishing lines with lead split shots of sizes 6-14 should be sufficient to allow for the substitution of lead, which was also raised in the consultation (Annex XV report consultation #3202).

- **RO7 - Compulsory information to consumers at the point of sale** (presence, toxicity and risks of lead, as well as availability of alternatives): SEAC generally supports this option as a complementary measure, however its effectiveness still needs to be assessed in more detail (see discussion in Part A above).

  SEAC supports a broad information campaign on the health risks of handling lead because lead for DIY use is likely to be around for a long time as metallic lead seems to be in abundant circulation (e.g. lead sheet from the roofing trade, old rechargeable batteries, remnants of lead piping and sheathing from underground and submarine cables, unrecycled balancing weights from car garages) and because various videos from the home-casting scene (Annex XV report consultation #3325) give an indication that home-casting takes place with little or no risk awareness. As such, SEAC agrees with the Dossier Submitter's recommendation for a voluntary education and action campaign from the sector associations (fishing and trade) targeted to consumers to promote the use of non-lead fishing tackle, and the recovery and recycling of lead

fishing tackle.

The proposed restriction is a combination of RO2, RO3a (HIGH) and RO7, which has been identified by the Dossier Submitter as the most appropriate option.

Regarding use #8 and related to **RO3b** (ban on placing on the market and using fishing nets, ropes and lines containing lead), the Dossier Submitter does not identify any risk to human health or the environment associated with the use of lead in fishing nets, ropes and lines where lead is embedded/enclosed. Noting RAC's conclusion that indeed there is no risk to be expected from this use, SEAC agrees with the Dossier Submitter and notes that the inclusion of use #8 into the scope of the restriction could also lead to a degradation in technical performance:

1. Poorer working environment for the fishers as a result of a reduction of deck space (lead-free sinking lines take up more than one-third more space) and cause more difficult working conditions.

2. Reduced vessel stability as a result of the increased volume of nets, eventually leading to exceeding what is allowed according to rules by e.g. the Danish Maritime Authority.

3. Net damage due to abrasion of material from nets and lines due to rusty and rough steel weights.

3.3.1. Effectiveness in reducing the identified risks

Justification for the opinion of RAC

Summary of proposal:

See RAC opinion.

RAC conclusion(s):

See RAC opinion.

Key elements underpinning the RAC conclusion(s):

See RAC opinion.

3.3.2. Socio-economic impact

Justification for the opinion of SEAC

3.3.2.1. Costs

Summary of proposal:

Approach to impact assessment

The Dossier Submitter carried out separate impact assessments for the different sectors of use concerned by the proposed restriction, i.e. hunting, sports shooting, and fishing. The geographic scope of the impact assessment is the EU as of 2020 (i.e. excluding the United Kingdom) and impacts are considered over a 20-year assessment period. Costs are expressed in Net Present Value (NPV) terms or in annualised form over the 20-year period. A discount rate of 4% was chosen.

Hunting

According to the Dossier Submitter, hunters affected by the proposed restriction would have to switch to alternative gunshot and bullets:

- **Alternatives to lead gunshot for hunting**: The Dossier Submitter concludes that technically and economically feasible alternatives to lead gunshot are available. According to the Dossier Submitter, hunters using steel gunshot can achieve the same results as with lead gunshot, while the current prices for steel and lead gunshot are comparable. Other alternatives, such as bismuth or tungsten-based gunshot, can also be used to replace lead gunshot. They can be used in any shotgun, including vintage shotguns that may not be suitable for use with steel gunshot. Bismuth and tungsten-based gunshot cartridges are however more expensive than lead gunshot cartridges and are also likely to remain more expensive than lead (and steel) gunshot cartridges.

- **Alternatives to lead bullets for hunting**: The Dossier Submitter concludes that technically and economically feasible alternatives to large calibre lead bullets are available. These alternatives are typically composed of copper or brass and, according to the Dossier Submitter, are as effective as and comparable in price to their lead-based counterparts. For small calibre bullets, the Dossier Submitter found that currently only limited alternatives are available in the EU. The Dossier Submitter notes that while non-lead alternatives to small calibre lead bullets (including airgun pellets) do not yet achieve the same level of performance, it has not been unequivocally demonstrated that currently available alternatives are unsuitable for hunting.

Costs have been estimated via the substitution costs incurred by hunters and include operational costs (i.e. costs of alternative gunshot or bullets) and, where relevant, one-off costs in the form of gun testing and replacement:

- **Costs related to hunting with gunshot**: Different scenarios have been considered, which vary according to the extent of any regulation on the use of lead gunshot that already exists, the average price of steel and other alternatives compared to lead gunshot, and the need for testing and gun replacement. Costs in the central scenario have been estimated at €768 million (range: €28-1 310 million) over 20 years.

- **Costs related to hunting with bullets**: Different scenarios have been considered regarding the fraction of hunters already using non-lead bullets. Furthermore, for small calibre bullets, it has been assumed that hunters will have to buy new guns or change barrels, with different scenarios representing different assumptions regarding the extent of gun replacement and barrel changes. For small calibre bullets, costs in the central scenario have been estimated at €122 million over 20 years (range: €54-179 million). For large calibre bullets, costs in the central scenario have been estimated at €239 million over 20 years (range: €101-412 million).

Sports shooting

The Dossier Submitter assessed the possibilities for sports shooters affected by the proposed restriction to switch to alternative gunshot and bullets:

- **Alternatives to lead gunshot for sports shooting**: The Dossier Submitter concludes that alternatives to lead gunshot, in particular steel gunshot, can be used effectively in sports shooting. It is further pointed out that the barriers for further advancing with alternatives are not technical but are rather imposed by the rules of international sports shooting organisations (e.g. ISSF, FITASC) that require lead gunshot to be used and/or have not approved other gunshot material.

- **Alternatives to lead bullets for sports shooting**: According to the Dossier

Submitter's assessment, alternatives to lead bullets (including airgun pellets) exhibit sub-optimal performance in terms of the accuracy required for sports shooting. For muzzle loading guns, the Dossier Submitter notes that various comments from the Annex XV report consultation suggested that no alternatives to lead ammunition would seem to exist.

Costs of the proposed restriction have been estimated either via the substitution costs incurred by sports shooters (for the Dossier Submitter's preferred option for gunshot), the costs related to the implementation of RMMs at shooting areas/ranges (for sports shooting with bullets), or a combination of the two (for the optional conditional derogation for sports shooting with gunshot):

- **Costs related to sports shooting with gunshot**:
    - PREFERRED OPTION: Costs have been estimated via the substitution costs incurred by sports shooters taking into account the costs of alternatives – different scenarios regarding the price differences have been considered – and costs for gun replacement – while not expected to be necessary, as a conservative assumption, the Dossier Submitter still assumes that 10% of sports shooters will replace their gun prematurely (range: 6-14%). Costs in the central scenario have been estimated at €364 million over 20 years (range: €177-596 million).
    - OPTIONAL CONDITIONAL DEROGATION: The Dossier Submitter has considered that a fraction of shooting ranges would upgrade their RMMs to achieve the recovery of more than 90% of the spent lead gunshot, as required in the optional conditional derogation. These ranges would then be accessible to licensed individuals who could continue to use lead gunshot. All other sports shooters would have to switch to alternatives. The costs of implementing RMMs at a fraction of shooting ranges used by licensed individuals together with the substitution costs incurred by all other sports shooters have been estimated in the central scenario at €506-591 million (range: €207-236 million in the lowest scenario to €913-1 044 million in the highest scenario) over 20 years.
- **Costs related to sports shooting with bullets:** In the updated analysis the Dossier Submitter assumes that at all permanent rifle/pistol ranges in the EU, RMMs are already in place to contain bullets for safety reasons. The RMMs are either trap chambers, sand traps (with an impermeable barrier to soil) or sand/soil berms (without an impermeable barrier to soil), and soil berms. Compared to the initial approach, it is now assumed that even current practice will already reduce release of spent ammunition into the environment significantly. Costs have been estimated via the costs for upgrading RMMs to fulfil the requirements of the conditional derogation. The costs for RO2c, the Dossier Submitter's preferred option in terms of RMMs to be implemented (i.e. trap chamber or 'best practice' sand trap), have been estimated in the central scenario at €1 094 million (range: €859-1 329 million).

Fishing

According to the Dossier Submitter, technically feasible **alternatives to lead fishing sinkers and lures** are widely available on the EU market including, for example, bismuth, ceramic/glass, copper and its alloys (such as brass and bronze), concrete, various types of polymers (such as high density polymers, PHA), iron, reinforced bars (rebar), (stainless) steel, stones or pebbles, tin, tungsten, zamac (zinc-aluminium alloy), and zinc.

The costs of the proposed restriction related to fishing have been estimated via the **substitution costs incurred by fishers** from switching to alternatives, assuming that fishers will continue to purchase the same quantity of fishing tackle (in terms of weight) as

today and taking into account the current average price of the alternatives. Costs in the central scenario have been estimated at €9 300 million over 20 years (range: €~0-48 000 million).

Total costs

Table 3 gives a summary of the Dossier Submitter's cost estimates by sector and/or use. The total costs of the proposed restriction across all sectors/uses amount to about €12 billion over the 20-year assessment period.

SEAC conclusion(s):

SEAC considers that the general approach taken by the Dossier Submitter is appropriate to assess the economic impacts of the proposed restriction.

However, uncertainties in the available data may lead to both under- or overestimation of costs reported as central estimates. Therefore, SEAC considers that the costs resulting from the proposed restriction are more reliably reflected by the ranges derived from the cost assessment than by the central estimates.

Key elements underpinning the SEAC conclusion(s):

A. General issues

In the course of the analysis of the calculations performed by the Dossier Submitter, as presented in the Background Document and in additional details supplied to the rapporteurs, some aspects were met that were either not clear to the rapporteurs or where errors may be present. Such cases are further discussed below where needed.

Taking enforcement costs as a general example, SEAC notes that the Dossier Submitter expects these costs to be either zero or up to the standard cost estimate for enforcement typically used in the evaluation of restriction proposals (€55 000 per year). However, SEAC considers that the complexity of implementing and enforcing the proposed restriction may require significantly higher costs. This conclusion is supported by the Forum advice and information submitted in the consultation on the Annex XV report. Consequently, this adds to the uncertainties of the cost estimates provided.

B. Hunting (use #1, 2a, 2b)

In the cost assessment for hunting, the Dossier Submitter took into account the following impacts:

- research and development (R&D) costs
- industry compliance costs
- retailer compliance costs
- enforcement costs
- costs to consumers (hunters)

The main focus on the Dossier Submitter's analysis lies on the costs to consumers (hunters). These are further discussed for gunshot and bullets below. SEAC agrees that the **cost to hunters** is likely to be the most important economic impact to be expected from the proposed restriction. Assuming that at least part of the costs to industry and retailers are passed on in the supply chain these would be reflected in the costs to hunters. However, depending on

market structure and competition, industry may not be able to pass on all costs incurred by the proposed restriction.

With regard to **R&D costs**, SEAC agrees with the Dossier Submitter's conclusion that it is unlikely that the proposed restriction will generate significant R&D costs, because many EU ammunition manufacturers offer non-lead ammunition and thus R&D investment has already been incurred. It is unclear if the proposed restriction will trigger additional R&D spending in response to the proposed restriction.

The overall **costs** of the proposed restriction **to industry** in terms of lost profits depends on the development of the supply of non-lead ammunition by EU manufacturers. If production increased quickly, profits lost to non-EU competitors might be insignificant. The development of EU-production of non-lead ammunition is a major uncertainty. Information received in the consultation on the Annex XV report was not conclusive to substantiate major economic impacts on industry as a result of the proposed restriction (see section 2.5.3.1 in the Background Document). In this regard, SEAC notes that the possible future demand for lead and alternative gunshot in sports shooting significantly depends on the regulatory option taken by the decision-maker: (i) a full ban on placing on the market and use (as preferred by the Dossier Submitter) or (ii) the optional conditional derogation of lead gunshot for sports shooting. If lead gunshot could still be used in sports shooting, it could be feasible for EU manufacturers of steel shot to meet the increased demand in hunting, even earlier than with the 5-year transition period proposed by the Dossier Submitter (see section on Scope). Furthermore, the Dossier Submitter assumes that the growing market for target shooting could partly compensate for potentially lost profits in hunting. However, SEAC considers that the impact of market growth cannot be considered as a compensation per se, because the net impact of lost sales due to the ban of lead gunshot for hunting would still remain. Still, it could alleviate the potential negative impacts of profit losses for industry. In addition, industry might incur other costs, such as raw material costs, energy costs, loss of recycling benefits and manufacturing equipment costs (i.e. capital costs), however there is not sufficient information available to assess their significance.

Similarly, potential **costs to retailers** due to stocks of ammunition that need to be disposed of are likely to be very limited. The scope and transition periods proposed by the Dossier Submitter should allow to sell existing stocks and thus should largely prevent lost sales. In addition, SEAC does not expect that a shorter transition period for the ban of use of lead gunshot in hunting would lead to lost sales, however further information to confirm this assumption would be needed to underpin this conclusion.

The Dossier Submitter expects that the proposed restriction can be enforced by using the same resources (inspectors, testing etc.) as for the restriction of lead gunshot in wetlands. Hence, it is assumed that the proposed restriction will not generate additional **enforcement costs**. SEAC considers that this assumption does not hold, because the geographical area for inspectors to cover is much larger. Therefore, effective enforcement would require additional resources (or otherwise a lack thereof could compromise the effectiveness of the restriction). Based on the information available to SEAC, enforcement costs cannot be assessed in more detail.

All these cost elements were assessed qualitatively. For the economic impact on consumers (hunters) the Dossier Submitter derived quantitative estimates for the use in gunshot and bullets based on available evidence. SEAC notes that the approach to the cost assessment and assumptions made in the cost calculations do not always seem consistent between gunshot and bullets. Also, several uncertainties with regard to the cost figures remain. However, the cost assessment still allows for a conclusion on the overall range of costs to be expected from the proposed restriction.

B1. Hunting with gunshot (use #1)

Availability and technical and economic feasibility of alternative gunshot

Lead can be substituted in gunshot by different materials, most commonly by steel (soft iron), bismuth, tungsten or copper. With regard to their availability and feasibility, SEAC's assessment on alternatives to lead gunshot drawn in its opinion on the restriction proposal of lead gunshot in wetlands (pp. 51-54)[15] is still valid. Steel gunshot is likely to be the most commonly used alternative, because it is widely available and will entail the lowest or even zero costs for hunters who own a standard- or steel-proofed gun. The price data on lead and steel gunshot gathered by the Dossier Submitter substantiates that the price of steel gunshot is comparable to lead.

With regard to technical feasibility, in the Annex XV report consultation (e.g. #3187, #3189, #3194, #3199) it was raised that the use of steel gunshot will lead to crippling losses and animal suffering, because the game is only injured and not effectively killed. It was also stated that the use of steel shot would not be as safe as lead gunshot, because of an increased risk of injuries from ricochet. SEAC notes that these statements were not substantiated by further information. Available scientific evidence does not support a loss in killing efficiency or an increased risk from ricochet.

Some hunters will still switch to other alternatives, e.g. bismuth or tungsten, which are much more expensive than lead or steel, because these materials can also be used in guns that are not standard-proofed, for which steel shot is no feasible alternative. Furthermore, bismuth and tungsten are very similar to lead with regard to ballistics and shooting performance meaning that shooters do not need to adapt to new shooting conditions as they have to when switching to steel. As bismuth and tungsten are much more expensive compared to steel, SEAC considers that the number of hunters switching to these alternatives is likely to be very limited. Instead, hunters may choose to buy a new steel-proof gun. This conclusion is supported by comments received in the consultation on the Annex XV report (#3246, 3331).

SEAC notes that the production of some of the alternative materials considered, e.g. bismuth, entails significantly larger environmental impacts in terms of resource use and greenhouse gas emissions than lead (see Background Document Annex C.4).

Cost assessment

The cost assessment is based on the same approach as well as largely on the same assumptions applied in the restriction proposal on the use of lead gunshot in wetlands[16]. The Dossier Submitter updated available information sources and also reflected information received in the call for evidence during the preparation of the proposal as well as the consultation by updating several assumptions made in the assessment.

Accordingly, the **costs to hunters** resulting from the proposed restriction consist of (i) operational costs due to switching to alternative ammunition and (ii) one-off costs to test or to replace existing guns necessary to use alternative gunshot.

As data on the input parameters to estimate costs are limited, the Dossier Submitter had to make several assumptions based on available evidence or plausibility considerations (see Table 5). To reflect the uncertainties underlying these assumptions and to illustrate the range of costs expected to result from the proposed restriction, the Dossier Submitter defined three

[15] https://echa.europa.eu/documents/10162/07e05943-ee0a-20e1-2946-9c656499c8f8

[16] SEAC's assessment and conclusions for the restriction in wetlands are also largely applicable (see link above, pp. 50).

different cost scenarios (best, central and worst case).

Table 5: Cost scenarios assessed by the Dossier Submitter to substitute lead gunshot in hunting (including variation on the central scenario by SEAC)

Input/Output	Best case	Central case - SEAC	Central case - DS	Worst case
Number of hunters impacted in terrestrial hunting	3.6m (60% of all hunters)	equal to DS	3.8m (65% of all hunters)	4.1m (70% of all hunters)
Relative price of steel shot	100%	equal to DS	101%	103%
Proportion switching to steel shot (remaining hunters are assumed to switch to bismuth or tungsten)	100%	**95%**	85%	85%
Number of shotguns to be replaced in terrestrial hunting (% of hunters affected)	0	equal to DS	190 073 (5%)	413 252 (10%)
One-off cost for premature replacement of shotguns	€0m	equal to DS	€132m	€424m
Annual operational cost (i.e. annual incremental cost to be spent on shot)	€0m	€25m	€72m	€122m
Annualised one-off cost for testing	€3m	equal to DS	€2m	€1m
Annualised one-off cost for new guns	€0m	equal to DS	€10 m	€20m
Total annualised cost to hunters	**€3m**	**€37m**	**€84m**	**€143m**
Total cost (20 years)	**€28m**	**€342m**	**€768m**	**€1 310m**

The Dossier Submitter in general made conservative assumptions with regard to the input parameters used. More specifically, SEAC has the following observations:

- Number of hunters affected: The Dossier Submitter assumes that all hunters that were not covered by the restriction of lead gunshot in wetlands[17] would be affected by the ban. SEAC considers this a conservative assumption, which tends to overestimate the number of affected hunters, because not all hunters might pursue hunting with gunshot, some may exclusively use bullets depending on the kind of game hunted for. The number of hunters using gunshot is likely to depend on the abundance of small game (incl. birds) in the respective region, which has declined significantly for some species in recent years[18], in particular in terrestrial areas.

