

# Committee for Socio-economic Analysis (SEAC)

## Opinion

on an Annex XV dossier proposing restrictions on

Lead in shot

ECHA/SEAC/[Opinion N° (same as opinion number)]

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Draft date: 15 March 2018

## 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):	<i>Lead</i>
EC No.:	<i>231-100-4</i>
CAS No.:	<i>7439-92-1</i>

This document presents the opinions adopted by RAC and 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 public consultation and other relevant information resulting from the opinion making process.

### PROCESS FOR ADOPTION OF THE OPINIONS

ECHA on behalf of the Commission 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: <http://echa.europa.eu/web/guest/restrictions-under-consideration> on 21 June 2017. Interested parties were invited to submit comments and contributions by 21 December 2017.

### ADOPTION OF THE OPINION

#### ADOPTION OF THE OPINION OF SEAC

Rapporteur, appointed by SEAC:	<i>Karen THIELE</i>
Co-rapporteur, appointed by SEAC:	<i>Maria NORING</i>

### 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 *15 March 2018*.

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/17005/term> on *21/03/2018*. Interested parties were invited to submit comments on the draft opinion by *21/05/2018*.

### 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]*].

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

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.]<sup>6</sup>

## OPINION OF SEAC

The restriction proposed by the Dossier Submitter is:

Substance Identity	Conditions of restriction
Lead and lead compounds	<ol style="list-style-type: none"> <li>1. Shall not be used in gunshot for shooting with a shot gun within a wetland or where spent gunshot would land within a wetland.</li> <li>2. Lead gunshot shall not be in the possession of persons in wetlands;</li> <li>3. For the purposes of paragraphs 1 and 2: <ul style="list-style-type: none"> <li>• “shot gun” means a smooth-bore gun,</li> <li>• “gunshot” means pellets used in quantity in a single charge or cartridge in a shotgun;</li> <li>• “lead gunshot” means any gunshot made of lead, or any alloy or compound of lead with lead comprising more than 1% of that alloy or compound;</li> <li>• “wetlands” are defined according to Article 1(1) of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).</li> </ul> </li> <li>4. Paragraphs 1 and 2 shall apply 36 months from entry into force of the restriction;</li> </ol> <p>Member States may, on grounds of human health protection and/or environmental protection, impose more stringent measures than those set out in paragraphs 1 and 2. Member States shall inform the Commission of such measures.</p>

## THE OPINION OF SEAC

SEAC has formulated its opinion on the proposed restriction based on an evaluation of the information related to socioeconomic 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 lead compounds* is an appropriate Union wide measure to address the identified risks, as concluded by RAC, taking into account the proportionality of its socioeconomic benefits to its socioeconomic costs. The conclusion requires 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:

Substance Identity	Conditions of restriction
Lead and lead compounds	<ol style="list-style-type: none"> <li>1. Shall not be used in gunshot for shooting with a shotgun within a wetland or where spent gunshot would land within a wetland.</li> <li>2. Lead gunshot shall not be in the possession of persons in wetlands.</li> <li>3. For the purposes of paragraphs 1 and 2: <ul style="list-style-type: none"> <li>• “shot gun” means a smooth-bore gun,</li> <li>• “gunshot” means pellets used in quantity in a single charge or cartridge in a shotgun;</li> <li>• “lead gunshot” means any gunshot made of lead, or any alloy or compound of lead with lead comprising more than 1% of that alloy or compound;</li> <li>• “wetlands” are defined according to Article 1(1) of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).</li> </ul> </li> <li>4. Paragraphs 1 and 2 shall apply 36 months from entry into force of the restriction;</li> </ol> <p>Member States may, on grounds of human health protection and/or environmental protection, impose more stringent measures than those set out in paragraphs 1 and 2. Member States shall inform the Commission of such measures.</p>

*Comments on the conditions proposed by SEAC:*

The REACH definition of ‘use’ explicitly includes ‘keeping’ (Article 3(24)). The Dossier Submitter considers that the term keeping is equivalent to ‘possession’. Following this rationale, a restriction on ‘use’, without further qualification, implies a restriction on any of the uses defined under REACH, including ‘possession’. The proposed restriction is intended to prohibit any use of lead gunshot within a wetland (including possession) and the shooting of lead gunshot into a wetland from outside of a wetland (‘use [...] where spent gunshot would land within a wetland’). Other uses, e.g. possession, outside of a wetland are not intended to be restricted on the basis that this would increase the scope of the restriction beyond wetlands; this understanding is supported by the fact that the socio-economic analysis was also made based on the above rationale.

SEAC perceives an ambiguity in the proposed restriction with regard to the interpretation of possession in condition 2. Since the proposed restriction aims at the impact of shooting, it is necessary to distinguish possession where the intention is to use lead gunshot in wetlands and where not, e.g. when transporting lead gunshot to another area thereby passing a wetland.

SEAC takes note that also RAC notes that the proposed wording of paragraphs 1 and 2 may introduce ambiguity as it could be interpreted that the restriction on ‘use’ outside of a wetland is wider than intended. Thus, the meaning of use and possession are not equivalent in the proposal. RAC considers that it is very important that the wording of the restriction should

unambiguously indicate what precise uses (e.g. shooting/possession) of lead shot are restricted and where (inside or outside of a wetland).

## JUSTIFICATION FOR THE OPINION OF SEAC

### JUSTIFICATION IF ACTION IS REQUIRED ON AN UNION WIDE BASIS

#### Justification for the opinion of SEAC

##### *Summary of the proposal:*

Shooting with lead gunshot in wetlands, or where spent (i.e. fired) lead gunshot would land within a wetland, results in various risks all over Europe. Spent lead gunshot is frequently ingested by waterbirds such as ducks, geese and swans that typically inhabit wetlands, leading to a range of acute or chronic toxicological effects (often termed as lead poisoning), including death. Shooting with lead gunshot in wetlands also poses a risk to predatory or scavenging species via secondary poisoning<sup>1</sup>. The consumption of waterbirds shot with lead gunshot, or of those which have elevated tissue concentrations of lead, may also pose a risk to human health. In addition, deposition of lead gunshot results in general environmental contamination by lead and may locally result in contamination of groundwater resources.

The proposal primarily aims to protect birds from the aforementioned risks of lead gunshot emitted to wetlands by shooting. The Dossier Submitter concludes that Union-wide action is needed to address the risks associated with the use of lead gunshot in EU wetlands. Managing the risks at the Member State level has resulted in diverse national regulations (ranging from a total ban to no regulation at all), including four Member States that have not implemented any controls on the use of lead gunshot in wetlands. Thus, risk management measures implemented in Member States are inconsistent in terms of their level of protection of waterbirds and the environment in general. Since the flyways of migratory birds typically cross several Member States, this restriction would ensure the effective implementation of the African-Eurasian Waterbird Agreement (AEWA), to which the EU is a contracting party. Currently, national measures are not sufficiently effective in the protection of migratory birds, and regulating the risk at Union level is more likely to ensure an appropriate level of protection throughout the EU.

Apart from the risks to birds, the Dossier Submitter also highlights other risks related to shooting with lead gunshot that will be reduced by the proposed restriction.

##### *Key elements underpinning the SEAC conclusions*

SEAC agrees that the risks posed by the emission of lead gunshot into wetlands are a Union-wide issue, because of the broad geographical distribution of wetlands inhabited by affected bird species all over Europe as well as the use of lead gunshot (shooting), which takes place across the EU. The migration of birds underlines the importance of protecting them from lead exposure in every Member State. More harmonised risk management of lead gunshot at EU level would ensure that a consistent level of protection is achieved across the EU. At the moment, the EU risk management is inconsistent and, in breach with the AEWA, four Member States have not implemented any controls on the use of lead gunshot in wetlands.

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<sup>1</sup> Secondary poisoning occurs by exposure to gunshot embedded in the tissues of birds that were killed but not retrieved or wounded but not killed as well as by exposure to lead from the gizzard of birds or from lead accumulated in their tissues from the dissolution of gunshot after ingestion.

## *SEAC conclusions*

SEAC concludes that further action at Union level is required to address the risks associated with lead gunshot in wetlands. Furthermore, SEAC concludes that the effective implementation of the AEWA requires a consistent minimum level of protection of waterbirds across the Union, which would be achieved by the proposed restriction.

## JUSTIFICATION WHETHER THE SUGGESTED RESTRICTION IS THE MOST APPROPRIATE EU WIDE MEASURE

### *Summary of proposal*

ECHA was requested by the European Commission to prepare an Annex XV restriction proposal for the use of lead gunshot in wetlands in order to harmonise regulation in the EU and to comply with the AEWA<sup>2</sup>. As a consequence of this request, the Dossier Submitter screened variants of a restriction under REACH and other possible risk management options (RMO) including non-restriction regulatory measures under REACH and other existing EU legislation as well as non-regulatory measures.