- Number of lead cartridges used: The Dossier Submitter assumes that lead gunshot accounts for 90% of all gunshot cartridges currently used in hunting (outside of wetlands). SEAC considers that this share could decrease once the wetland restriction will have entered into effect, because hunters may switch to using steel shot in

[17] The restriction in wetlands was assumed to cover waterfowl hunters as well as all hunters in Member States with a complete national ban and with more than 20% wetlands of the total area.

[18] See, for example: REIMOSER, F. & REIMOSER, S. 2016. Long-term trends of hunting bags and wildlife populations in Central Europe. *Beiträge zur Jagd- und Wildforschung,* 41**,** 29-43.

general, i.e. also outside of wetlands.

- Relative price of steel shot: The updated market analysis carried out by the Dossier Submitter underpins that the price of steel gunshot is the same or can even be lower than lead. Still, the Dossier Submitter assumes a slightly higher price in the central-case scenario.

- Proportion of different alternatives used: The alternatives hunters would use to replace lead is an important driver of the costs of the proposed restriction. In the central-case scenario the Dossier Submitter assumes that 15% of hunters would switch to other alternatives than steel, i.e. bismuth and tungsten, which are much more costly. SEAC considers it unlikely that this share would be as high, in particular over the whole 20-year period, because of the high price of bismuth and tungsten. This conclusion is supported by information received in the consultation (#3246, 3331), which indicates that hunters would rather choose to replace their gun than to use other alternatives than steel. In addition, availability of alternatives like bismuth or tungsten could become limited with increasing demand. To ensure that the central scenario is based on realistic and not overly conservative assumptions, SEAC adapted the proportion of alternatives used to 95% steel and only 5% bismuth/tungsten (see Table 5). Based on this assumption, the cost estimate for the central scenario changes from €768 to €342 million. Furthermore, the Dossier Submitter reflected the possibility that hunters who cannot use steel shot would replace their gun instead of using other alternatives than steel in a sensitivity scenario of the central cost estimate (see next bullet point).

- Guns to be replaced in response to the proposed restriction: In the consultation on the Annex XV report comments were received stating that the Dossier Submitter had underestimated the costs of gun replacement resulting from the proposed restriction (e.g. #3331, #3467). In response to these comments, the Dossier Submitter scrutinised the issue by conducting a sensitivity analysis on different drivers of gun replacement costs, i.e. number of hunters affected, share of guns to be replaced and price of a new shotgun (see section 2.5.3.1.1 in Background Document). If the results of this sensitivity scenario are considered in addition to the original cost assessment (Table 5) the gun replacement costs range between €0 and €170 million.

B2. Hunting with bullets, incl. airgun pellets (use #2a and 2b)

Availability and technical and economic feasibility of alternative bullets

Several types of non-lead bullets are available, made with different materials, mainly from copper and brass (see analysis in the Background Document Annex C.1.2). Information presented in the Background Document shows that the availability of alternatives varies between calibres. For large calibres (≥ 5.6 mm) non-lead ammunition is widely available, whereas market supply is more limited for small calibres (< 5.6 mm) (see Background Document Annex D.1.2.2.7). Many comments were received on the suitability and availability of alternatives to lead bullets (see summary of comments received in section 2.5.1.2.1 in the Background Document). These did not change the conclusion of the Dossier Submitter on this issue. SEAC agrees with this analysis of the information received.

SEAC considers that the limited supply of alternatives for small calibre centrefire as well as rimfire ammunition could be a result of low demand and might change with increasing demand. However, available evidence supports that currently the technical performance of alternatives is indeed limited in terms of precision. It is unclear what exactly the impacts of this performance loss are and how it will develop until the entry into force of the proposal. Therefore, SEAC supports a review of the proposed restriction for small calibre/rimfire ammunition as proposed by the Dossier Submitter.

With regard to the technical feasibility of non-lead large calibre bullets, scientific evidence

presented by the Dossier Submitter indicates that in general they are as effective as lead provided that the projectile design is adapted to the lower density of alternative materials compared to lead (see Background Document Annex D.1.2.2.2). SEAC notes that standards set for lead bullets in hunting legislation can act as an obstacle for the use of non-lead projectiles, because these may not achieve the minimum weight required.

Alternative ammunition to be used in airguns (usually zinc alloy) are available. However, these alternatives lack performance in terms of precision. There is only very limited information available to conclude to what extent hunting with airguns is affected by this lower performance. In addition, the price of non-lead airgun pellets is reported to be significantly higher compared to lead.

Cost assessment

The **costs to hunters** of the proposed restriction primarily depend on (i) the number of lead bullets that are currently used in hunting, (ii) the price difference between lead bullets and alternatives and (iii) the number of rifles that will be replaced or re-barrelled in response to the proposed restriction. To estimate these parameters the Dossier Submitter used available data such as hunting bag statistics, an analysis of market prices of lead and non-lead ammunition as well as information on the technical and economic feasibility of alternative ammunition.

Table 6: Cost scenarios assessed by the Dossier Submitter to substitute lead bullets in hunting

Input/Output	Scenario		
	Best case	**Central case**	**Worst case**
Share of hunting with lead-free bullets	15%	10%	5%
Small calibres			
Relative price of non-lead alternatives	± €0	+ €0.2	+ €0.4
Annual operational cost	€1m	€1m	€3m
Number of rifles to be replaced/re-barrelled	178 393	267 590	535 180
One-off cost for premature replacement of rifles/barrels	€66m	€165m	€366m
Annualised one-off cost for new rifles/barrels	€5m	€12m	€17m
Total annualised cost to hunters	€6m	€13m	€20m
Total cost (20 years)	**€54m**	**€122m**	**€179m**
Large calibres			
Relative price of non-lead alternatives	+ €0.75	+ €1.46	+ €2.17
Annual operational cost	€8m	€20m	€34m
Total cost (20 years)	**€101m**	**€239m**	**€412m**

Similar to the assessment for gunshot, also the assumptions made by the Dossier Submitter to estimate the costs to replace lead bullets tend to be conservative. In detail, SEAC notes the following:

- Number of lead bullets used: In the absence of data, the Dossier Submitter made assumptions on the share of hunting that is already carried out with non-lead bullets. SEAC considers that the share of non-lead bullets in hunting could be at the upper end of the range assumed in the assessment based on the fact that in some Member States it is already significantly higher. With regard to the number of small calibre bullets used, some assumptions made, e.g. the share of small game hunted with bullets (compared to shot),were not substantiated by the Dossier Submitter meaning that it

is difficult for SEAC to conclude if they are reasonable and appropriate to reflect the range of possible impacts resulting from the proposed restriction.

- Price difference lead and non-lead bullets: The market analysis of lead and non-lead ammunition carried out by the Dossier Submitter generated rather scarce data for small calibre ammunition. Even though SEAC acknowledges that this reflects the limited availability of alternative small calibre bullets, it could compromise the reliability of the price estimates for small calibre non-lead ammunition, in particular as commonly used calibres such as .22 LR were not included. For large calibres, the Dossier Submitter assumed that the price for non-lead ammunition is significantly higher compared to lead based on the results of the market analysis. SEAC notes that other available information sources indicate a more moderate price difference or even similar price levels of lead and non-lead ammunition[19]. Therefore, the price levels used by the Dossier Submitter in the cost assessment seem to overestimate the costs of switching to non-lead bullets.

- Rifle or barrel replacement: The Dossier Submitter assumes that rifles using rimfire bullets either need to be replaced or re-barrelled. SEAC notes that there is no clear evidence that rifles or barrels would have to be replaced in response to the restriction and that this would be required for technical reasons. Also, comments received in the consultation on the Annex XV report did not provide information that would allow for a conclusion on the likelihood of these impacts (see discussion on the input received in the consultation in section 2.5.3.1.2 of the Background Document). Hence, it is uncertain if and to what extent replacement costs will result from the proposal.

The Dossier Submitter did not assess the costs resulting from the proposed restriction of lead in airgun pellets. This is an uncertainty in the cost assessment, which might affect the cost ranges provided in the Background Document. Overall, SEAC considers it to be unlikely that the costs resulting from the ban in airgun pellets would lead to significant changes in the cost ranges.

C. Sports shooting (use #3, 4, 5, 6)

Implementation of the restriction (possibly including derogations) would cause different types of costs to various actors in society, including the manufacturers of firearms and ammunition, the individual sports shooters, and the owners/operators of shooting ranges, as well as national shooting associations and probably national sports associations in general.

The Dossier Submitter has analysed various impacts of the implementation of the proposed restriction. This was helped by extensive information obtained from sports shooting associations and own research into the availability and price of various types of ammunition. In the Background Document the analysis of technical aspects for the use of alternative ammunition mainly focussed on hunting. However, most of the conclusions can be transferred to sports shooting as well. For good order the discussion below is split in a part related to gunshot and in a part related to bullets and other type of ammunition.

C1. Sports shooting with gunshot (use #3)

Availability and technical and economic feasibility of alternative gunshot

In terms of availability and feasibility of alternatives, SEAC's assessment of the use of gunshot in hunting (see above) is transferrable to the situation in sports shooting. Accordingly, steel gunshot is likely to be the most commonly used alternative, because it is available, technically

[19] Ellis, Matt (2019): Availability and price of non-lead ammunition, BASC

feasible and – if at all – only slightly more expensive compared to lead gunshot. In the Annex XV report consultation, it was confirmed that steel gunshot is already commonly used in competitive sports shooting at national level (e.g. #3189). The latest data available indicate its price will be comparable to that of lead shot, although price and availability may vary depending on the region.

A recurring point of discussion is if the undeniable differences between steel shot and lead shot are so severe that they will prevent general use of steel shot in sports shooting, which in this case mainly relates to different variations of clay target shooting. In international competitions the use of lead shot is still mandatory. In the consultation on the Annex XV report many comments were received which made statements pro and contra this matter. Moreover, the internet contains many reports about personal experiences. Especially, a voluntary ban on the use of lead shot announced in the United Kingdom has created a lot of comparative testing, both for hunting and clay target shooting. In general, these tests show that initial scepticism gave rise to a much more positive opinion in the end. This matches the experiences made in other countries that have been using steel shot already for a longer period of time. On the other side of the spectrum is the data submitted by FITASC/ISSF (#3221), where numerical data is supplied about differences in ballistics and other parameters, with the conclusion that steel shot is not suitable for high-level sports shooting. Consequently, there do not seem to be any initiatives that may lead to a change in the rules of international competitions.

A summary of the various points brought up in the discussion is listed below (see also Table 2-38 in the Background Document for more information):

1. Damage to the gun because of abrasion: The argument that steel will damage the gun barrel does not seem to hold in view of its proven use in guns produced after about 1970. Moreover, any abrasive action of steel is prevented by the use of modern plastic wads. In addition, the availably and use of biodegradable wads seems increasing. This is confirmed by practical experience, even with relatively old guns.

2. Damage to the gun because of high pressure: To compensate for the lower density of steel pellets (leading to a faster deceleration after they leave the gun muzzle) powder charges need to be higher, leading to a higher pressure during firing of the gun. Abundant experience has shown that for modern guns the use of standard steel cartridges presents no problem. However, high-performance cartridges with an extra load should only be fired from a modern gun with a fleur-de-lys sign. Provided this is taken care of, no problems are to be expected. For clay target shooting at a certain level, the use of a modern gun seems a given. However, in some cases recreational shooters may have to replace an old gun.

3. Higher recoil and noise if steel shot is used: A higher powder charge in the case of steel will inevitably lead to a stronger recoil and a louder bang when firing the gun. FITASC/ISSF presented numerical data on this and claim this will harm the health of the shooter and cause problems with permits of shooting ranges and is therefore not acceptable. Although these issues are mentioned in many other sources comparing lead and steel shot, none of the countries that have a long-term experience with the use of steel shot seems to consider these differences to be so severe that they would prevent the use of steel shot. Problems with noise emissions of shooting ranges using steel shot have not been reported in countries already using steel shot, but it cannot be excluded that these may exist in some cases.

4. Different pattern of steel shot vs. lead shot: The different mechanical properties of steel pellets will cause a difference in spreading out after the pellets leave the gun, which may influence its hitting characteristics. However, there is ample evidence that the choice of a suitable choke (a narrowing of the gun barrel at the muzzle end that

allows to control the spatial distribution of the gunshot after it leaves the barrel) will allow to reach a suitable pattern.

5. Difference in ability to destroy a target: The lower density of steel shot will cause the pellets to lose velocity faster than in the case of lead shot. However, experience from practice shows that with the right choice of cartridge, the ability to break a clay target is still sufficient.

6. Less accuracy with steel: The lower density of steel will cause a higher sensitivity towards wind deflection[20]. It is clear that this makes it necessary to adjust the aiming if one wants to hit a moving target (be it a game animal or a clay target). For sports shooting this may give rise to a certain period of intensive training to internalize the new aiming movement and become as proficient as before. The argument brought by FITASC/ISSF that accuracy of steel cartridges decreases to an unacceptable level beyond 30 metres is put in doubt by a test performed by an experienced clay target champion, who demonstrates that even on a windy day he is still able to hit consistently at distances of over 100 metres, although some adjustment is needed[21].

In conclusion, SEAC tends to agree with the Dossier Submitter who has concluded that the main barrier preventing a general switch towards the use of steel shot does not seem to be of technical nature, but mainly organisational. The way to resolve this difference in assessment of suitability of steel shot for clay target shooting can only be found if the shooting associations and people from practice combine their experiences in order to come to a final answer.

Cost assessment

The various factors contributing to costs for sports shooting can be described as follows:

1. Cost of R&D into development and testing of non-lead ammunition types by gun and ammunition manufacturers and possibly new or modified firearms: For sports shooting with gunshot, this will be very similar to hunting. So, no extra R&D costs in this direction are expected, because modern guns are capable of firing steel shot already. While it is possible that in the future modern guns can be improved even more, making them even better suited to use steel gunshot, this can be considered as normal product development and innovation and should not be counted as costs of this restriction.

2. Costs for manufacturers and retailers which have to broaden their range of products (different materials, larger stocks, limited shelf-life, etc.): Also here there will be close parallels to hunting. The Dossier Submitter argues that these costs will be minor or non-existent because the situation does not really differ from that of today. However, in the Annex XV report consultation some comments were received that refer to a higher risk of corrosion for steel shot and therefore potentially a shorter shelf-life. SEAC considers the information presented is of insufficient quality to determine whether this would indeed be the case.

3. SEAC assumes that costs for enforcement of a full ban on placing on the market and on use will largely be covered by the usual enforcement costs, as argued by the Dossier Submitter. Because sports shooting takes place at specific sites, the argument which was used by SEAC in the section on hunting sector that higher enforcement costs may be caused because of the need to cover a wider geographic area, does not seem valid

[20] https://www.knsa.nl/de-knsa/accommodaties/schieten-met-loodhagel-op-kleiduiven/ (in Dutch)

[21] https://www.youtube.com/watch?v=NI1DLfzOzk8&t=240s

here.

4. If the costs of the optional conditional derogation are considered (assuming this option would be taken forward by the decision-maker), the situation becomes more complicated, because regulatory/enforcement authorities are supposed to implement and check a permit/licence system both for shooting ranges and individuals as well as inspections in the field on the non-use of lead gunshot for hunting. Moreover, it is not clear if issuing and checking permits/licences would be done by the same government entities as the "in the field" enforcement. Potentially this may increase costs. It remains unclear to SEAC if costs related to such a permit/licence system would be negligible or need to be taken into account as well. The potentially complicating issue about the involvement of different government entities is also mentioned in the Forum advice.

5. Costs to individual sports shooters:

    a. As one-off costs, as some guns may have to be replaced or modified in order to be able to fire steel shot or need to be re-tested to confirm their safe use with this kind of non-lead ammunition. Although the available information indicates that for use of steel gunshot in most cases a replacement will not be necessary, it cannot be excluded that in some cases (e.g. an old type of gun) users may choose to replace the existing gun earlier than originally planned. For sports shooting, replacement costs are presented in Table 2-43 of the Background Document and in the calculation details supplied to SEAC. However, in view of the above information, the assumption that 10% of sports shooters may need to replace their gun seems to be rather high and may therefore overestimate costs. SEAC notes that the Dossier Submitter included also scenarios where 6 and 14% are replaced.

    b. For a total ban, the Dossier Submitter calculates total costs of €264-660 million as costs over 20 years to prematurely replace guns, depending on the number of guns that need to be prematurely replaced and the price of a new gun. On an annualised basis, this corresponds to costs of €19-49 million. If it is assumed that under the optional conditional derogation about 12 000 out of 2 500 000 sports shooters would qualify for a licence to use lead on permitted sites (so would not have a need to replace their gun), replacement costs would be slightly lower but still in the same range.

        In these calculations, the Dossier Submitter uses a price range of €1 000-3 000 for a new gun. Taking into account that a gun is typically used for a long time, the Dossier Submitter states that these costs seem affordable for an individual shooter.

        It is likely that for sports shooting at an advanced level, models at the higher end of the range will be preferred. On the other hand, it should be assumed that active sports shooters are likely to already possess a modern gun, reducing the probability that a new purchase will be necessary. Effectively this means that with high probability the gun replacement costs presented by the Dossier Submitter will be an overestimation of reality.

        Moreover, costs for equipment in international competitions are often paid for by sponsors or by subsidies. This would mean that part of replacement costs will not be at the burden of the individual but of society as a whole.

    c. In some cases, costs will be incurred for renewed proofing of an old gun (about €70) and change of choke (about €70). Compared to the costs for replacing guns, these costs are expected to be of minor importance and SEAC

acknowledges these were not explicitly considered in the analysis.

d. Extra costs for steel gunshot in comparison to the traditional lead-based shot types: In the detailed calculations for the area of sports shooting with gunshot provided to SEAC, the Dossier Submitter estimates these extra costs to amount to a mid-value of about €63 based on 10 000 shots at a 1% higher price for steel shot compared to lead (or a range of €0-126, assuming respectively 0 and 3% higher price for steel shot compared to lead shot). Recent information seems to indicate that currently there hardly seems to be any price difference between lead and steel shot. So, it may be that these costs are overestimated and in reality will be close to zero. In the most recent calculations on the costs of the different restriction options, a mid-price difference of 1% was used.

   SEAC notes that for sports shooters a shift to bismuth- or tungsten-based shot does seem an even less attractive option than for hunters. Sports shooters tend to use a higher number of cartridges per year than hunters. In view of the much higher price for this type of shot, a switch to such alternatives is an unattractive option.

   The SEAC rapporteurs note that it remains unclear if the manufacturing sector will be able to meet fast increasing requirements for steel shot at the transition period indicated, or whether there may be a transient shortage of such ammunition types. In this case, higher prices may result, at least temporarily.

6. In case the optional conditional derogation to allow further use of gunshot by licensed athletes at permitted sites would come to bear, costs will be incurred by owners/operators of shooting ranges that implement additional RMMs to achieve a lead recovery rate of more than 90%, in addition to the substitution costs incurred by all other sports shooters. Note that it is likely that all or part of the costs for upgrading RMMs will directly or indirectly be passed on to people using the facility. In case national sports associations or government agencies would step in to subsidise such upgrades, extra costs would be incurred by society as a whole instead. The Dossier Submitter's calculations are further discussed in the following sub-section.

Costs for additional RMMs related to gunshot used in sports shooting (relevant in the context of the optional conditional derogation)

Estimating impacts here is difficult because there is no central EU register of shooting ranges and their measures for risk management. Annex B.9.1.3 (Table B.9-4) of the Background Document gives an overview of information gathered from Member States on the number of shooting ranges in these countries. Based on this information, the Dossier Submitter estimated the total number of shotgun shooting ranges that would be concerned by the proposed restriction at 4 000-5 000 ranges. However, it should be taken into account that some countries did not report data at all and others reported data that are known to be inaccurate because there are no accurate national data available.

Other than for some specific sites in a few Member States, it is unknown to what extent these shooting ranges have already introduced RMMs to control release of lead into the environment.

To be able to calculate the costs of implementing the necessary measures foreseen under the optional conditional derogation, the Dossier Submitter first assigned the 4 000-5 000 shotgun ranges to four groups, where for each group a low and a high figure is assumed:

1. Temporary areas without relevant RMMs (no lead recovery).

2. Permanent ranges without relevant RMMs (lead recovery < 50%). To satisfy the

optional conditional derogation extensive modifications are necessary.

3. Permanent ranges with some RMMs (lead recovery 50-90%). These will need some modification to increase the level of lead recovery).

4. Permanent ranges with extensive RMMs (lead recovery > 90%). No further modifications foreseen.

It should be noted that each range will have baseline costs that will occur independent of the introduction of the restriction. These are not included in the calculations. An overview of the number of sites assigned to each of the four groups can be found in Table 2-51 of the Background Document.

Based on numbers from some real-life examples and estimations, each range type is assigned certain costs to implement the necessary RMMs. This is summarised in Table 2-50 in the Background Document), which takes into account data that has been received from stakeholders in the Annex XV report consultation.

The Dossier Submitter estimated that upgrading all shotgun ranges where RMMs that allow the recovery of > 90% lead are not available (i.e. except permanent ranges will extensive RMMs in place to recover > 90% lead) would amount to investment costs of €3.5-4.4 billion (central scenario, NPV over 20 years at 4%). While this is lower compared to the numbers presented in the originally submitted Annex XV report (€8 527 million, central scenario, NPV over 20 years at 4%), the Dossier Submitter noted that this estimate is not considered realistic because it also includes costs for the upgrade of temporary shooting areas/ranges which is not expected to happen in practice. More generally, the Dossier Submitter considers it reasonable to expect that a restriction with the optional conditional derogation would not affect all ranges and shooters evenly and that in reality only a certain fraction of shooting ranges would upgrade their RMMs. In fact, many comments from the Nordic countries in the Annex XV report consultation indicated that many (especially small local) ranges would not be able to afford implementation of the proposed RMMs. They would then have the option to go for a "lead free status" or to close.

Therefore, based on comments from the Annex XV report consultation and on the Dossier Submitter's own research, the Dossier Submitter used an alternative approach to calculate the number of ranges that may upgrade RMMs in order to arrive at a more realistic cost estimate[22]. This approach is based on a regional distribution of shooting ranges in the EU. In this modified calculation, based on a regional breakdown following the NUTS classification for Europe (NUTS = "Nomenclature des unites territoriales statistiques") an important assumption is that in each Member State only a certain number of ranges on a regional level will upgrade their RMMs.

In a first version of this approach, corresponding to RO3 for sports shooting with gunshot (i.e. not the restriction option eventually proposed by the Dossier Submitter for the optional conditional derogation, see Section 3.3 for details), it is assumed that in each region at least one shooting range will be available that will be open to all shooters that want to continue using lead shot. Implicitly this assumes that there will be enough of such upgraded sites available so that each shooter can easily reach such a site in his/her region. Because this may not always be the case, it is also assumed that 10% of shooters may choose to switch to steel shot instead, in order to practice at a range which will not upgrade but opt for a "lead free status".

In a second version of this approach, corresponding to RO4 for sports shooting with gunshot

[22] The Dossier Submitter provided the Rapporteurs with spreadsheets detailing these calculations.

(i.e. the restriction option eventually proposed for the optional conditional derogation, together with RO5,), it is assumed that a smaller number of sites will upgrade RMMs to meet the conditions of the derogation and that these sites will only be accessible for licensed sports shooters who would be allowed to continue using lead gunshot. All other shooters would have to switch to using steel shot and use ranges that are lead free. This would still allow shooters to train in their region for international competitions but would limit the overall costs associated with need to comply with the requirements of the optional conditional derogation.

An overview of the number of ranges expected to be upgraded under the different approaches is given in Table 2-52 in the Background Document).

This approach of upgrading only a fraction of ranges on a regional basis would then result in the cost estimates shown in Table 7 (based on data presented in Table 2-54 in the Background Document). In addition to the costs of upgrading RMMs, the Dossier Submitter considers costs of switching to steel shot for 10% of sport shooters in the calculations corresponding to RO3 and for all sports shooters without a permit in the calculations corresponding to RO4 (also shown in Table 7). This results in a central cost estimate of €1 097 million (range: €885-1 309 million) for RO3 and €548 million (range: €506-591) for RO4. The latter is also reflected in the summary of the Dossier Submitter's cost estimates above (Table 3).

Table 7: Costs of implementing RMMs and switching to steel shot (NPV over 20 years at 4%)

Scenario	**Costs of implementing RMMs to recover > 90% lead gunshot and costs of switching to steel shot (€ million)**					
	low-cost scenario		**middle-cost scenario**		**high-cost scenario**	
	Low	**high**	**low**	**high**	**low**	**High**
All shooting ranges upgraded (except permanent ranges with all RMMs in place)	RMMs: 1 192	RMMs: 1 490	RMMs: 3 481	RMMs: 4 351	RMMs: 5 343	RMMs: 6 678
Fraction of ranges upgraded to be used by all sports shooters (corresponding to RO3)	RMMs: 148 Steel: 18 **Total: 166**	RMMs: 296 Steel: 18 **Total: 314**	RMMs: 849 Steel: 36 **Total: 885**	RMMs: 1 273 Steel: 36 **Total: 1 309**	RMMs: 1 973 Steel: 60 **Total: 2 033**	RMMs: 2 630 Steel: 60 **Total: 2 690**
Fraction of ranges upgraded to be used by licensed individuals only (corresponding to RO4)	RMMs: 30 Steel: 177 **Total: 207**	RMMs: 59 Steel: 177 **Total: 236**	RMMs: 170 Steel: 336 **Total: 506**	RMMs: 255 Steel: 336 **Total: 591**	RMMs: 395 Steel: 518 **Total: 913**	RMMs: 526 Steel: 518 **Total: 1 044**

SEAC agrees that this representation of the distribution of potential upgrades gives a better picture than just assuming all ranges will upgrade their RMMs. However, in SEAC's view, it should be noted that at least for some large area countries, upgrading only a fraction of ranges on a regional basis may mean much longer travel times for shooters, because such countries may contain very large regions. It is unclear what consequences this will have for the number of sports shooters that need to practice at a certain level and how this will influence the organisation and popularity of the sports shooting disciplines involved in the various Member States.

From the available data it is clear that a change to alternative steel shot ammunition will always be more economical than implementing the required RMMs to reach > 90% lead recovery, except for those shooting ranges that have already now implemented the necessary RMMs.

C2. Sports shooting with bullets, incl. airgun pellets (use #4, 5, 6)

Availability and technical and economic feasibility of alternative bullets

Even though non-lead rifle ammunition is available for hunting, its technical performance is not sufficient to be suitable for sports shooting, because it does not achieve an equivalent level of accuracy. This is convincingly demonstrated in several contributions to the consultation on the Annex XV report (e.g. #3239).

Cost assessment

Because in the proposed restriction, use of lead bullets would still be allowed, if used on a site with appropriate RMMs in place, which is notified to the respective Member State, some aspects of the cost picture look different from sports shooting with gunshot:

1. Cost of R&D into development and testing of non-lead ammunition types by gun and ammunition manufacturers and possibly developing new or modified firearms: Because no new guns or ammunition would need to be made available, no extra costs are foreseen in the short term. However, stakeholders may perceive this derogation as open for challenge in the future, with the perspective that sooner or later new regulations may emerge that will further tighten the use of lead ammunition. With this in mind, it may be that gun and ammunition manufacturers will resume or intensify their investigations in finding a replacement for lead in bullets, both from the perspective of ammunition and from the type of gun used. However, SEAC does not find it justified to assign any such costs to the present restriction.

2. Costs for manufacturers and retailers which have to broaden their range of products (different materials, larger stocks, limited shelf-life, etc.): Because existing products can be used in the future, no costs will occur. As in the previous point, the situation for the longer term may be less clear, but does not have to be considered further at this stage.

3. Cost of enforcement: SEAC assumes that costs for enforcing a ban on use will largely be covered by the usual enforcement costs for shooting ranges, as already argued by the Dossier Submitter and discussed for gunshot above.

4. Costs to individual sports shooters: For the same reasons as mentioned above no direct costs are to be expected, other than those related to the mandatory use of notified sites. SEAC notes that if implementation of the restriction would significantly reduce the number of sites for shooting with lead bullets, this may cause a shift in membership of shooting clubs or may necessitate longer travel distances of members to reach such a site. SEAC considers the impact of this issue, although not addressed by the Dossier Submitter, to contribute to the uncertainties of the proposal.

If at a certain point in time, further regulatory action (e.g. a review of this restriction) would still make it necessary to purchase a new gun. Internet searches indicate that prices for new guns (also including biathlon) may be rather high – at least higher as for hunting and gunshot shooting. However, SEAC does not consider evaluation of such costs at this moment relevant for this discussion.

5. Costs for additional RMMs related to bullets used in sports shooting (relevant in the context of the conditional derogation): The Dossier Submitter proposes a conditional derogation for lead bullets, allowing further use at notified sites with measures in place for lead projectile containment and recovery. Compared to the original Annex XV report, the Dossier Submitter has made significant changes both in the proposed restriction for sports shooting with bullets and in the assessment of the associated impacts.

   In Section 2.6.3.2 of the Background Document, the Dossier Submitter has examined the costs of the proposed restriction option (RO2c) as well as other assessed options (RO2a, RO2b, RO2d) by calculating the impact of the change from RMMs implemented in the baseline to RMMs of higher effectiveness (upgrade) as required by the respective option. The presence of a basic berm structure is taken as a given for each shooting range. Costs related to this structure are not taken into account.

   Based on input from the Annex XV report consultation, Table 2-55 in Section 2.6.3.2 of the Background Document gives an overview of the best estimates of the costs associated with the implementation of various projectile containment measures. These vary from €400 for the installation of a simple bullet trap to > €100 000 for sand traps that cover a number of stands. In addition, based on the available input, costs for maintenance and decommissioning, as well as installation of a water management system are estimated. However, for some elements (e.g. decommissioning costs of best practice sand traps) no cost information is available and values are estimated (low and high range given).

   To calculate the economic impact, estimates of the number of ranges in the EU (outside Germany where the highest standard of RMMs is already in place), taking into account their standard of RMMs implemented in the baseline, are combined with the estimates of upgrading to a higher standard of RMMs as required by respective restriction option. The outcome is presented in Table 2-56 of the Background Document, which is reproduced below (Table 8) for ease of reference, for the four sub-options RO2a-RO2d. RO2c represents the Dossier Submitter's preferred option for which costs are estimated at €1 094 million (range: €859-1 329 million) over 20 years.

Table 8: Costs of upgrading RMMs to achieve the standard required by the respective restriction option (NPV over 20 years at 4%)

Restriction option		Estimated number of ranges affected	Costs to change RMMs (million €)
RO2 **Ban on the use of lead bullets for sports shooting with a derogation at notified outdoor locations where no agricultural activities take place and the following measures are in place (see different RO2 options below):**			
RO2a	Trap chamber, or sand trap (with impermeable barrier) or sand/soil berm (without impermeable barrier), combined with roof or water management system	2 440	170 (72-271)
RO2b	Trap chamber, or sand trap (with impermeable barrier), combined with roof or water management system	7 200	435 (212-662)
RO2c	Trap chamber, or 'best practice' sand trap with impermeable barrier and roof or permanent cover and water management system	7 880	1 094 (859-1 329)
RO2d	Trap chamber for static disciplines; AND 'best practice' sand trap for dynamic disciplines	8 000	1 656 (719-2 653)

The Dossier Submitter recognizes that in some areas (e.g. Sweden and Finland) shooting ranges may be located in or next to wetlands and considers that for such shooting ranges RMMs with the highest effectiveness to minimize risks to surface water, soil and groundwater should be installed.

The Dossier Submitter shared details of the calculations with the SEAC rapporteurs. SEAC concludes that compared to the assessment presented in the initially submitted Annex XV report, these calculations are more refined and probably a better representation of reality. Nevertheless, SEAC cannot agree with some aspects of the calculations. In particular, in SEAC's view the Dossier Submitter does not correctly account for the remediation costs of the existing sites as costs resulting from the restriction. Moreover, discounting of the investments related to the installation of RMMs is not used consistently. A recalculation by the rapporteurs for the preferred option RO2c showed some elements go up in costs while others decrease. So for this particular option the resulting differences in total costs are not significant (i.e. < 6%).

Unintended consequences for the availability of sites for military training purposes have been mentioned before and are discussed as an uncertainty in section 3.4.2 below.

Other types of guns using lead-based ammunition (use #5 and 6)

Although the use of lead projectiles in airgun shooting and in the use of muzzle loading guns is within the scope of the restriction, not enough data are available to perform a similar cost assessment for these uses. For muzzle loaders (either antique or replicas), use of lead for bullets seems without alternatives as discussed in several comments received in the Annex XV report consultation (e.g. #3201, #3224, #3235). As already indicated in the *Scope* section above, additional data has been submitted in the consultation on the amount of lead used for muzzle loading guns. However, as long as these are used on the same designated sites as lead bullets, they would fall under the same regulation.

For airguns, information that is available suggests that alternatives may be available for uses other than sports shooting. Insofar as for these guns lead based pellets are used for sports shooting, it is supposed that the same measures proposed for sports shooting with bullets would also control releases from airgun shooting.

D. Fishing (use #7 and 8)

The use of lead fishing tackle is widespread in Europe despite its well documented hazard properties and adverse effects on both wildlife and human health. In terms of lead placed on the market, the Dossier Submitter estimates that fishing tackle accounts for 18 900 tpa, of which 5 400 tpa comes from lead in fishing sinkers and lures. The Dossier Submitter estimates that 1 300 tpa originate from the manufacture of sinkers and lures in the EU while the remainder is imported. The quantity of lead placed on the market in fishing nets, ropes and lines is estimated to be 13 500 tpa.

The Dossier Submitter estimates that of the 44 000 tonnes of lead dispersed in the environment every year, on average 4 725 tonnes/year are derived from fishing tackle. The study by Radomski et al. (2006)[23] cited by the Dossier Submitter illustrates the order of magnitude for the individual, with an estimated loss of at least 165 g lead/year/angler.

Availability and technical and economic feasibility of alternatives in fishing

The Dossier Submitter identified five properties that make metallic lead suitable for use in fishing:

- relative density (compared to water at 4 °C) is D4R = 11.45, making it a heavy metal,
- the relatively low melting point 326 °C, making it suitable for "home-casting",
- the low water solubility at 185 mg/L at 20°C,
- easy mechanical deformability, e. g. when fixing a slit shot ball on the fishing line with tongs, and
- metallic gloss for use as a lure due to its similarity with other fish.

Some fishing tackle consists solely of lead, for example sinkers, while in lures, lead has been added to obtain additional functions, such as to attract the fish. Lead is also added to give sufficient weight to the lure in the water. Lead fishing sinkers and lures, which may be lost or discarded in aquatic (freshwater and marine) or terrestrial environments, range in weight from 0.01 g to 4.8 g (≤ 0.06 g are often referred as 'dust split shots') to several kilograms (e.g. downrigger marine weight to catch strong fishes).

According to cited literature of the Dossier Submitter by VLIZ (Flanders Marine Institute) and the Swedish Chemicals Agency (KEMI), the ideal lead alternative (i.e. suitable alternative) should:

- not contain heavy metals such as lead, or zinc, that are toxic to the wildlife,

[23] The Dossier Submitter cites in the annex of the Annex XV report a study by Radomski et al. (2006). The study estimated the amount of lead lost in five Canadian large lakes using angler interviews to derive some of the assumptions used for the estimation. The angler survey was conducted directly after the fishing trip. For five different categories of lead fishing tackle the loss per hour was estimated (large sinkers, split shots, jigs, lures and hooks). The yearly average fishing tackle loss for every angler was on average 15 fishing lead items with an average weight of 11 g per lost item, that is at least 165 g lead/year/angler.

- match ideally the mass density of lead (11.34 g/cm³) which contributes to the optimal casting (fishing) properties,
- should be biodegradable, and
- the production process also ideally needed to offer perspective on the (future) elaboration of a do-it-yourself (DIY)/home-casting method.

The Dossier Submitter summarised alternative substances for lead in fishing tackle: bismuth, ceramic/glass, copper and its alloys such as brass and bronze, concrete, high density polymers, iron, reinforced bars (Rebar), (stainless) steel, stones or pebbles, tin, tungsten, zamac (zinc-aluminium alloy), and zinc. In general, the alternatives currently available for fishing tackle are better than lead from a human health and environmental standpoint.