The Dossier Submitter rejected all of these options, because they were found not to be practicable, effective and/or proportionate to control the risks resulting from the emissions of lead in gunshot to wetlands.

The risks from the use of lead gunshot outside of wetlands, or from other uses of lead ammunition, were not within the mandate given to ECHA by the European Commission and thus they have not been assessed in detail.

The RMOs not related to REACH that have been considered include voluntary measures, labelling requirements, taxation, existing EU legislation (EU Birds Directive (2009/147/EC), EU Habitats Directive (92/43/EEC)), and international agreements (AEWA, the Bern Convention, and the Ramsar Convention).

Concerning other possible RMOs within REACH, authorisation has been assessed. The Dossier Submitter considers this option as not suitable, because it would be disproportionate, as all uses of massive lead would then require an authorisation before use.

With regard to variants of a restriction, the proposal has been compared to six other restriction options. These were (see Section E.1.2. of the Annex XV report):

1. Restriction on the placing on the market and use of lead gunshot;
2. Restriction on the use of lead gunshot for all hunting activities;
3. Restriction on the use of lead gunshot for all hunting of birds or hunting of waterfowl (e.g. ducks, geese and swans);
4. Restriction on the use of lead gunshot in Ramsar Sites and/or Special Protected Areas (SPAs) in the Natura 2000 network;
5. Phased approach to implementing a restriction on the use of lead gunshot in wetlands (firstly only Ramsar sites/SPAs covered, after a further implementation period all wetlands according to the Ramsar definition);
6. No additional restrictions on the use of lead gunshot (baseline).

In the background document (BD), the Dossier Submitter assessed options (1-6) against the main criteria for a restriction: effectiveness, practicality, and monitorability. Due to the

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<sup>2</sup> For details on the mandate from the European Commission to ECHA, please refer to [https://echa.europa.eu/documents/10162/13641/echa\\_annex\\_xv\\_restriction\\_proposals\\_en.pdf](https://echa.europa.eu/documents/10162/13641/echa_annex_xv_restriction_proposals_en.pdf)

mandate given by the Commission, which is explicitly limited to the use of lead gunshot in wetlands, the Dossier Submitter did not assess the impacts of options 1 to 3 in detail.

The Dossier Submitter still concludes that a total ban of lead gunshot (option 1) or a ban of lead gunshot for its use in hunting (option 2) could be more effective than the proposed restriction (see Table 5.1 in the BD). The two options could also be more practical as enforcement would most likely be easier. Apart from these factors, monitorability is expected to be similar.

Based on a comparison of the proposed restriction with the remaining options (4 to 6), which were within the mandate from the Commission, the Dossier Submitter considered the proposed restriction to be the most appropriate option in limiting the risks from emissions of lead gunshot to wetlands. Further, the Dossier Submitter considered Options 4 and 5 to be less effective in managing the risks and option 6 (baseline) to not at all address the need for Union-wide action to control the use of lead gunshot in wetlands.

### *Key elements underpinning the SEAC conclusions*

SEAC agrees with the conclusions of the Dossier Submitter on the comparison of different RMOs within the mandate of the Commission. When only considering the targeted mandate, options 4 and 5 are likely to be less effective than the proposed restriction and hence not as appropriate to address the identified risks.

SEAC notes that the scope of the RMO analysis carried out by the Dossier Submitter does not cover a detailed assessment of all relevant options due to the targeted mandate given by the Commission. Therefore, it cannot be excluded that some of the rejected restriction options, such as a total ban on the use of lead gunshot for all purposes (option 1), or only for hunting (options 2), could address the risks posed by the use of lead gunshot in a more effective way than a targeted restriction on wetlands. SEAC took also note of the fact that the Dossier Submitter considered a total ban on lead in gunshot could be more effective than the proposed restriction in limiting the identified risks.

In this respect, SEAC notes that the risks of the use of lead gunshot outside of wetlands, which would be important to consider in a more comprehensive approach to the risk management of the use of lead in gunshot and other types of ammunition (e.g. rifle bullets), have not been fully assessed in the current dossier. An assessment of a total ban would have illustrated the relative impacts on humans and the environment compared to a targeted restriction in wetlands.

In terms of enforceability, a total ban is likely to simplify the enforcement necessary for a targeted restriction in wetlands<sup>3</sup> and better fit into existing organisations of enforcement, because the responsibility for compliance would not fall upon individual shooters, but on the producers and retailers of lead gunshot. SEAC considers that such a simplified approach to enforcement would likely result in greater compliance than a targeted restriction on the use in wetlands only. SEAC also notes that enforcement costs are likely to be lower for a total ban compared to the proposed restriction because enforcement would be targeted on retailers (which are more stationary) rather than on hunters while hunting.