However, some of them are not recommended (as stated by RAC) because of aquatic toxicity (copper, zinc), or being critical raw materials with a concerning environmental footprint (tungsten and bismuth).

This means the large list shrinks on closer inspection because some alternatives seem not available on the EU market or because of environmental concerns (e.g. zinc, brass, thermoplastics with metal powder fillers). Additionally, there are some data gaps for zamac, zinc, ceramic, tin and bismuth, which makes a full comparison difficult.

Table 9: Possible alternative substances for fishing sinkers and lure, price index compared to lead (=1.00)

Material	**Remark**
Bismuth alloy (3-6% tin)	Alloy with tin reduce the frangibility of the bismuth, the density of bismuth (100 % Bi: 9.8 g/cm^3) is similar to lead fishing tackle; melting point: 271 °C - home-casting possible, price index: no data
Tin	Widely used as an alternative for lead split shot fishing sinkers because its softness and ductility/malleability; with 7.3 g/cm^3, tin is not as dense as lead and therefore the tin weights would be larger; melting point 232 °C - home-casting possible, price index: 8.99
Bronze (copper with up to 40 % tin)	Bronze more corrosion resistant than brass (copper with 5 % zinc, sometimes associated with lead); bronze is a very soft metal with high strength; depending of tin content, the melting point and density is between 800 and 1000 °C and 7.7-7.8 g/cm^3, home-casting seems possible, price index: 0.69
Stainless steel	Pure iron is forming iron oxide (rust), stainless steel is less dense (7.9 g/cm^3) than lead, comparable with tin but more brittle as tin, no home-casting, price index: 1.19
Tungsten	Successfully used as a replacement for lead for some fishing tackle applications, density 19.3 g/cm^3, no home-casting with melting point 3.422 °C but tungsten putty available, price index: 15.42
Ceramic/Glass	Less dense (2-6 g/cm^3) than lead and therefore ceramic fishing tackle is larger than lead ones, material seems not useful for DIY processing, seldom marketed in EU, price index: no data
Stones or pebbles	Alternative by Belgian fishers for carp fishing especially in soft or muddy bottoms, density 1.6 g/cm^3, individual processing in DIY possible, price index: no data
High density polymer	Thermoplastic-based formulation with metallic fillers and resins with density up to 11 g/cm^3, very close to the lead one, tungsten, for example, may be used as a filler, composite may be a source of micro plastic, price index: no data

For the alternative substances investigated, the Dossier Submitter reports on regulatory activities that are currently ongoing for copper:

- ED under assessment as Endocrine Disruptor
- CLH: copper granulated: Aquatic Chronic 2 (15th ATP) shall apply from 1 March 2022

SEAC also notes that copper is an approved (approval in progress) active substance under Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products (BPR), here in product type 21 (antifouling).

For this reason, SEAC considers that the suitability of copper (pure) and brass (alloy copper/zinc) as drop-in alternatives are limited.

SEAC expects that technically feasible alternatives to lead in fishing sinkers and lures are available. The materials seem available for industrial production as well as for DIY. The cost of the alternatives for the fisher depends on the material. For example, for simple weights, the cost can range from free (i.e. for stones) to sinkers made of tungsten with a price almost 16 times higher than lead.

The most common lead substitute in, for example, Belgian fishing shops (Annex XV report consultation #3217 and #3325) is tungsten. This material has a specific mass (19.25 g/cm³) that far exceeds that of lead (11.34 g/cm³), which makes it a good lead substitute from a practical point of view. The high price compared to lead explains its limited use. Tungsten (pure) is considered less toxic than lead, but the grade practically used contains toxic nickel and cobalt. The material is not chemically inert and the actual environmental impact seems still unclear.

Of the possible alternatives, only tungsten has a higher density than lead. As a result, future sinkers will tend to be larger in volume than today's lead sinkers. Where the volume gain interferes, tungsten with a density of 19.3 g/cm^3 and bismuth with a density of 9.8 g/cm^3 would be available. Where volume gain is critical, SEAC considers that the choice of feasible materials to substitute lead is limited, which may complicate switching to alternative sinkers.

Tungsten metallic seems reserved for industrial processing for fishing sinkers and lures because of its extremely high melting point and hardness. Bismuth and tin can be considered available for DIY applications and especially for home-casting.

Feedback from the consultation (#3207, #3217) suggests that iron powder embedded in a biodegradable plastic (polyhydroxyalkanoates (PHA) or polyhydroxy fatty acids (PHF)) should also be considered as an alternative. These are naturally occurring water-insoluble and linear biopolyesters formed by many bacteria as reserve materials for carbon and energy, which are biodegradable and are used to produce bio-based plastics. SEAC is missing public information on this alternative, especially on market availability and prices.

Casting tests (Annex XV report consultation #3217) with alternative fishing weights (iron powder with polyhydroxyalkanoates (PHA) binder; mass density of ~5 g/cm³; 3D volume enlargement of approximately 25%) was found to reduce casting distance by 5% in tailwinds and approximately 10% in headwinds. Regarding flow interaction, the same study did not find a negative correlation between flow interaction and flow velocity at the time of angling.

In the consultation, the coating of lead was raised as another option in addition to using alternative materials (e.g. #3518, #3260). The Dossier Submitter concludes that this option is not effective, because available information indicates that so far protective coatings have

failed to sustain the conditions of the gizzard of birds. SEAC considers that further information on the technical feasibility of enclosing lead permanently to prevent exposure would be desirable to draw a firm conclusion on this option (see discussion under scope).

Cost assessment

Central to the cost estimates are the Dossier Submitter's assumptions on the extent of EU production of lead fishing sinkers and lures as well as the number of recreational fishers. Based on interviews undertaken with several EU producers and retailers, the Dossier Submitter assumes that there are four EU manufacturers of lead fishing sinkers and lures with a global market, placing between 150 and 400 tpa on the market. In addition, it is assumed that there are ten EU manufacturers with a local market, each placing on the market circa 50 tpa. The built-in assumption for home-casting is that in every EU country (except Denmark where a ban is already in place), approximately one tpa of lead fishing sinkers and lures is manufactured. Thus, the central assumption is that 1 300 tonnes of lead fishing sinkers and lures are produced in the EU every year.

The Dossier Submitter estimates that there are 23 million recreational fishers in the EU, of which 73% are freshwater fishers while the remainder engage in marine fishing[24]. These assumptions are based on contacts with various fishing associations as well as literature and internet searches.

The Dossier Submitter estimates that the total cost of the proposed restriction option is €9.3 billion (NPV over a 20-year analytical period). The following broad categories of costs were taken into account to estimate the costs of the restriction within the EU:

- R&D costs

European companies that are currently manufacturing lead fishing tackle will incur R&D costs if they wish to develop alternative technologies. No information was provided on this topic by stakeholders via the Call for Evidence; however, during the ECHA market survey, information was provided by some stakeholders (mainly retailers and manufacturers) on the costs of previous attempts to develop alternatives to lead fishing tackle, and estimated costs of future R&D.

The Dossier Submitter recognizes that effort and capacity required for R&D will vary depending on the size and market (global vs local) of the EU manufacturers as well as their capacity to invest in R&D. The Dossier Submitter assumes a cost of €75 000 (€50 000-100 000) for European manufacturers with a global market (EU market at least), and a cost of €5 000 for manufacturers with a local market (own country/region) between entry into force of the restriction and the end of the first transition period. This results in an annualised cost for the industry of €22 000 (or NPV of €299 000). It is assumed that R&D costs form part of the overall industry compliance costs. In response to SEAC questioning, the R&D costs estimated by the Dossier Submitter were revised upwards slightly.

- Industry compliance costs

The Dossier Submitter assumes that the industry compliance costs are essentially the reformulation costs and, thus, are strongly linked to the selected alternative(s) to replace lead in fishing tackle. These costs include raw material costs, energy costs, loss of recycling benefits and manufacturing equipment costs (i.e. capital costs). For example, manufacturers would incur higher costs than is presently the case if the price of the alternative raw material is higher than that of lead or if changes to the manufacturing process are required such as

[24] The Dossier Submitter assumes that 10% of fishers are below the age of 12.

the need for new moulds or higher energy costs. The Dossier Submitter assumes that the same machinery will be used for the manufacturing of lead and non-lead fishing tackle[25], and that only different moulds and melting temperatures will be used.

Capital costs are driven by the extent to which new moulds are required and this, in turn, is driven by the replacement rate for different types of moulds (i.e. steel/iron moulds have a much higher melting and casting temperature, as well as a longer life than silicone moulds).

Compliance costs are estimated to be €148 million (NPV), of which:

- R&D costs: €0.3 million
- Cost of switching to silicone moulds: €0.1 million
- Cost of switching to steel moulds: €7.6 million
- Cost of purchasing alternative raw materials and associated energy costs: €140 million

Following SEAC questioning, including a query on the assumed price for one of the alternative raw materials (zamac), compliance costs were revised upwards slightly by the Dossier Submitter.

- Retailer compliance costs

These are costs associated with implementing the restriction condition at point of sale and are assumed to be zero. The Dossier Submitter considers that such costs would be part of the normal business and maintenance of the shops/websites. The transition to non-lead fishing tackle is assumed to have no additional cost for the retailers in terms of stock, or loss of profit since fishing tackle is not expected to remain on shop shelves for a long time. The proposed transition period would give enough time for retailers to switch to non-lead alternatives and sell their stocks of lead fishing tackle.

While retailers and suppliers will not be asked to label or re-label individually all the fishing tackle they sell, it is expected that retailers provide an information 'corner', or a poster sufficiently visible, understandable and in the national language of the customer that would raise awareness and consciousness of the customer. It is assumed that this, in turn, will induce a change of behaviour.

- Enforcement costs

It is assumed that REACH enforcement authorities would conduct spot checks of imported fishing tackle (customs), manufacturers' site inspections, retailers' site inspections, and retailers' website inspections at the end of the transition period. The cost of this includes staff time, laboratory testing, overheads and other inspection-related expenses. In addition, the proposed restriction option would allow inspections at the site of use (e.g. on fishing spots) to be performed as well by the national relevant enforcement authorities. The Dossier Submitter assumes that the costs for enforcement authorities and industry will be ca. €55 000 per year for the duration of the analytical period (20 years). This figure represents the standard cost for enforcement assumed for restriction proposals. However, the Dossier Submitter highlights that this is likely an overestimate in this case: the enforcement costs of such a restriction would likely be incurred in the years following the entry-into-effect and

[25] The Dossier Submitter assumes that the cost of new machinery would be significant and, as such, if new machinery were to be required, other industrial actors already equipped with such machinery would take over the market.

would approach zero by the end of the analytical period as compliance increases.

- Consumers and commercial fishers' costs

The Dossier Submitter assumes that once the restriction enters into force, fishers will continue to purchase the same quantity of fishing tackle as today (based on Danish[26] and UK[27] experience). Thus, 5 400 tpa (4 000-10 000) of fishing sinkers and lures would still be purchased yearly in Europe after the full entry into force of the restriction. The costs for the fishers during the 20-year analytical period take into account:

(i) the transition period proposed for the different sizes of fishing sinkers and lures. This period is assumed to be three years for those ≤ 50 g and five years for those > 50 g;

(ii) the current distribution of sinkers' sizes (those ≤ 50 g are assumed to represent 55% of the market while those > 50 g are assumed to be 45%);

(iii) the current average price of the alternatives versus the current average retail price for lead.

The current average price of alternatives is derived from the ECHA market survey and mystery shopping exercise. The latter resulted in almost 1 000 unique data entries representing 40 brands. As a result, in the central scenario, the price per tonne for alternative sinkers and lures ≤ 50 g is estimated by the Dossier Submitter to be €324 000. For the low and high scenarios, the Dossier Submitter applies the 5-95% percentile which generates a price range of €23 000 - €1.5 million. For alternative sinkers and lures > 50 g, the central cost is considered by the Dossier Submitter to be €43 000, lying within a range of €14 000-285 000. It is assumed that lead sinkers and lures ≤ 50 g retail at €30 000 per tonne while those over 50 g cost retail at approximately half that.

The assumed price of lead sinkers and lures in the central scenario is based on discussions held between the Dossier Submitter and some of the main manufacturers in Europe.

Having discussed these ranges with the Dossier Submitter, SEAC understands that the lower and upper bounds represent an extreme scenario: i.e. all alternatives (bought by fishers) would either be the cheapest or the most expensive one. Thus, the Dossier Submitter acknowledges that these lower and upper bounds are not realistic but were used for sensitivity analysis and allowed for the calculation of a cost-effectiveness range[28].

The current, relatively expensive, prices of alternatives are noteworthy. This is partly attributed to the cost of raw materials and the associated manufacturing processes. However, the Dossier Submitter explains that there seems to be a significant mark-up within the supply chain for some of alternatives which are marketed as 'lead-free', 'non-lead' or 'non-toxic'. The Dossier Submitter expects a decrease in the selling price of alternatives as demand increases and as more alternatives become available on the market.

Based on a literature review, the Dossier Submitter assumes that recreational fishers fish on average 15 days per year, incurring total annual expenses relating to fishing of €1 000. The average yearly expenses per fisher for the sinkers and lures only is estimated to be €100. The Dossier Submitter estimates that the additional expense per fisher per fishing day as a

[26] 2002 ban on import and sale of fishing tackle for angling with lead concentration > 0.01%.

[27] 1987 ban on the import and sale of fishing weights between 0.06 g and 28.35 g.

[28] The lower bound in this case would imply cost-savings since the cheapest alternatives have lower prices than lead.

result of this restriction is €2.

The Dossier Submitter assumes the costs incurred by manufacturers of alternatives will be passed onto consumers through increased prices (experience from the UK and Danish bans shows that this was the case). Thus, the compliance costs, including R&D expenses, and retailer costs should not be counted in addition to the consumer costs.

The Dossier Submitter's central cost estimate of €9.3 billion (range €0-48 billion) for recreational fishers is driven mainly by the cost of replacing lead fishing sinkers and lures ≤ 50 g, which is estimated to be €8.7 billion. The cost of replacing those > 50 g is assumed to be €575 million.

A summary of the cost estimates of the proposed restriction within the EU is shown in Table 10.

Table 10: Cost estimates of the proposed restriction related to fishing within the EU

	Total costs (€) NPV – 20 years	Annualised costs (€)
Cost for fishers	**9 300m**	**680m**
of which:		
EU industry compliance costs (including R&D)	148m	11m
EU retailer compliance costs	0	0
Enforcement costs	0.5m	0.04m

- Other costs

As well as the costs that are monetised, the Dossier Submitter notes that there are other possible costs associated with the restriction. For example, there is a risk that it might not be feasible for EU global and local manufacturers to make the switch to the production of non-lead fishing tackle. Consultations between the Dossier Submitter and manufacturers have indicated that if there is no/too short a transition period, global manufacturers would lose half of their revenue and would have to lay off up to half of their staff. For local businesses, it is expected that most of them would be forced into permanent closure. The Dossier Submitter estimates that up to 100 workers in the industry could lose their job. Since many of these workers have relatively low levels of educational attainment it may be difficult for them to find alternative employment.

There could also be an initial cost for those for whom home-casting is a secondary source of income if alternatives are more expensive than lead or if they cannot easily switch to the use of alternatives. However, since such additional sources of income are not always declared to the tax authorities, this potential impact is not considered further.

Another potential cost noted by the Dossier Submitter is that the proposed restriction option could lead to an increase in the incidence and frequency of home-casting of lead fishing tackle, and the associated exposure to children, if the price of non-lead fishing tackle in shops/on web stores rises, and if enforcement at the point of use is not effective.

Finally, the Dossier Submitter suggests that the proposed restriction option could create a

littering effect in the environment because of inevitable loss of fishing tackle, which is inherent to the fishing practice, but will depend on the type of alternative used. The cost of this is not discussed further.

Conclusions related to the cost assessment for fishing

SEAC acknowledges that there is a lack of information available with regard to some elements of the costs and thus, a precise estimation of the total cost of the proposed restriction for the EU is difficult to achieve.

SEAC tends to agree with the general approach taken by the Dossier Submitter in assessing the fishing related costs of the proposed restriction, given the available information. SEAC notes that it has not been possible to monetise all of the possible costs and, as a result, the actual cost of the proposed restriction might be higher than that suggested here. SEAC agrees with the Dossier Submitter that the estimates, nevertheless, are useful in that they can be considered in terms of an order of magnitude.

With regard to enforcement costs, the Dossier Submitter assumes that the costs for enforcement authorities and industry will be ca. €55 000 per year for the duration of the analytical period (20 years). However, as already mentioned, in reality, the enforcement costs of a new restriction would likely be incurred in the years following the entry-into-effect and would approach zero by the end of the analytical period. Thus, SEAC would have welcomed a more realistic estimation of these costs, showing the decreasing trajectory, over the 20-year period. However, SEAC notes that these costs represent only 0.01% of the total estimated costs.

While SEAC acknowledges that retailer compliance costs will be small given that no relabelling is required, SEAC does not agree that these costs should be assumed to be zero, since the provision of posters/informational signs that are required in order to comply with the restriction will incur a cost that will fall on the retailers. More information regarding the size of such an "informational corner" would have been welcome. SEAC acknowledges, however, that such a cost would not significantly affect the overall cost as currently estimated.

In response to SEAC questioning on the exact number of assumed manufacturers in Europe with a global market and the assumed price of one of the included alternatives (zamac), both the compliance costs and the estimated raw material costs were revised by the Dossier Submitter.

In estimating the costs, it is SEAC's view that the Dossier Submitter implemented appropriate information from consultations with the market through its call for evidence and the ECHA market survey, conducted a thorough literature review and carefully considered the experience from other countries where similar bans have been implemented. SEAC questioned the very large ranges that were applied to the price of alternative sinkers and lures but finds plausible the Dossier Submitter's explanation that these are considered extreme and were applied for illustrative purposes. Thus, SEAC agrees with the Dossier Submitter that the prices applied in the central scenario represent the most plausible estimate of the costs, since it is likely the alternatives bought by the fishers in the future will consist of a wide variety of available alternatives. SEAC is of the view that the Dossier Submitter applied the most appropriate methodologies in order to assess the costs of the proposed restriction.

SEAC agrees with the Dossier Submitter that it is likely that costs incurred by manufacturers of alternatives will be passed onto consumers through increased prices and so, should not be double counted. SEAC also acknowledges the experience of those countries where bans are already in place and agrees that the current price of relatively expensive alternatives should reduce over time as demand and competition increase.