Figures from industry show that the market for lead free gunshot constitutes approximately 50 % of the total market for gunshot and most of the main manufacturers have separate production lines for alternative shots (E.3.1.1. in the Annex). Therefore, it can be reasonably

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<sup>3</sup> In most countries producers and retailers of ammunition need special permission and are often listed in registers. This would further facilitate the enforcement in case of a total ban.



assumed that the costs for industry to cope with a total ban would be limited because there would be no need for opening new production lines. Moreover, the Dossier Submitter highlights a study from the US, indicating that industry would abandon the use of lead gunshot if a sufficiently competitive shotshell was developed. This is further supported by figures indicating that waterfowl hunting loads are not the major segment of the shotshell market.

SEAC also notes that a ban on the use of lead gunshot for hunting (option 2) compared to a ban on all uses of lead gunshot (option 1) is assumed by the Dossier Submitter to be potentially more effective than the proposed restriction. This would, however, imply that lead gunshot remains available, since placing on the market and use for non-hunting shooting would be exempted. Hence, enforcement might be more difficult than in case of a total ban of lead gunshot, but still for hunters it would be easier to comply with the legislation compared to the current proposal, because they will not have to identify the area covered by the restriction. Further information on the costs for the different shooters affected and on the risk reduction achieved would be crucial in order to compare costs and benefits and to assess the appropriateness of these other options.

In the public consultation proposals were received suggesting that a ban on using lead gunshot for hunting specific bird species (Option 3) would have been more appropriate than the proposed measure. SEAC finds that an analysis of such a restriction option, as well as options 1 and 2, would have been beneficial for assessing the effectiveness of the proposed option. As neither of these different options have been analysed by the Dossier Submitter, SEAC does not have sufficient information to assess the socio-economic impacts of any of these options.

Based on arguments provided by the Dossier Submitter (summarised in Table 5.1 in Annex XV report), SEAC considers that other options could have greater effectiveness and/or practicality compared to the proposed targeted restriction on the use of lead shot in wetlands. However, additional information and analysis beyond the scope of the mandate provided by the Commission to the Dossier Submitter would be required to confirm this and to conclude on the proportionality of such measures.

### *SEAC conclusions*

Within the targeted scope of the assessment of risk management options, SEAC finds the arguments given by the Dossier Submitter to be valid and agrees with the conclusions made on the different options assessed.

However, in SEAC's view it is likely that there are more effective options to limit the risks posed by the use of lead gunshot to the environment and to human health than the proposed restriction on the use of lead gunshot in wetlands. A broader analysis of different RMOs would be needed to draw a well-informed conclusion on the most appropriate RMO. This was not possible within the confines of the mandate given to ECHA by the European Commission.

Overall, SEAC concludes that the proposed restriction is the most appropriate EU wide measure within the targeted scope of the mandate given to the Dossier Submitter.

## Scope including derogations

### *Summary of the proposal*

The aim of the proposed restriction is to address the risks posed by the use of lead gunshot in wetlands. Therefore, all shooting with lead gunshot that might result in lead gunshot

landing within a wetland would be prohibited by the proposed restriction. Gunshot has been defined as “pellets used in quantity in a single charge or cartridge in a shotgun”. The term “shotgun” has been specified as a smooth-bore gun. The Dossier Submitter also proposed a limit value of more than 1 % of lead per pellet in order to define “lead gunshot”.

In order to ensure that the risk of lead gunshot in wetlands will be effectively controlled, all wetlands need to be covered by the restriction. The Dossier Submitter proposes to define wetlands according to Article 1(1) of the Ramsar Convention, as follows:

*“areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres”.*

The Ramsar definition of wetlands is broader than other definitions of wetlands (e.g. the EU habitats directive), and includes peatland. In order to limit the risk in wetlands, the Dossier Submitter considers this definition of wetlands necessary to cover as many feeding and breeding grounds of migratory waterbirds as possible. The areas that are included in the restriction have to be clear in order to facilitate the enforcement of and compliance with the proposal. Although various buffer zones were assessed by the Dossier Submitter, a fixed buffer zone was not included in the restriction proposal. The Dossier Submitter considered the wording proposed in the entry, “where spent gunshot would land within a wetland” to be a flexible, dynamic, and ‘fit-for-purpose’ approach to address in a proportionate way the risks arising inside of a wetland from an original use of lead gunshot outside of a wetland. Whilst the Dossier Submitter acknowledges that this flexible approach relies on the experience, skill and local knowledge of those undertaking the shooting<sup>4</sup>, it is still considered as the most appropriate means of describing the geographical scope of the restriction, taking into account the risks to be addressed and the mandate from the Commission.