3.3.2.2. Benefits

Summary of proposal:

According to the Dossier Submitter, a conclusive quantification of the benefits expected from the proposed restriction is not possible for most sectors due to the lack of data and the non-threshold character of lead with regard to adverse effects on children (neurotoxicity). Instead, the Dossier Submitter considers releases of lead to the environment as a proxy for risk and complemented this analysis wherever possible with a quantification of benefits (avoided mortality of birds, IQ loss in children, and chronic kidney disease in adults).

The Dossier Submitter estimates the proposed restriction to result in a cumulative emission reduction of approximately 633 000 tonnes of lead over the 20-year assessment period (see Table 3). This represents a reduction of 72% of the quantified emissions of lead that would have occurred in the absence of the proposed restriction.

These avoided emissions will contribute to prevent further lead accumulation in the environment and thereby avoid mortality and sub-lethal effects in birds and other wildlife as a result of lead poisoning via primary and secondary routes. The Dossier Submitter partially monetised the mortality of birds from primary ingestion of lead gunshot indicating an annual avoided loss of €114m (central estimate).

Regarding human health, the Dossier Submitter states that the most important impacts relate to the protection of children in households that frequently consume game meat. It is estimated that a ban of large-calibre lead bullets and lead gunshot could avoid IQ loss of ≥ 1 IQ point in about 7 000 children per year, corresponding to an avoided welfare loss of roughly €70 million per year. Furthermore, the Dossier Submitter estimates that the risk of chronic kidney disease (CKD) would be reduced in about 1 150 individuals, valued at €7.5-75 million per year.

A summary of these and other benefits of the proposed restriction is given in Table 11.

Table 11: Summary of benefits of the proposed restriction

Main impacts identified	Uses contributing to impacts	Benefits quantified?
Environment		
Avoided poisoning of wildlife (birds)	Hunting with gunshot (use 1) Hunting with bullets (uses 2a, 2b) Sports shooting with gunshot (use 3) Outdoor shooting using airguns (use 5) Fishing sinkers and lures (use 7)	**Quantified**: Avoided mortality of > 1m birds per year from primary ingestion of gunshot, valued at €114m; 135m birds at risk of primary poisoning from gunshot and 7m from fishing tackle; 14m birds at risk from secondary poisoning (all types of ammunition) **Not quantified**: Avoided sub-lethal effects on birds; effects on other wildlife
Avoided risks to soil, surface water and groundwater	Sports shooting with gunshot (use 3) Sports shooting with bullets (use 4) Outdoor shooting using airguns (use 5) Other outdoor shooting (use 6)	No
Avoided poisoning of livestock	Sports shooting with gunshot (use 3) Sports shooting with bullets (use 4) Outdoor shooting using airguns (use 5) Other outdoor shooting (use 6)	No
Positive impact on wildlife, ecosystem, and associated leisure activities (including protection of wildlife species with critical conservation status)	Hunting with gunshot (use 1) Hunting with bullets (uses 2a, 2b) Fishing sinkers and lures (use 7)	No
Overall positive impact expected based on the environmental footprint of the	All (uses 1-7)	No

alternatives		
EU Birds Directive, CMS and AEWA commitments fulfilled	All (uses 1-7)	No
Human health		
Avoided exposure to lead via consumption of game meat	Hunting with gunshot (use 1) Hunting with bullets (use 2b)	IQ loss: €70m per year CKD: €7.5-75m per year
Avoided exposure to lead from home-casting	Fishing sinkers and lures (use 7) Hunting with bullets (use 2b) Other outdoor shooting (use 6)	No
Avoided exposure to lead from sports shooting (lead dust)	Sports shooting with gunshot (use 3) Sports shooting with bullets (use 4) Outdoor shooting using airguns (use 5) Other outdoor shooting (use 6)	No
Avoided exposure to lead (via the environment) from drinking water and food	Sports shooting with gunshot (use 3) Sports shooting with bullets (use 4) Outdoor shooting using airguns (use 5) Other outdoor shooting (use 6)	No

SEAC conclusion(s):

In principle SEAC agrees that the approach taken by the Dossier Submitter to use the releases of lead avoided as a proxy for the benefits of the restriction is a viable option to assess the benefits of the proposed restriction taking into account the lack of data to quantify the impacts of lead use on the environment and human health.

Nevertheless, SEAC considers that the benefits resulting from lead emissions avoided are likely to depend on the particular use of lead in hunting, sports shooting and fishing, and the specific risks arising from this use, e.g. primary or secondary ingestion by birds, the particular species affected, lead exposure of children via game meat consumption or contamination of soil and groundwater. This conclusion is supported by the qualitative risk assessment carried out by RAC, which indicated different probabilities and severities of the possible risks of the use of lead in outdoor shooting and fishing.

SEAC would like to emphasise that the unquantified benefits of the proposed restriction are likely to be significant. In this respect, it is important to note that the monetised values estimated by the Dossier Submitter only reflect a part of the impacts of the use of lead in outdoor shooting and fishing and as such should be interpreted as an illustration of the benefits of the proposal but not as a comprehensive estimate.

Key elements underpinning the SEAC conclusion(s):

A. Impacts of lead use in outdoor shooting and fishing

Environmental impacts

The main environmental impact of lead use in outdoor shooting and fishing is the primary and secondary poisoning of birds leading to increased mortality as well as sub-lethal effects. According to the Dossier Submitter, 135 million birds are at risk of primary poisoning from lead gunshot and seven million birds because of ingestion of fishing sinkers and lures. In addition, 14 million birds are at risk of secondary poisoning from all types of ammunition.

For assessing the impact of primary poisoning, i.e. via the direct uptake of lead gunshot or fishing tackle by birds, the Dossier Submitter adopted a similar approach as applied in the

restriction proposal on lead gunshot in wetlands[29]. The assessment includes an estimate of the annual value of mortality of birds avoided for 17 species (see Background Document Annex D.5.1) based on the replacement costs of 1.2 million birds dying of lead poisoning after direct ingestion of lead gunshot.

SEAC considers that this quantitative estimate only covers a part of the total impact on birds, for the following reasons:

- Not all relevant bird species included: Not all species prone to direct ingestion of gunshot are covered by the assessment. As supported by RAC, 41 bird species are considered to be at risk of primary lead poisoning from gunshot.

- Impacts of secondary poisoning not included: Mortality of birds due to secondary poisoning was not quantified. However, with 14 million birds at risk from 29 species, including several threatened or endangered species, this impact is likely to be substantial. There is ample evidence confirming the socio-economic impacts of secondary poisoning on raptors and scavenging birds (Pain et al., 2019).

- Impacts of fishing tackle not included: Seven million birds may also be affected by lead poisoning from ingesting fishing tackle, including 22 water bird species. These impacts were not quantified by the Dossier Submitter.

- Impacts of sub-lethal effects not included: Sub-lethal effects, such as physiological or behavioural effects, could have negative consequences on bird populations, especially for threatened or endangered species where population sizes are small.

- Valuation of mortality of birds: The impact on birds was monetised based on market prices of captive-bred birds assuming that these would be released to compensate for the loss due to lead poisoning in order to maintain hunting opportunities. It is uncertain to what extent current market prices reflect the total value of the birds affected by lead poisoning to society. SEAC considers that it is very likely to be lower than the marginal willingness-to-pay. As market prices relate to the use of birds for hunting purposes, other benefits may not be reflected, for instance, the contribution of birds to the functioning of ecosystems. Hence, the market price data used only captures part of the total value of related birds to society.

In addition to the avoided impacts on birds, it is also important to consider further positive impacts in order to account for total environmental benefits of the proposed restriction, i.e. (i) impacts on other wild species (other than birds), e.g. mammals, and livestock (ruminants) (ii) prevention of soil and groundwater contamination and related remediation costs, as well as (iii) the contribution of the proposed restriction to ecosystem health in general and all related services.

Human health impacts

Humans are exposed to lead originating from outdoor shooting and fishing via two main exposure routes: food and inhalation. The different uses covered by the proposal contribute to the main health impacts identified by the Dossier Submitter (neurotoxicity in children and chronic kidney disease in adults) to varying degree.

Based on EFSA data on the lead content in game meat, the Dossier Submitter estimated the human health impacts that will be avoided by implementing the proposed restriction and monetised these benefits using established methodologies (value of IQ loss for neurotoxicity,

[29] For details, see SEAC's opinion pp.59-63: https://echa.europa.eu/documents/10162/07e05943-ee0a-20e1-2946-9c656499c8f8

value of DALYs for chronic kidney disease). RAC overall supports the quantitative risk assessment provided by the Dossier Submitter, which forms the basis of the human health impact assessment.

The monetised impact of IQ loss avoided estimated by the Dossier Submitter does provide an indication of the socio-economic consequences of lead contamination of game meat. However, SEAC underlines that the figure estimated does not present a precise and robust quantification of these consequences due to the following limitations and uncertainties:

- Blood lead levels: RAC confirmed a large variability in the game meat lead levels and recent evidence (Pain et al., 2022) suggests higher lead levels in small game than the levels estimated by the Dossier Submitter based on EFSA data.

- Correlation between blood lead levels and IQ: In addition to the EFSA Benchmark Dose Levels (BMDL) used by the Dossier Submitter, there are models that indicate IQ loss at much lower BMDLs (see RAC opinion).

- Population included: The Dossier Submitter quantified IQ loss for children up to 7 years of age in the assessment. Unborn children, which are most sensitive for neurotoxic effects resulting from lead exposure, are not covered by the assessment.

- IQ loss covered: The Dossier Submitter assumed an IQ loss of 1 point for those children exposed to or above the equivalent blood lead level. Potential higher IQ losses are not accounted for.

- Valuation of IQ loss: The value of IQ loss is monetised based on the expected decrease in lifetime earnings. The Dossier Submitter assumes a value of one IQ point of €10 000 based on Lin et al. (2018). SEAC notes that in other recent scientific publications (e.g. Remy et al., 2019) this value is assumed to be nearly twice as high. Furthermore, it does not include other potentially relevant impacts, such as costs for additional educational measures.

Moreover, it is important to note that the value of IQ loss does not capture all impacts of neurodevelopmental effects resulting from lead exposure. For instance, social and behavioural consequences, such as antisocial behaviour, criminal behaviour, violence are also relevant when assessing the social costs entailed (Grandjean and Landrigan, 2014).

With regard to the impact on CKD in adults, the range of values estimated can be considered as an indication of the benefits to be expected, similarly as for IQ loss. However, SEAC agrees with the Dossier Submitter that the estimates are likely to be less robust, because basic assumptions (the use of EFSA BMDLs) tend to contribute to an overestimation of impacts (as confirmed by RAC).

Inhalation of lead fumes or dust takes place during the production of fishing tackle or bullets for shooting at home ('home-casting'). There is no conclusive information available on the extent of home-casting activities within the EU. Therefore, it is not possible to quantify the respective health impacts. The Dossier Submitter expects that the proposed restriction will prevent future home-casting as it bans the use of lead fishing tackle as well as bullets for hunting.

Another exposure route of humans to lead from outdoor shooting identified is via food and drinking water, which contains lead through soil and groundwater contamination from shooting ranges. SEAC notes that, according to RAC, there is not enough data to assess the human health risks resulting from these sources and it is uncertain to what extent this route contributes to lead exposure of humans.

B. Emissions and use-specific considerations

Hunting

For gunshot, the Dossier Submitter estimated emissions on the basis of available data on use volumes and an estimate of the number of hunters affected, excluding the impacts of the restriction of lead gunshot in wetlands.

For bullets, the Dossier Submitter estimated emissions for small and large calibres on the basis of hunting bag statistics making assumptions on the calibre used per type of quarry and the number of shots spent per animal.

Although these estimates are uncertain, SEAC considers that the figures provided are sufficiently robust to indicate the order of magnitude of lead emissions from hunting (uncertainties in the assessment are listed in section 3.4.2).

Sports shooting with lead gunshot

The amounts of lead released as estimated by the Dossier Submitter and by FITASC (Annex XV report consultation, comment #3221) show a large difference. Even with the revisions and explanations from the Dossier Submitter, estimated releases still seem to carry uncertainties and a calculation of the amount of lead used in sports shooting with gunshot which is released into the environment proves to be unexpectedly complex. The amount of 24 500 tonnes/year that is used as a mid-range value by the Dossier Submitter is the average of the initial estimate by the Dossier Submitter of 35 000 tonnes/year, based on data from the lead CSR (with data from shooting ranges in Cyprus being extrapolated to the total EU) and data submitted by FITASC in the consultation (#3221) which reported a total of 14 000 tonnes of lead per year. The data in comment #3221 are based on an annual total of 450 million clay targets sold in the EU (including UK). Considering the ratio of spent cartridges to clay targets will be about 1.2:1, this results in about 520 million cartridges being used in Europe, which in turn will give the amount of lead indicated. Though the Dossier Submitter discusses these arguments, they assume the amounts reported by FITASC are an underestimate because production capacity of clay targets in the EU seems to be higher than reported by FITASC. Moreover, there are gunshot shooting disciplines that do not use clay targets.

However, SEAC notices that available data (Baer, 1995) show that in the United States between 1970 and the mid-nineties, yearly use of clay targets seems to have been on average 560 million, which seems to compare relatively well to the FITASC value for the EU. Moreover, data that can be deduced from REACH applications for authorisation on the EU market for clay targets, also point to a total for the EU of around 500 million targets. These data show that the average tonnage used by the Dossier Submitter means that about 900 million cartridges are used in the EU. If this is correct, there are some 300-400 million cartridges used in other disciplines than clay target shooting. This difference seems rather large and it is questionable if this can be fully explained by use of cartridges in other disciplines like "helice shooting". In this respect it should be noted that FITASC clarified that the number of cartridges being used per year in the EU as stated in comment #3221 in the Annex XV report consultation does include other sports shooting disciplines apart from clay target shooting.

SEAC learned that independent numbers on cartridges used are not easily available (for example from Eurostat's statistics on the production of manufactured goods and international trade in goods), so it has to conclude that the discrepancy between numbers cannot be completely resolved. In view of the available data, SEAC considers the average value of 24 500 tonnes used by the Dossier Submitter as the central estimate, can only be considered an upper limit. A more plausible central estimate may be considered to be somewhere in the range of 14 000-24 500 tonnes/year.

In discussion with the Dossier Submitter, SEAC learned that the number of cartridges that

can be estimated from the number of cartridges fired at typical shooting ranges (Table 2-46 in the Background Document, data used in Tables 2-47, 2-48, 2-49 and 2-50), which would indicate a yearly lead release that is even lower than the FITASC estimate, should not be considered reliable enough to be used for this estimate.

Sports shooting with bullets

In the revised analysis of the Dossier Submitter, RMMs that are already in place are taken into account. For the baseline, the Background Document estimates that over a period of 20 years, 8 400 tonnes of lead (range: 110-30 000 tonnes) would be released into the environment. SEAC notes the large tonnage range and considers especially the lower limit as not fully plausible. However, in view of the explanation on the estimates concerning the use of lead for bullet shooting given by the Dossier Submitter in Annex B.9.1.3.2 and in absence of further data, SEAC considers these values as best available estimates.

For the Dossier Submitter's preferred restriction option (RO2c) this release would be reduced by 5 801 tonnes (central estimate; range: 83-20 434 tonnes). To allow a better overview, an extract of Table 2-42 of the Background Document, which gives estimates for avoided releases of the various sub-options 2a-2d, is shown in Table 12 below.

Table 12: Avoided emissions for the different RO2 sub-options

Restriction option		Estimated number of ranges affected	Emission reduction (tonnes) per year after TP	Emission reduction (tonnes) over 20 years (i.e. in the 15 years after the TP)	Relative emission reduction compared to baseline	
					Over 20 years	Over 15 years after TP
RO2 **Ban on the use of lead bullets for sports shooting with a derogation at notified outdoor locations where no agricultural activities take place and the following measures are in place (see different RO2 options below):**						
RO2a	Trap chamber, or sand trap (with impermeable barrier) or sand/soil berm (without impermeable barrier), combined with roof or water management system	2 440	299	4 487 (71-15 682)	54 %	71 %
RO2b	Trap chamber, or sand trap (with impermeable barrier), combined with roof or water management system	7 200	348	5 226 (78-18 349)	62 %	83 %
RO2c	Trap chamber, or 'best practice' sand trap with impermeable barrier and roof or permanent cover and water management system	7 880	387	5 801 (83-20 434)	69 %	92 %
RO2d	Trap chamber for static disciplines; AND 'best practice' sand trap for dynamic disciplines	8 000	386	5 786 (83-20 374)	69 %	92 %

Fishing

In order to estimate the effect of the proposed restriction on the amount of lead emissions due to fishing, the Dossier Submitter begins by examining the amount of emissions that are being generated at present. In order to do this, the Dossier Submitter takes into account the number of fishers, the number of vessels equipped with sinkers and an estimate of the annual tonnage of lead lost in fishing tackle (based on a literature review).

To estimate the reduction in lead emissions that would result from the proposed restriction, the Dossier Submitter takes into account the proposed transition period for sinkers and lures ≤ 50 g (i.e. three years) as well as that for sinkers and lures > 50 g (i.e. five years) and finds that the current level of emissions from lead in fishing tackle would be reduced by 48 300 tonnes over the 20-year analytical period considered (51 % reduction compared to the baseline). The remaining releases would come from lost fishing nets, ropes and line containing enclosed lead. If only sinkers and lures ≤ 50 g were banned, avoided emissions would decrease to 28 050 tonnes.

SEAC agrees with the methodology applied by the Dossier Submitter and considers that the figures provided are sufficiently robust to indicate the order of magnitude of lead emissions from fishing.

3.3.2.3. Other impacts

Summary of proposal:

In the Background Document, the Dossier Submitter reports on information received in the Annex XV report consultation on the impact the proposed restriction may have on the frequency of hunting and the economic consequences thereof.

With regard to lead bullets, the Dossier Submitter notes that while non-civilian uses are not within the scope of the proposed restriction, the restriction may have unforeseen consequences on the supply for these uses, because the lead ammunition lines are shared between civilian and military use. This is considered relevant for defence uses where security of supply considerations mean that contingency planning must be in place in the event of a sudden increase in demand (e.g. a conflict situation). However, in the responses to comments from the Annex XV report consultation, the Dossier Submitter considers any impacts on non-civilian uses will be negligible, as the proposed restriction for sports shooting with bullets foresees a derogation conditional on the implementation of appropriate and effective RMMs.

For the fishing sector, the Dossier Submitter reports on the following other impacts to society:

- **Distributional impacts**:
    - Distributional impact in terms of generated tax revenue (with an average VAT rate of 20 %) estimated to be worth €136 million annually.
    - Distributional impact in terms of supply chain surplus gain (EU and non-EU) of €180 million per annum.
- **Impact on trade and competition**: The Dossier Submitter reports on the prevailing trends regarding trade and competition (in particular the erosion of EU production of lead fishing tackle and the concurrent growth of imports) and notes that the proposed restriction is not expected to affect trade and competition beyond what is expected to occur in the absence of a restriction. It is noted however that the proposed restriction could be an opportunity for EU manufacturers of fishing tackle as it will create a new market for non-lead fishing tackle in the EU while exports of non-lead fishing tackle might also grow in the future due to regulatory changes in non-EU countries.

- **Impact on innovation**: The Dossier Submitter considers that the proposed restriction could promote innovation within and competitiveness of European fishing tackle manufacturers as it will provide a push for the development or non-lead alternatives.

SEAC conclusion(s):

SEAC considers it possible that a short-term drop in hunting activities could result from the proposed restriction; however, there is no evidence indicating a long-term impact on hunting in the EU.

An upgrade of RMMs may need to be undertaken for both sports shooting with gunshot and with bullets, which will require high investments. The impacts of such activities cannot be judged solely by the total amount of investment for the European Union as a whole. Depending on the way this would be organized, different actors in this field would be impacted much more than others.

For sports shooting with bullets, the indirect effect of a reduced availability of civilian shooting ranges for practice of military reserve soldiers has been mentioned already and is discussed further as an uncertainty in section 3.4.2 below.

SEAC concludes that no major impact on the production of ammunition for military and other non-civilian uses are to be expected from the proposed restriction. Hence, defence capabilities will not be negatively affected.

SEAC agrees with the assessment carried out by the Dossier Submitter and considers that available information does not indicate major other impacts to be expected as a result of the proposed restriction.

Key elements underpinning the SEAC conclusion(s):

In the consultation on the Annex XV report, it was raised that the proposed restriction could force hunters to quit or reduce hunting activities with negative impacts for society as a consequence (#3467, 3333). As supporting information, a survey among hunters was provided indicating that about 25% of hunters would stop hunting if the use of lead ammunition was banned. SEAC considers that a short-term decrease of hunting activities in response to the proposed restriction is possible due to the efforts needed to change shooting practice and to train with non-lead ammunition as well as potential investments for new equipment some hunters will have to make. However, experience from past regulatory measures on lead ammunition does not provide evidence showing a long-term drop in hunting.

SEAC points out that the data presented by the Dossier Submitter indicate that the need to upgrade RMMs at shooting ranges may be very different from region to region, depending on existing regulations and standard of RMMs already in place. For example, existing rules in Germany seem to fulfil the required standard already to a large extent. Smaller shooting ranges as they exist in e.g. the Nordic countries would be much more affected. This means that the economic impacts of an upgrade will be distributed unevenly in the EU.

With regard to potential negative impacts on the production of lead ammunition for uses outside the scope of the proposed restriction (e.g. military uses), SEAC notes that manufacturers already supply both alternatives and military ammunition. In normal times (with a regular supply to the military, e.g. for training), supply to civilian uses is essential for a continued economic operation of such lines. The present restriction would allow for a continued operation of such lines, because also in the future lead-based ammunition would be used for sports shooting. Even though the ban on use of lead bullets in hunting may affect total demand and thus profits generated by the production lines also supplying uses outside the scope, it is unlikely that this would impact the profitability of these lines. As under the

conditions of the proposed restriction sports shooting with bullets (annual use volume: 42 000 tonnes) can continue, production is expected to be still economically viable. The decrease in demand from hunting with bullets (annual use volume: 134 tonnes) will only lead to a small – if any – loss in profits generated from these lines. Therefore, a surge in defence orders in times of crisis can be handled and supply to the military will not be affected.

It should be noted that this conclusion is implicitly based on the assumption that the implementation of the proposed restriction will not cause a significant decrease in the volume of lead used for bullets in sports shooting. This might happen if many shooting ranges would choose to close instead of upgrading their RMMs. In that case a significant part of sports shooters may be forced to give up their hobby and thereby the volume of lead ammunition used in sports shooting would be reduced.

3.3.2.4. Overall proportionality

Summary of proposal:

In its assessment of proportionality, the Dossier Submitter compares the **cost** estimates (summarised in section 3.3.2.1 above) with the identified **benefits** (summarised in section 3.3.2.2 above) for the different sectors and/or uses.

For hunting some benefits have been monetised, including the **avoided mortality of** more than one million **birds** annually from primary ingestion of lead gunshot, valued at €114 million (€1 billion over 20 years), and the **avoided exposure to lead for humans** (via diet), estimated at €70 million per year for IQ loss (€852 million over 20 years) and €7.5-75 million per year for CKD (€91-912 million over 20 years). In total these amount to €192-259 million per year or €2-2.8 billion over 20 years and compare to costs of around €1.1 billion over 20 years.

However, as quantified or monetised estimates for the identified benefits are largely missing, the Dossier Submitter bases its proportionality assessment mainly on **cost-effectiveness considerations**. Depending on the affected sector/use, these are for the Dossier Submitter's central estimates in a range between €1 and €525 per kg of avoided lead releases (see Table 3). For the restriction proposal as a whole, costs of around €19 per kg of avoided lead releases are indicated. Overall, the Dossier Submitter considers the proposed restriction to be more cost-effective (i.e. it costs less to reduce lead release by 1 kg) than previous REACH restrictions addressing similar concerns.

In addition, the Dossier Submitter complemented the cost-benefit and cost-effectiveness considerations with considerations about the affordability of the proposed restriction for hunters and fishers.

Based on the assessment of the overall risk reduction potential and the socio-economic impacts for each sector and use affected, the Dossier Submitter concludes that the proposed restriction is, overall, effective and proportionate.

RAC and SEAC conclusion(s):

Hunting

The use of lead in hunting is a major contributor to the risks to be addressed by the proposed restriction. Based on available information on these impacts, the cost-effectiveness analysis as well as cost-benefit considerations SEAC concludes that the proposed restriction can be considered to be proportionate.

Overall, SEAC considers that a conclusion on whether a derogation of the use of lead ammunition in antique muzzle loading guns in hunting (and sports shooting outside of

shooting ranges) would be justified or not is not possible due to lack of information on the socio-economic impacts involved. Further information to assess these impacts may be submitted during the consultation on the SEAC draft opinion.

Sports shooting

Based on the assessment of the cost and benefit data presented, SEAC concludes that the proposed restriction as it relates to sports shooting with gunshot can be considered proportionate in all its potential options (RO1, RO2, RO3 and RO4 – see descriptions above). Still, there are considerable differences between the restriction options, which may lead to preference for one or the other. In any case, from a comparison with the restriction on lead in PVC, it becomes clear that eliminating or reducing the role of lead in sports shooting with gunshot is a more cost-effective means of reducing the release of lead into the environment than reducing lead in PVC.

For sports shooting with bullets, it should be noted that the range of the cost-effectiveness ratio for the preferred option is relatively large, with the upper end of the range being comparatively high, which may cause this option to seem less attractive. However, it should be noted that this is driven by the low value of the lower limit of the amount of lead used (which SEAC considers less plausible), which distorts the picture. As far as the central value is concerned, the preferred option seems to be well in line with other restrictions on lead.

Fishing

Based on available information on the impacts of the proposed restriction, the cost-effectiveness analysis as well as cost-benefit considerations, SEAC concludes that the proposed restriction can be considered to be proportionate.

There are some uses for which a ban might be considered disproportionate and where requests for derogations based on socio-economic grounds were received in the consultation, e.g. sinkers and lures > 50 g or lead split shots. In order to conclude on the impacts of derogating these uses, SEAC will require further information and therefore will highlight this for the consultation on the SEAC draft opinion.

Key elements underpinning the RAC and SEAC conclusion(s):

A. General issues

The Dossier Submitter assessed proportionality of the proposal by considering different factors including costs and benefits, cost-effectiveness of emission reduction as well as affordability for hunters, shooters and fishers. Given the complexities and uncertainties of the assessment, SEAC considers this approach as appropriate to facilitate the evaluation of proportionality.

Given the very limited quantitative information on the benefits of the restriction, the cost-effectiveness analysis is a useful tool to indicate the relative cost per kg emission avoided for the different uses covered. In this respect, SEAC notes that in general the proposed restriction could be considered as a cost-effective measure to reduce lead emissions when compared to other risk management measures on lead that were adopted in the past. However, as only limited information on the socio-economic consequences of these emissions is available and no scientifically- or policy-based emission targets for lead are established that could serve as a benchmark, SEAC can only draw incomplete conclusions on proportionality on the basis of cost-effectiveness. As stated earlier, SEAC underlines that lead emissions covered by the proposal are likely to result in variable impacts depending on the use (e.g. shooting), in which form lead is released (e.g. size) and where emissions occur.

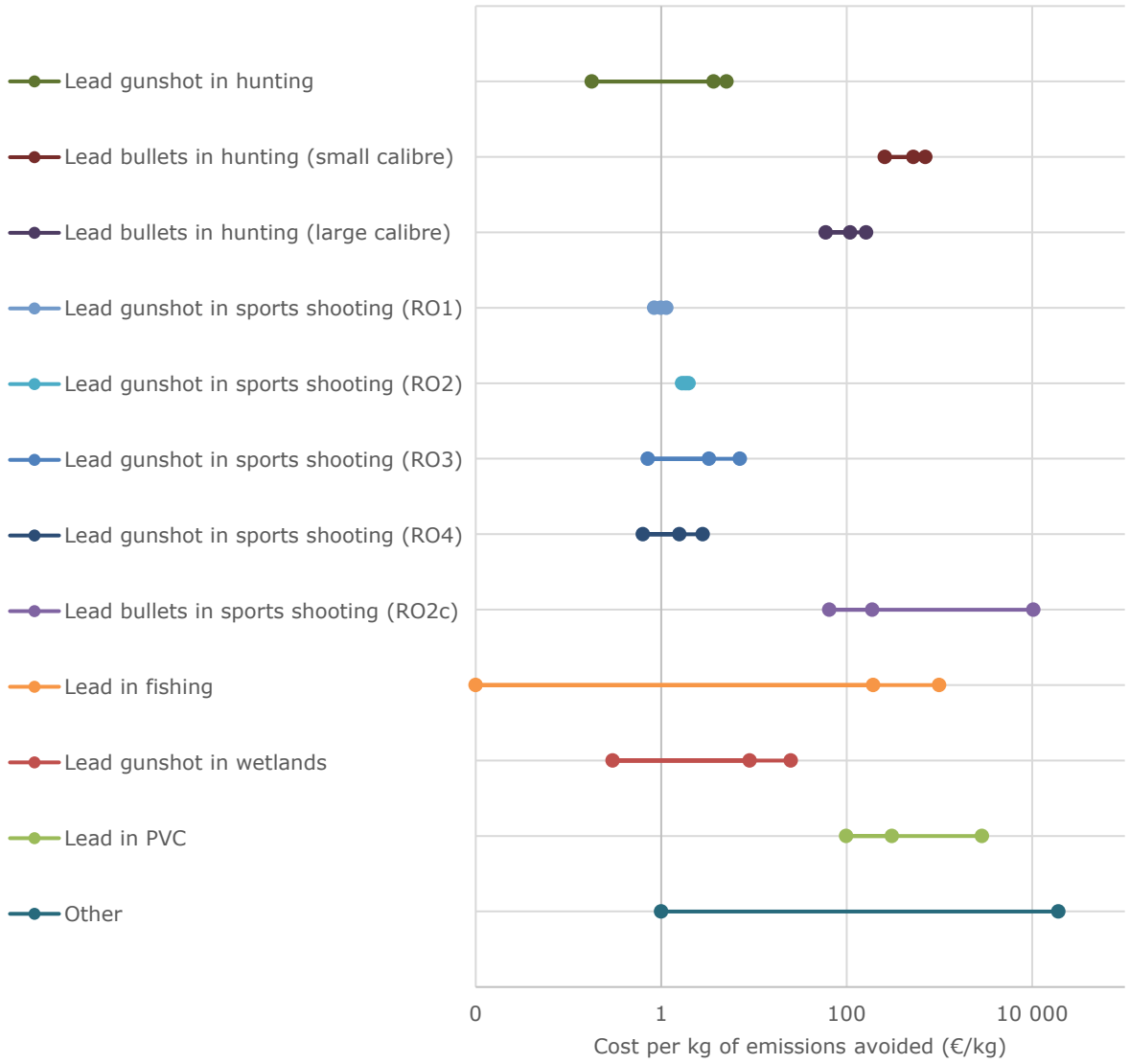
Even though generally accepted benchmarks on the cost-effectiveness ratios to judge

proportionality are not available, it is still useful to compare the cost-effectiveness ratios of this restriction with those of other restrictions, in particular those involving lead. So far we can only compare to the restriction of lead gunshot in wetlands (central estimate: €9/kg; range: €0.3-25/kg) and lead in PVC (central estimate: €308/kg; range: €99-2 884/kg). In the Background Document, data on six other restrictions (D4 and D5 in rinse-off cosmetics, DecaDBE, Phenylmercury compounds, PFOA, PFOA-related substances, and Hg in measuring devices) are available as well and show a range of €1-19 200/kg, but because they refer to different health and environmental impacts, direct comparisons have only limited value.

Following the representation of the Dossier Submitter, the ranges of cost-effectiveness ratios are shown in Figure 1 below.

Given the limitations of cost-effectiveness ratios, SEAC considers that a consideration of the affordability of the proposed restriction for the affected users, i.e. hunters, shooters and fishers, is very useful to complement the assessment and to get a better indication of the consequences of the proposed restriction.

Figure 1: Comparison of cost-effectiveness of this and previous restriction proposals



Note: 'Other' includes D4 and D5 in rinse-off cosmetics, DecaDBE, Phenylmercury compounds, PFOA, PFOA-related substances, and Hg in measuring devices.

The x-axis of this representation is logarithmic. This allows to plot all entries in one graph but tends to mask differences between the various entries.

B. Hunting

B1. Hunting with gunshot

The ingestion of lead gunshot can be considered as the main cause of lead poisoning in birds. The proposed total ban of lead gunshot will effectively reduce this source of risks to the environment, which can be expected to result in numerous benefits (as elaborated by SEAC in its opinion on the restriction of lead gunshot in wetlands). Also, terrestrial bird species are known to pick up lead pellets originating from shot substantiating that benefits can also be expected from the proposed restriction in addition to the impacts of the wetlands restriction. The quantitative estimate of the benefits indicates that they could be significant, also taking into account that they capture only part of the positive impacts for society. As alternative gunshot is already commonly used by hunters, which can be expected to further increase due to the wetlands restriction, SEAC considers that the costs are likely to be manageable. This

conclusion is supported by the assessment of affordability to hunters provided by the Dossier Submitter (see section 2.5.3.3.1 in the Background Document). Moreover, SEAC considers that the cost assessment conducted in the Background Document is rather conservative and that the lower end of the range of cost estimates provided seems more likely to reflect the costs of the proposed restriction.

Apart from these cost-benefit considerations, the cost-effectiveness analysis also supports the proposed restriction as a cost-effective measure to address the risks of lead gunshot for the environment and human health.

B2. Hunting with bullets

Compared to gunshot, the use of lead bullets affects different bird species, i.e. more predatory and scavenging birds, who pick up bullet fragments from the quarry. Bullet fragments also lead to the contamination of the game meat leading to lead exposure of humans. Also here, only part of the benefits of the proposed restriction could be monetised (IQ loss in children). However, SEAC considers that available evidence supports the conclusion that substantial benefits are to be expected from the proposed restriction.

For large calibres, the supply of alternatives is well developed and in some Member States these are already commonly used. This situation is quite different with regard to small calibre bullets, where alternatives are not as widely available yet. Moreover, for small calibres the switch to alternatives may require further investment by the hunter in terms of replacing the barrel or the whole gun. At the same time lead emissions from small calibres are lower compared to large calibres. This is reflected in the cost-effectiveness estimates indicating that the ban of small calibres is less cost-effective than the ban of large calibres. However, this would not be sufficient for SEAC to conclude that the ban of small calibre bullets would be disproportionate.

The additional costs to hunters' annual budget can be considered as negligible based on the Dossier Submitter's assessment of affordability.

B3. Derogation requests

SEAC evaluated the impacts of derogating certain uses of lead ammunition from the scope of the proposed restriction. With regard to **vintage and muzzle loading weapons**, it is reported in the Background Document (Annex D.1.1.3.2) that very limited data are available for this use. However, the use is considered to be very small, both in the number of guns that are concerned and the amount of lead released to the environment that originates from such guns. In a study submitted in the consultation (#3400) the use of lead ammunition for muzzle loading guns in the EU is currently estimated at 0.8 tonnes/year for hunting and 682 tonnes/year for use at a shooting range (which would still be possible, if the shooting range fulfils the conditions set by the proposed restriction). It is unclear to what extent shooting outside of designated shooting ranges, e.g. historical re-enactments, would be affected by the proposal. In view of the relatively low level of use of such guns, the related comparatively low release of lead to the environment and limited contribution to lead levels in game meat, SEAC considers that the impacts of a derogation for this use would be small. However, there is no information to assess the benefits related to the continued use of muzzle loaders outside of shooting ranges. Therefore, SEAC considers it ultimately depends on policy priorities whether a derogation would be proportionate or not (unless additional information on the impacts involved is submitted in the consultation on the SEAC draft opinion).

Similarly, the environmental and human health impacts of a derogation of other niche applications like ammunition used in **seal hunting and full metal jacket bullets** are likely to be minor. As the benefits of these niche applications are unclear, the conclusion on proportionality of these derogations have to be taken on the basis of policy priorities.

C. Sports shooting

C1. Sports shooting with lead gunshot

It should be realized that for sports shooting, the amount of lead released carries an uncertainty. This means that the cost-effectiveness ratio (cost/kg avoided lead) may be different from that in Table 3 above.