In addition to the use of lead gunshot, the restriction prohibits possession in wetlands in order to facilitate the enforcement of the proposal. Feedback from stakeholders during the preparation of the Annex XV report indicated that the enforceability of any restriction proposal, and hence its risk reduction potential, would be enhanced by including the prohibition of possession of lead shot within a wetland that is within the scope of the restriction. However, the Dossier Submitter acknowledges that any restriction on the possession of lead gunshot, i.e. carrying cartridges containing lead gunshot in wetlands, might have unintended impacts on shooters when transporting or carrying lead gunshot on routes through wetlands without the intent to use them, or when crossing wetlands to carry out shooting outside of a wetland. The Dossier Submitter considers that these impacts can be prevented by further specification of the term ‘possession’ (see BD 5.3.1).

The transition period of 36 months proposed by the Dossier Submitter is based on information received from discussions with stakeholders and is considered reasonable to provide sufficient time to EU producers to increase production capacities of alternative gunshot, in particular steel shot.

The Dossier Submitter concludes that complementary enforcement, awareness-raising and educational programmes will facilitate compliance, but indicates that these activities would be up to Member States to implement. Although several sample cases from Member States are described in the BD, the Dossier Submitter does not elaborate on how such measures could be implemented on an EU wide basis and what they would entail in terms of costs.

The proposal explicitly provides the possibility for Member States to introduce (or keep existing) more stringent measures outside of wetlands based on grounds of human health or environmental protection.

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<sup>4</sup> In terms of the likely distance that lead gunshot will travel once fired (‘fall-out’ distances of 300 metres are possible).

## *Key elements underpinning the SEAC conclusions*

### Risks to be addressed

During shooting, the major part of lead gunshot is spread into the environment where it may be picked up by waterbirds and contributes to the general environmental background level of lead. The intention of the proposal is to address the risks posed by the use of lead gunshot, primarily those associated with primary and secondary poisoning of birds. In this respect, the focus of the proposal on wetlands seems appropriate. An assessment submitted by the AEWA Secretariat in the Public Consultation confirmed that the majority of species vulnerable to lead poisoning (85 out of 100 AEWA-listed species) feed primarily in wetlands. However, some waterbirds also feed outside of wetlands meaning the proposed restriction does not completely address the risks to those waterbirds. The Dossier Submitter has not quantitatively assessed this remaining impact. SEAC considers this as a scope-related shortcoming in the evaluation of the appropriateness of the proposal, noting that waterbirds feeding in other areas than wetlands, such as agricultural land, will not be covered by the proposal.

Other relevant impacts such as reduced lead exposure of humans via the environment, and particularly via the consumption of waterfowl, were mentioned by the Dossier Submitter as additional benefits of the restriction on the basis of a qualitative assessment (in the absence of sufficient information for a quantitative assessment). SEAC does not have sufficient information to evaluate the impact on humans, but recognises that RAC considers these risks to be relevant.

### Definition of wetlands

In order for the restriction to be effective to protect waterbirds from the ingestion of lead gunshot, "wetlands" as defined by the proposal have to include as many of their feeding/breeding grounds as possible. At the same time, the definition has to be specific and clear enough to be implementable and enforceable. In this respect, SEAC notes that the use of the definition of the Ramsar Convention is appropriate, because it is broader than other definitions such as the EU Habitats Directive, and it has already been accepted at international level. However, the Ramsar definition provides only a description of the generic wetland habitat types, and does not define their precise borders.

SEAC notes that this generic definition of wetlands could cause difficulties in identifying certain types of wetlands in practice, e.g. peatlands, marshes and fen. This could therefore cause difficulties for those shooting to know whether they are compliant with the restriction or not, e.g. in areas with a large extent of peatland, which is used for agricultural or forestry purposes. Such difficulties are not expected to arise for other generic wetland types included in the Ramsar definition, such as lakes, rivers or other areas of open water, which are more easily identifiable. The Ramsar definition does not include the size of a wetland, which may also complicate the identification of a wetland, in particular in areas that are characterised by a large number of water bodies of varying size, e.g. in Scandinavian forests.