To illustrate what differences the use of different values and assumptions that have been mentioned throughout the Background Document may have for the total costs over 20 years and the cost-effectiveness ratio, SEAC performed some calculations of its own for the Dossier Submitter's preferred option (i.e. a total ban of lead gunshot in sports shooting). The following scenarios were distinguished:

1. No price difference between lead and steel gunshot and no replacement of guns

2. Steel gunshot 2% more expensive than lead gunshot, no gun replacement

3. No price difference between lead and steel gunshot, 10% replacement of guns (price €3 000/gun), following the calculation of the Dossier Submitter

4. Steel gunshot 2% more expensive, 10% replacement of guns (price €3 000/gun), following the calculation of the Dossier Submitter

Calculations of these different scenarios were performed for a yearly release of lead of 14 000 tonnes (FITASC figure), and the 35 000 tonnes (upper limit considered by the Dossier Submitter). This yields the following results with regard to lead reduction, costs, and cost-effectiveness ratios:

Table 13: Cost-effectiveness ratios for sports shooting with gunshot, and their dependence on different input parameters.

Scenario Nr	Lead release [tonnes/year]	Lead release avoided [tonnes/20 years]	Extra cost ammo [million €/year]	Cost guns [million €/year]	Total cost [million €/20 years, NPV, 4%]	C/E ratio [€/kg]
1	14 000	210 000	0	0	0	0
2	14 000	210 000	4.8	0	43.6	0.2
3	14 000	210 000	0	34.0	310.5	1.5
4	14 000	210 000	4.8	34.0	354.1	1.7
1	35 000	525 000	0	0	0	0
2	35 000	525 000	11.9	0	109.0	0.2
3	35 000	525 000	0	34.0	310.5	0.6
4	35 000	525 000	11.9	34.0	419.5	0.8

Results for 24 500 tonnes/year (the central estimate used by the Dossier submitter) would generally fall in between the range of results obtained from using 14 000 and 35 000 tonnes/year.

The above makes it clear that without further narrowing of the values for the input parameters, it can only be concluded that the cost-effectiveness ratio for a total ban of gunshot in sports shooting will be in a range between €0 and 1.7/kg. Despite the different input values, the range is not that different from the range as given by the Dossier Submitter, which shows that the total analysis is rather robust and the cost-effectiveness ratio will likely

remain in the low single digits.

C2. Sports shooting with bullets

The range of estimated lead released in the baseline scenario is rather large. Therefore, also the reduction that is expected to result from the implementation of the proposed restriction will have a rather large range. As discussed above, this will shift the upper limit of the cost-effectiveness ratio to a rather high value. In order to judge the attractiveness of RO2c it is also important to look at the affordability discussion below.

C3. Affordability

Because the impact of the proposed restriction for sports shooting will be mainly felt by a specific group of the public – i.e. the users of ammunition in sports shooting (and not by companies) – it may be appropriate to look at the costs for the individual shooter that are expected to result from the proposed restriction, because it may influence his/her decision to continue or abandon activity in this sports discipline.

For the total ban on the use of gunshot, the data as provided by the Dossier Submitter suggest that costs per active shooter will be between €4 and €12 per year. As indicated above, it may even be argued that costs are overestimated, so in reality costs per shooter may even be lower.

However, it should be taken into account that individual shooters that need to purchase a new gun may have one-time costs of up to a few thousand euros. On the other hand, such a new gun may last a long time, so that costs per year are not that high.

The picture is different for the restriction option with the optional conditional derogation, where multimillion euros of investments become necessary to upgrade a certain fraction of shooting ranges, mainly at the benefit of a limited group of top shooters.

If the costs of RO4 (mid value €548 million over 20 years) are supposed to be shared by all active sports shooters in the EU (2.5 million) this results in €219 per shooter per 20 years, which gives about €11/year. For an individual this seems quite affordable. However, the situation is different if individual ranges, or clubs operating them, decide to upgrade the available RMMs and have to pay for such costs solely by contributions of their own membership. This may cause significant cost increases for individual members, unless national sports shooting associations will assist in these upgrades. For example, a NPV for an investment over 20 years of €0.9 million, calculated by the Dossier Submitter in Table 2-49 of the Background Document for a shooting range of category D (some RMMs already in place, a site with three stands), to be paid for by a club with 100 members would mean a contribution of €9 000 per member over 20 years (= €450/year), which seems a very high burden for an individual member. For a normal member this burden looks even more unattractive if it is considered that these investments are only performed to accommodate a selected group of top shooters (i.e. if the costs would be calculated per top-level shooter, this would result in a significantly higher number).

For sports shooting with bullets, investments for an upgrade of a range will be much lower. From the data resulting from the calculations of the Dossier Submitter for the preferred option RO2c, as available in detail to the rapporteurs, upgrade costs per site (for those sites that need an upgrade) are found in the central scenario to be between €6 646 and €361 583 over 20 years (average for all sites that need an upgrade: €138 880)[30]. The financial impact for a

[30] The lower end of this range (€6 646 per site) relates to sites where a sand trap with an impermeable barrier and a roof/permanent cover is already in place and only a water management system needs to be implemented to comply

club with 100 members will now be between €3 and €180 per year (rounded values), with an average of about €70 per year per member. This still seems affordable.

In the above analysis it has to be realized that the costs per shooter will be considerably less for those clubs and ranges (and their members) where appropriate RMMs are already in place, even if only in part. In this respect it also should be taken into account that already now some Member States (e.g. Germany) have regulations in place that require similar RMMs as would be required by the proposed conditional derogation. This means that the regional impacts of the restriction may be felt differently in different countries.

D. Fishing

Cost-effectiveness

The proposed restriction is anticipated to reduce lead releases to the environment by about 48 300 tonnes over a 20-year analytical period while costs in the central scenario have been estimated at €9 300 million, resulting in a central cost-effectiveness estimate of €193 per kg of lead release avoided. The Dossier Submitter estimates a lower bound close to €0 per kg of lead release avoided in case cheaper alternatives are used, and an upper bound of €996 per kg of lead release avoided if all lead fishing tackle would be replaced by the most expensive alternative. SEAC notes that it is more cost-effective to avoid lead releases from fishing sinkers and lures > 50 g than in those ≤ 50 g (~€30 per kg compared to €311 per kg). However, in order to conclude on proportionality also other relevant information on the socio-economic impacts of the proposed restriction will have to be taken into account.

While the proposed restriction for lead in fishing tackle is estimated to be more cost-effective than previous REACH restrictions, it is less cost-effective than the restriction on lead in gunshot in wetlands, which ranged between €0.3/kg to €25/kg and was addressing the same types of environmental impact. Nevertheless, the Dossier Submitter concludes that the proposed restriction is a cost-effective measure for addressing lead releases to the environment from fishing activities.

Affordability

The Dossier Submitter concludes that the proposed restriction is affordable for fishers and retailers but states that it is currently not possible to conclude as to whether this will be the case for EU manufacturers. For the European manufacturers, affordability is, according to the Dossier Submitter, dependent on three main elements:

- proper enforcement of the proposed restriction option;
- the length of the transition period (sufficient time is required for suppliers to transition to non-lead alternatives and for a sufficient level of demand to be established);
- the financial capacity of the industry to invest in new moulds, and/or technologies.

Consultations with manufacturers suggest that global and local manufacturers could adapt if the alternative processes and/or materials have similar physical properties to lead, if they could use existing machinery and equipment, and if they are given sufficient time to adapt. Global manufacturers indicated to the Dossier Submitter that a sudden restriction would result in a loss in revenue and employment (both of which could run to 50%). Such a scenario would

with the RMMs required under restriction option RO2c. The upper end of this range (€361 583 per site) relates to sites where only a soil berm is currently in place and a sand trap with an impermeable barrier, a roof/permanent cover and a water management system need to be implemented to comply with the RMMs required under restriction option RO2c.

result in closure for most local manufacturers. The Dossier Submitter suggests that some financial support to help the European industry to transition to alternatives could be granted through, for example, the European Green Deal policy.

In terms of recreational fishers, the Dossier Submitter expects that the increased costs associated with the proposed restriction would be fully passed on to consumers and estimates that the purchase of non-lead fishing tackle would induce an additional expense of €30 per fisher per year, equivalent to €2 per day. This figure is derived from estimates of current fishing expenditure (taken from literature reviews and communications with fishing associations) as well as estimates of the prices of non-lead alternatives (taken from published price indices). The Dossier Submitter notes that alternative fishing tackle ≤ 50 g are in general more expensive than those > 50 g. As such, the additional expense per fisher and year does not change significantly if sinkers and lures > 50 g would be excluded from the ban. According to the Dossier Submitter, this increase represents 3% of the total expenditure of recreational fishers per year (when equipment, licences, trips etc. are taken into account) and, as such, is deemed affordable.

For commercial fishing, the Dossier Submitter considers that the proposed restriction will have no effect on the value of fish landed while fleet operating profits will not be significantly affected by the projected increase in the price of fishing tackle. Quantitative estimates are not provided by the Dossier Submitter.

With regard to retailers, as previously discussed, both physical and web retailers will have an obligation to comply with the restriction by ensuring that:

- customers are informed of the proposed restriction through information corners/posters etc. (until the transition period enters into force).

- lead is not present in the fishing tackle placed on the market

The Dossier Submitter assumes that these obligations will carry no cost for the retailers.

SEAC agrees with the Dossier Submitter that any increased costs that arise as a result of the proposed restriction option should be affordable for fishers and retailers. Evidence from the United Kingdom and Denmark, where similar restrictions are already in place, indicate that switching to alternative materials is possible for both the European fishing tackle industry and fishers.

In the case of commercial fishers, SEAC agrees with the Dossier Submitter that any price increase would not significantly affect net profits while for recreational fishers the price increase represents only a small proportion of the overall fishing budget and is, therefore, deemed affordable.

While SEAC disagrees with the Dossier Submitter that the cost to retailers will be zero, SEAC acknowledges that the costs associated with the obligation to provide signs and information in stores or on websites is likely to be a one-off expenditure and small relative to a retailer's annual costs.

The data that is available to SEAC indicates that affordability for EU manufacturers will depend on the cost of the alternative chosen and the moulds/technologies that are required for the production process. SEAC acknowledges that there is a risk involved for manufacturers when it is difficult to predict exactly what market will remain for non-lead fishing tackle as a result of the proposed restriction. However, SEAC notes the consultations that were held between the Dossier Submitter and manufacturers and, as a result, SEAC is of the view that the proposed restriction will only be affordable for manufacturers if the alternative processes and/or materials have similar physical properties to lead, if existing machinery and equipment can be used and if the transition period is sufficiently long. Assuming that these conditions

are met, the Dossier Submitter expects that manufacturers will continue in the market and any increased costs they face will be passed onto consumers.

3.3.2.5. Uncertainties in the proportionality section

Although the analysis of the proportionality based on cost-effectiveness ratios is common practice in SEAC, it should be realised that generally accepted benchmarks about what cost per kg emission abatement is considered to be proportionate are not (yet) available. This means that conclusions on cost-effectiveness drawn have a certain subjective aspect and are mainly based on a comparison with results of other restrictions. While this may be helpful to compare various proposed options of the current restriction, it is questionable if this is still the case if restrictions with completely different subjects are included.

3.3.3. Practicality, incl. enforceability

Justification for the opinion of RAC and SEAC

Summary of proposal:

Hunting

According to the Background Document, many examples exist of situations where hunters have already switched to lead-free ammunition (gunshot or bullets) which demonstrates that a restriction on the use of gunshot and bullets is possible and implementable.

The Dossier Submitter states that the restriction on lead in gunshot over wetlands poses similar challenges to national enforcement authorities. With a partial restriction pertaining to wetlands only, lead gunshot will still be distributed throughout the EU and will remain available on the market. Field inspections by national authorities to enforce compliance with the restriction on the use of lead gunshot in wetlands are possible but are likely to require coordination across regulatory agencies in Member States (i.e. REACH enforcement, environmental protection, police, etc.) and would therefore be expensive and potentially inefficient. SEAC concluded in its opinion on the wetlands restriction proposal that a ban on lead in gunshot covering all terrains would be easier to enforce as it would not be necessary to establish if the use of lead gunshot was in a wetland (or would result in lead gunshot falling within a wetland). Furthermore, SEAC concluded in the same opinion that restricting the 'placing on the market' in addition to 'use' would facilitate enforcement. This conclusion was also reached by Forum in their advice on the enforceability of the restriction proposal on lead in gunshot over wetlands.

The Dossier Submitter expects that the enforcement of a ban on lead-containing bullets may be more difficult in practice. However the packaging of ammunition carried by hunters should give some indication as to what material the projectiles are made of and the packaging of lead-containing projectiles that legitimately remain on the market (for sports shooting) are obliged to be labelled as containing lead. On the level of an individual bullet, the differences between lead bullets and copper bullets can be readily seen, except when fully jacketed lead bullets are used.

The Dossier Submitter also points out that bullets are marked with the calibre on the back of the cartridge which will allow enforcers to verify whether hunters comply with the regulation regarding the different transition periods for the entry into force of the restriction for small and large calibres. Additionally, enforcers may use lead swipe tests in the field to detect any lead on a projectile or seize the cartridge or bullet for further analysis at the laboratory.

The Dossier Submitter states that compliance with the proposed information and labelling requirements can be ensured through enforcement at the point of sale and that the labelling of individual lead gunshot cartridges ('do not use for hunting') is intended to facilitate

enforcement in the field in case the optional conditional derogation for lead gunshot in sports shooting is implemented.

Sports shooting

For gunshot, implementability is currently considered limited by the Dossier Submitter for its preferred option (complete ban) because it would not allow athletes to train or participate at international competitions (e.g. Olympic Games, ISSF or FITASC events). The other assessed restriction options for sports shooting with gunshot are considered to be more favourable in terms of implementability, with 'licensing/permitting/derogation systems' for athletes already in place in Member States with an existing ban on lead gunshot. For bullets, the conditions of the restriction are deemed to be implementable, as demonstrated by the existing examples in Germany, Norway and Sweden.

According to the Dossier Submitter, its preferred option for sports shooting with gunshot (complete ban) is enforceable. The addition of 'placing on the market' is considered to facilitate enforcement as inspections can be done at the point of sale. The other assessed restriction options for gunshot are also considered enforceable because permitting of sites and/or licensing of individuals would be delegated to Member States to fit with their legal system. The Dossier Submitter notes that enforcement of permitted sites can be achieved by means of inspection of the required documentation and that selling/reselling of lead gunshot by retailers only to licensed individuals would be enforceable because retailers need to be licensed to sell ammunition and athletes would need a licence to buy lead gunshot.

For projectiles other than gunshot, the proposed ban on use with a conditional derogation is considered enforceable because the use would be performed at outdoor locations for sports shooting notified to national or local authorities depending on the Member State's legal system and compliance with the required RMMs can be enforced by means of site visits and inspection of the mandatory documentation.

The Dossier Submitter states that compliance with the proposed information and labelling requirements can be ensured through enforcement at the point of sale.

Fishing

The proposed restriction is considered implementable and manageable by the Dossier Submitter. Alternative techniques or equipment are available and economically feasible. Although none of the available alternatives meet the technical performance requirements for every type of fishing tackle, applications or fishing techniques, each alternative could successfully be used for one or more types of sinkers or lures.

The Dossier Submitter finds that the transition to suitable alternatives could be feasible if a sufficiently long transition period is given to the European industry to adapt their manufacturing equipment and production capacity.

According to the Background Document, the enforcement of the ban on placing on the market could be done through inspections at manufacturer sites, retailers, customs or websites, either by paper inspection, laboratory testing or swipe tests.

Additionally, the enforcement of the obligation to inform consumers at the point of sale, could be done together with the retailer inspections. According to the Dossier Submitter, it can be easily visually verified that information on lead hazard and risk is available, and visible at the points of sale, in the shops, and on websites selling lead fishing tackle.

Finally, the enforcement of the ban on use (use of lead fishing tackle, and use of techniques or equipment to intentionally drop off sinkers) will have to be carried out at the sites of use, i.e. fishing spots. This is considered necessary by the Dossier Submitter to prevent the use,

exposure and releases of home-casted lead fishing tackle. According to the Dossier Submitter, REACH inspectors might not be the most appropriate inspectors to ensure compliance with the restriction provisions. Instead, enforcement at the sites of use could be performed by the existing relevant national enforcement authorities for fishing matters, i.e. either fishing associations or local authorities or ministries, depending on the EU country. These authorities are assumed to be knowledgeable and skilled to recognise lead fishing tackle and drop off techniques or equipment.

RAC and SEAC conclusion(s):

RAC and SEAC conclude that although in principle enforcement of the restriction as proposed is possible, present enforcement structures as they exist in the various Member States are not well suited for this task. If the final implementation of the proposed restriction would necessitate enforcement to inspect private persons or shooting ranges and not only conduct inspections of the sale of ammunition/fishing tackle, this will present problems because REACH inspectors are not used to/trained for this kind of inspection.

Successful enforcement may call for intensified additional cooperation and agreement between various government control agencies, especially in cases where such cooperation does not yet exist. Moreover, because in different Member States different control agencies may be involved, it might also be difficult to ensure meeting minimum standards throughout the Union. New cooperating structures (whatever their nature) might need to be developed and would certainly add to the complexity of organizing enforcement and will add significant costs, beyond the usual costs associated with enforcing REACH restrictions.

In addition, for an efficient enforcement, it is important that all definitions used have a clear an unambiguous description.

Information and/or labelling requirements for ammunition and fishing tackle containing lead equal to or greater than 0.3% is likely to cause confusion and may cause difficulties in enforcement since otherwise the lead limit used in this (and the 'wetlands') restriction is 1% w/w. Therefore, RAC and SEAC propose to apply a limit of 1% w/w also for the information and labelling requirements.

Key elements underpinning the RAC and SEAC conclusion(s):

In the course of the RAC and SEAC discussions various aspects have been mentioned that gave rise to the conclusions as shown above. These can be summarized as follows:

In principle, a **ban on placing on the market** as it is proposed for lead in gunshot and in fishing tackle will be much easier to enforce than a ban on use only as implemented for gunshot in the wetlands restriction. However, as the wetlands restriction will only enter into effect in early 2023 there are no experiences from enforcement yet, but it is likely that in many Member States the resources required to allow for effective enforcement will not be available.

Where duties are imposed on local ammunition shops or shooting ranges, enforcement can be combined with existing controls, which will in many Member States already take place regularly (though not necessarily in a REACH framework).

Contrary to this, where **use** is to be **ban**ned, enforcement is expected to be problematic where this will involve **checks on private persons** and not on economic entities as it is usual for REACH restrictions. In many, if not all, Member States such checks will involve sections of the civil service that are different from the usual REACH and OSH inspectorates. It is unclear if formal structures exist or can be created that allow the flow of information and expertise between these agencies. If possible at all, it may involve bureaucratic hurdles and significant extra costs. Moreover, **inspections** on private persons will have to be done **in the field**, if

hunting and fishing are concerned. Even if control agencies do exist, it is questionable if they will have sufficient human resources to fulfil these new REACH-based duties in addition to their existing ones.

Practical issues may arise if an inspector wants to certify if certain parts used in the field (gunshot cartridges, bullets, fishing gear) do meet the proposed concentration limits for lead. Qualitative detection of lead is possible by the use of e.g. "swipe tests", even by non-specialised personnel. Although the quantitative determination of lead is not overly complicated as such, handling ammunition that contains lead is not straightforward. Only specialised laboratories have permits and procedures in place to store and handle live ammunition. This may make such analysis time consuming and will add to the costs of enforcement.

Where a **recovery rate of > 90%** of lead is part of the condition, i.e. for the optional conditional derogation for sports shooting with gunshot, this will call for a detailed book-keeping system of the amount of lead spent in shooting and the amount of lead being recovered after cleaning. Especially keeping track of the first part will be a challenge for most shooting ranges where such a system did not exist before. Consequently, it will be difficult for inspectors to judge if they comply with the condition related to lead recovery.

During the development of the Background Document and the RAC and SEAC opinions, the exact **formulation and meaning of some definitions** has undergone some development. Examples are the description of appropriate bullet containment/traps (now mentioned in paragraph 4d as trap chambers and best practice sand traps) and how to discriminate between military use (which according to paragraph 8 would be out of scope) and training for such use by reserve soldiers at civilian shooting ranges (which now is considered as "civilian use"). Apart from these developments, RAC suggests improving the definition of fishing wire to facilitate enforcement.

With regard to the **optional derogation for sports shooting with gunshot**, the foreseen two-tiered system of **permits/licences** (for shooting ranges and individuals) presents complications that will be difficult to handle for inspectors and shooters alike:

a. Again, this may involve checks on private persons which is not part of the normal REACH activities.

b. The system as proposed leaves room for large differences between Member States regarding conditions for such permits/licences. Not only may this give rise to unequal training conditions for athletes across the various Member States, but also the government control agencies that need to be involved may be different, which may cause confusion regarding the permits/licences and what they cover, which would be an undesired effect of the proposed restriction.

c. A yearly reporting system for the number of permits/licences granted to shooting ranges/individuals and the amount of lead gunshot used would be a new activity for inspectors, made more complex if they belong to different agencies which also may be different across Member States.

d. If the use of licences for individual athletes is supposed to serve their ability to participate in international competitions, mutual recognition of these permits (with potentially varying conditions) between Member States would be required, in order to maintain the "level playing field" that is mentioned as one of the objectives of the restriction. As such, RAC and SEAC welcome that such mutual recognition is suggested in the Background Document, but it is not an integral part of the restriction text.

In all, the permit/licence system has a risk of creating a highly unharmonized situation for the sports shooting field.

More extensive discussion regarding details of many of the aspects mentioned above can be found in the Forum advice.

3.3.4. Monitorability

Justification for the opinion of RAC and SEAC

Summary of proposal:

Hunting

According to the Dossier Submitter, the same tools, methods and equipment that are now used to establish the risk of lead in game meat can be used to monitor any progress on the phasing out of lead.

Sports shooting

The Dossier Submitter considers the proposal to be monitorable. The provisions under the optional conditional derogation for gunshot (if implemented) and under the conditional derogation for projectiles other gunshot for permitting/notification of sites and recording compliance with the required RMMs (and reporting in the case of gunshot) are considered to enable both the inspection and the monitoring of the restriction.

Fishing

According to the Dossier Submitter, the proposed restriction on lead in fishing tackle could be monitored using the same methods as used to perform their market survey, i.e. contact fishing tackle manufacturers, importers, retailers, consult websites and social media pages. Mystery shopping campaigns on websites and in retailers' shops could also be conducted for the same purposes.

In addition, the Member States could take advantage of the existing provisions set in the SUP Directive (EU) 2019/904 which require monitoring of fishing tackle containing plastic placed on the market, as well as waste fishing tackle collected. Expanding these monitoring and data requirements to reporting data on lead presence in fishing tackle would be useful for the monitoring of the proposed restriction.

RAC and SEAC conclusion(s):

Hunting

RAC and SEAC agree with the Dossier Submitter that current activities to monitor the lead concentration in game meat is suitable to monitor the effectiveness of the proposed restriction. In addition, another method of monitoring compliance is to explore the prevalence of ingested or embedded shot in birds or mortality due to lead poisoning over time.

Sports shooting

RAC and SEAC consider the restriction monitorable. In case the optional conditional derogation for the use of gunshot would be implemented, effective monitoring will depend on the reliability of "bookkeeping of lead use" at permitted shooting ranges. This will require shared reporting standards, which are not yet in place. The restriction also requires monitoring of lead content in drainage water from projectile impact areas (including surface water run-off) to ensure the effectiveness of RMMs at shooting ranges.

Fishing

Monitoring compliance can be performed by assessing prevalence of ingested lead from fishing tackle in waterbirds over time. Monitorability of the phasing out of home-casting with lead seems to be difficult. Lead is available from a variety of secondary sources (sheet metal from roofing, sheathing from old underground and submarine cables, old balance weights from car rims, car batteries, etc). Thus, home-casting with lead is largely beyond the control of enforcement authorities.

Key elements underpinning the RAC and SEAC conclusion(s):

In the area of sports shooting, the reporting on use and recovery of lead shot (as required in the optional conditional derogation described in paragraph 4b and paragraph 6), presents an administrative challenge. This will be especially the case for those countries where such obligations do not yet exist. Common standards for reporting may be needed. Moreover, the issue is made more difficult if government departments that are not involved in REACH enforcement will be assigned responsibilities. After all, the availability, comparability and reliability of data regarding the use of lead will be decisive in effective monitoring of this restriction.

3.4. UNCERTAINTIES IN THE EVALUATION OF RAC AND SEAC

3.4.1. RAC

Summary of proposal:

See RAC opinion.

RAC conclusion(s):

See RAC opinion.

Key elements underpinning the RAC conclusion(s):

See RAC opinion.

3.4.2. SEAC

Summary of proposal:

The Background Document includes an overview of the key assumptions made and the main uncertainties identified by the Dossier Submitter separately for hunting, sports shooting, and fishing:

- For hunting, the described assumptions and uncertainties relate to the hunters' and Member States' reaction to the restriction on lead in gunshot in or around wetlands, the reaction to recent initiatives at Member State level, the need for gun replacement, human health risks (see opinion of RAC in section 3.4.1 above), the lack of sufficiently detailed hunting statistics for some Member States, the length of transition periods, and the price of steel gunshot.

- For sports shooting, the described uncertainties relate to the extent to which RMMs are already in place at shooting ranges, human health risks (see opinion of RAC in section 3.4.1 above), the number of shooting ranges in Europe, the amount of lead used, the amount of lead released from bullets, the length of transition periods, and the price of steel gunshot.

- For fishing, the three main uncertainties with regard to the impact assessment described by the Dossier Submitter relate to the EU manufacturers' and consumers' reaction to the proposed restriction, home-casting, and enforcement. Additionally, the Dossier Submitter reports on uncertainties related to the lack of data on recreational fishing, the lack of data on sales and use of lead fishing tackle in Europe, the quantity of lead fishing tackle lost to the environment, and regarding which alternatives will be adopted to replace lead as well as the retail prices of alternatives.

The impact of some of these assumptions and uncertainties on key outcomes of the socio-economic analysis (i.e. release reduction, costs, cost-effectiveness) has been explored in a simple sensitivity analysis.

SEAC conclusion(s):

Overall, the uncertainties related to costs, benefits and proportionality of the proposed restriction are unlikely to have a significant impact on the conclusions reached by SEAC.

Hunting

The main uncertainties recognised by SEAC are summarised in the key elements below.

Sports shooting with lead gunshot

SEAC notes the following uncertainties. To some extent these have already been mentioned in the respective sections that deal with these subjects:

- The number of guns that need to be replaced.
- The availability and price of steel shot in the short term in all regions.
- The amount of lead released to the environment due to sports shooting with gunshot.
- The consequences of a number of differences between steel shot and lead shot could not yet be resolved in a conclusive way.
- It remains unclear what regional differences for national sports shooting organisations would result if the optional conditional derogation would be implemented.
- The probability and consequences of an "unharmonized" permit and licensing structure as proposed in the concept of an "optional conditional derogation" remains unclear.
- It is unclear how big the barrier will be for "licensed athletes" that will be forced to switch between steel shot (at their local club range) and lead shot (at permitted ranges, when training for and participating in international competitions).

Sports shooting with bullets

This part of the restriction presents uncertainties that are different from the use of gunshot:

- When will alternatives (especially for small calibres) become available?
- It remains unclear to what extent implementation of the restriction would lead to a decrease in the number of civilian shooting ranges that would be available for local military training of reservists.

Fishing

Uncertainties related to the impact assessment for the fishing sector are discussed in the different sections of this opinion and summarised below in the key elements.

Key elements underpinning the SEAC conclusion(s):

Hunting

Due to a lack of data, the impact assessment had to be based on several assumptions. Most uncertainties resulting from that were addressed by considering sensitivity scenarios.

The main uncertainties of the impacts of the proposal identified by SEAC are discussed in the relevant sections of this opinion. These are summarised below:

Scope:

- Transition period for the ban on use of lead gunshot in hunting: Development of production capacities of alternative gunshot, in particular steel (see above, section 3.3 – B1 and section 3.3.2.1 – B).
- Availability of non-lead alternatives for small calibre (rimfire) bullets after the transition period of 5 years (see above, section 3.3 – B2).
- Effectiveness of the ban on use of lead bullets in terms of enforceability (see above, section 3.3 – B2 and section 3.3.3).

Costs:

- Gunshot: Number of hunters affected (see above, section 3.3.2.1 – B1).
- Gunshot: Proportion of alternatives used other than steel, i.e. bismuth and tungsten (see above, section 3.3.2.1 – B1).
- Volumes of lead ammunition used (see above, section 3.3.2.1 – B1, B2).
- Price of alternative ammunition (see above, section 3.3.2.1 – B1, B2).
- Share of hunters who have to replace their gun or to re-barrel their rifle in response to the proposed restriction (see above, section 3.3.2.1 – B1, B2).
- Compliance costs for airgun pellets (see above, section 3.3.2.1 – B2).
- Costs to enforce the ban of use of lead bullets (see above, section 3.3.2.1 – A).

Benefits:

- Significance of non-quantified benefits (see above, section 3.3.2.2).

Other impacts:

- Impact of the proposed restriction on hunting activities in the EU (see above, section 3.3.2.3).

Sports shooting with gunshot

- **The number of guns to be replaced**: As has been discussed by SEAC in the

corresponding section above, it is not unrealistic to assume that most sports shooters have rather modern guns, where a switch to steel shot does not present technical problems. The number of 10% replacements therefore seems a kind of extreme worst-case assumption, because the Dossier Submitter also states that it is likely that for sports shooting with gunshot no replacement will be necessary at all. Regular purchasing of a new gun to keep up with technological development should not be counted as a cost of the restriction, only those purchases that became necessary because the old gun cannot be used for the steel shot alternative and has to be purchased at a point in time earlier than was originally expected. This uncertainty is partly covered by updates made by the Dossiers Submitter in the Background Document, by considering different scenarios with 6, 10 and 14% replacement of guns. However, SEAC cannot agree to the approach by the Dossier Submitter in this calculation in which a lower replacement percentage of guns is assumed to imply a lower tonnage of lead being used.

- **Amount of lead shot used in sports shooting**: This issue was already addressed in Section 3.3.2.2 of this opinion. Although SEAC concludes that the Dossier Submitter has clearly explained how they came to the low and high estimates used, the credibility of the highest estimate remains limited. This means that a number of calculations that depend on the tonnage of lead used in sports shooting carry an inevitable uncertainty.

- **Availability and price of steel shot**: As has been described above, recent information seems to indicate that steel shot is similar in price than lead gunshot. So, even the calculations of the Dossier Submitter where a 1-3% price difference was assumed may be too pessimistic. In combination with the point above this would mean that the cost of changing to alternative steel shot may be lower than that indicated by the Dossier Submitter. From the Annex XV report consultation there are some indications that at present the availability of steel shot is not yet the same in all regions. Although this may be expected to be a transient problem, it is not known how long this situation would continue.

- **Differences between steel shot and lead shot** were identified by the Dossier Submitter. Further data regarding such differences were submitted in the Annex XV report consultation (#3221). However, the conclusions drawn by the Dossier Submitter and the relevant sports association differ widely. Although the basic physical parameters are clear, there seems to be a need for an effort of the sports shooting sector to combine the practical experience of countries where steel shot is already in common use and what the associations see as insurmountable problems. Trying to conclude on the basis of the available data, SEAC tends to agree with the statement of the Dossier Submitter that a resistance to change seems more of an organisational than a truly technical problem, but more input form practice seems desirable.

- **Switching between using steel shot and lead shot**: If the optional conditional derogation as analysed by the Dossier Submitter would come to bear, this would create a situation where "licensed athletes" would shoot with steel at their local clubs and would have to switch to lead when in training for international competitions. Although SEAC does not doubt that such a switch is possible, it remains unclear how quickly such changes back and forth could be made in the available time. This issue did not generate any specific comments in the Annex XV report consultation, which may indicate it is minor after all, or that the commenters have not realised this would be part of this scenario.

- **Upgrade of RMMs at shooting ranges on a regional basis**: The approach taken by the Dossier Submitter seems a pragmatic approach to better account for the (financial) capacity for upgrading shooting ranges at the regional level. However, it does not address the question how the impacts will be distributed across the EU. In the cited examples in Germany, often the national sports associations and/or federal

government were involved in financing such centres of excellence. It is unclear if this will also happen in other Member States. Moreover, it is highly uncertain how the sports shooting world will react to this regionalisation concept – i.e. if people will accept longer travel times to/from a training range or if they will simply give up shooting. This may have unforeseen consequences for the implementation of this variant of the restriction, especially in countries where only few of the shooting ranges can afford to upgrade. It also remains unclear which actors need to become involved at a national level to implement such changes.

- **Permit and licensing structure**: The Dossier Submitter implicitly seems to assume that issuing and checking new permits will fit into existing structures in the various Member States. However, the Forum advice mentions that the fact that different government agencies may be responsible for such permits and licences may create confusion at least. It is uncertain if additional costs, beyond the assumed normal enforcement costs, will result from this. Although the Dossier Submitter outlined what the conditions of a "licence for athletes" should look like, these are only suggestions. SEAC has some concern that this may give rise to a highly "unharmonized" situation across the EU.

Sports shooting with bullets

- **Alternatives**: Many comments from the Annex XV report consultation point to the fact that for the highest accuracy, gun and ammunition should be closely matched. It is not clear what perspectives are for medium term development (and availability) of modified ammunition and guns (especially for small calibres).

- **Military training**: The Background Document and the related calculations in connection with a conditional derogation do not give information on how many (if any) of the existing shooting ranges would need to close down, because the investment costs are too high and cannot be shouldered by the local shooting clubs. In countries that depend heavily on local training options for reservists of their armed forces, this may create a problem, because in the conditions of the restriction these local civilian shooting ranges are bound by the restriction as well. In an unfavourable situation, this may cause the need for such soldiers to travel considerable distances to find a range. Because of the differences on how countries organize their national defence, this may become an issue in some countries, but not in others. See, for example, comment #3324 from the Finnish ministry of defence. Creating additional shooting ranges or upgrading existing ones just for this purpose, would be an additional burden for the national defence budget.

Fishing

Due to a lack of data, the impact assessment had to be based on several assumptions. Most uncertainties resulting from that were addressed by considering sensitivity scenarios.

The main uncertainties of the impacts of the proposal identified by SEAC are discussed in the relevant sections of this opinion. These are summarised below:

Scope:

- Availability of suitable alternatives for certain applications of sinkers and lures, i.e. dust split shots and large sinkers > 50 g (see above, section 3.3. -D)

Costs:

- Impact on manufacturers of sinkers and lures in terms of investment costs (see above, section 3.3.2.1 – D and 3.3.2.4 - D)

Benefits:

- Impact of the proposed restriction on home casting activities (see above, section 3.3 - D)

REFERENCES

Baer, K.N., Hutton, D.G., Boeri, R.L., Ward, T.J. & Stahl R.G. 1995. Toxicity evaluation of trap and skeet shooting targets to aquatic test species. *Ecotoxicology 4, 385-392*

Grandjean, P. & Landrigan, P.J. 2014. Neurobehavioural effects of developmental toxicity. Lancet Neurol 2014; 13: 330–38

Hammond, D. 2011. Health warning messages on tobacco products: a review. *Tobacco Control 20(327-337)*

Hoek, J., Gendall, P., Louviere, J. 2011. Rationalisation as delusion: pictorial health warnings and tobacco industry arguments. *J. Consumer Marketing 28(2), 476-483*

IOC. 2020. New IOC Guide to Make Sustainability "Business as Usual" for the Olympic Movement. Available at: https://www.csrwire.com/press_releases/45766-new-ioc-guide-to-make-sustainability-business-as-usual-for-the-olympic-movement

Malfas, M., Theodoraki, E. & Houlihan B. 2004. Impacts of the Olympic Games as mega-events. *Proceedings of the Institution of Civil Engineers Municipal Engineer 157, 209 –220*

McBride, J. 2018. The Economics of Hosting the Olympic Games. Available at: https://www.cfr.org/backgrounder/economics-hosting-olympic-games

Pain, D.J., Dickie, I., Green, R.E. et al. 2019. Wildlife, human and environmental costs of using lead ammunition: An economic review and analysis. Ambio 48, 969–988 (2019). https://doi.org/10.1007/s13280-019-01157-2

Pain, D.J., Green, R.E., Taggart, M.A. et al. 2022. How contaminated with ammunition-derived lead is meat from European small game animals? Assessing and reducing risks to human health. Ambio 51, 1772-1785 (2022). https://doi.org/10.1007/s13280-022-01737-9

Williams, S.J., Dubovsky, D., Merritt, J., Martinez, P. 2012. Available at: https://thearc.org/wp-content/uploads/forchapters/Are-alcohol-warning-signs-and-labels-working-An-examination-of-approaches-and-outcomes.pdf

Woelbert, E., d'Hombres, B. 2018. Pictorial health warnings and wear-out effects: evidence from a web experiment in 10 European countries. *Tobacco Control 28(e1), e71-e76*