In order to assess the practicability of the definition, the Dossier Submitter used a GIS study to explore what areas covered by their wetland definition (based on their corresponding CORINE land cover classes) were also covered by existing Natura 2000<sup>5</sup> sites with cadastral borders (see Annex to Dossier, B.4.3.3.1.)<sup>6</sup>. The results show that about 70 % of wetlands according to the Ramsar definition (other than waterbodies) lie within Natura 2000 sites<sup>7</sup>. To SEAC this indicates that the area subject to the restriction is identifiable in the majority of

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<sup>5</sup> Based on publicly available data from the EEA

<sup>6</sup> The analysis was produced based on the information available to the DS for the purposes of assessing the extent of wetlands that would be covered by the restriction. However, if data are to be used in an official capacity, for example for enforcement or compliance, the relevant Member States would need to update them based on the current situation in their territory.

<sup>7</sup> Lakes and rivers were not included in the GIS analysis, because their borders can be easily identified.

cases<sup>8</sup>.

Nevertheless, for those shooting it can be problematic to judge in practice whether an area is a wetland or not, e.g. in landscapes with a large number of smaller puddles and/or more or less dry peatlands. Therefore, SEAC considers that the use of the Ramsar definition could limit the enforceability and compliance with the restriction in certain types of wetlands. Further guidance to assist enforcement and compliance would be advisable for some wetland types in order to facilitate a consistent and effective implementation of the restriction in the different Member States.

In this regard, SEAC notes that the Dossier Submitter has not proposed a fixed buffer zone around the wetland habitats covered by the proposed restriction. Accordingly, it is up to those shooting and the inspector to judge if the lead gunshot could land within the wetland when fired. However, several comments in the public consultation suggest the need to define a fixed buffer zone. In general, nature conservation organisations argue for a buffer zone of 300 m in order to prevent lead pellets from falling within a wetland, and hunters' organisation argue for not including a buffer zone. Their arguments are mainly focused on practical issues such as enforceability and the ambiguity that hunters might face when hunting. In some countries there are already fixed buffer zones reaching 30 m from the border of the wetland. SEAC understands that it might be difficult to judge where the actual border of the wetland is, and that it therefore can be reasonable to include a buffer zone to clarify what area would be within the scope of the restriction and to safeguard against lead pellets from falling into the wetland. A wider buffer zone of 300 m implies a long distance between the current position of the shooter and the wetland, and it may therefore be difficult for shooters and inspectors, to determine whether they are standing within the buffer zone or not. A shorter buffer zone, e.g. 30 metres, could hence be more practical. However, the Dossier Submitter has not assessed the impact of a fixed buffer zone arguing that this would extend the scope of the restrictions beyond wetlands and therefore SEAC cannot draw a conclusion on what impact a buffer zone, no matter the size, would have in terms of proportionality.

With regard to the habitats covered by the Ramsar definition, several comments were received during the public consultation, in particular from hunters' associations, stating that the inclusion of (dry) peatland in the scope of the restriction would be problematic and not justified. The main arguments are that it is difficult for a shooter to judge whether the land is peatland (i.e. wetland according to the Dossier Submitter's definition), and that in these areas lead gunshot is not imposing a risk to waterbirds. However, information provided by the Dossier Submitter and submitted during the Public Consultation by UNEP/AEWA (#1873) indicates that the use of lead gunshot spent in peatlands does impose a risk to waterbirds<sup>9</sup>, as well as to other bird species. This conclusion is confirmed by RAC. In terms of practicality, SEAC acknowledges that it can be difficult for hunters as well as for inspectors to identify peatland as wetland, in particular with regard to dry peatland. In terms of costs of the proposal, SEAC points out that the inclusion of peatlands has been reflected in the cost assessment provided by the Dossier Submitter (see the section on socio-economic impacts below).

### Possession

SEAC notes that the proposed restriction is intended to prohibit any use of lead gunshot within a wetland including possession. SEAC agrees that it is important to include 'possession' in the scope of the proposal in order to facilitate the enforceability of the restriction, otherwise it will

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<sup>8</sup> SEAC notes that some areas (e.g. pastures or forests on dry peatland) were not included in the GIS analysis by the Dossier Submitter, which means that the area of the Corine land cover classes added underestimates the geographical scope of the restriction (see BD B 4.3.3.1). This is relevant for the cost assessment of the proposal and further discussed in the following section.

<sup>9</sup> According to the AEWA Secretariat, seven of the species listed under AEWA, considered vulnerable to lead poisoning, use "dry" peatlands during the breeding season, which is a particularly sensitive phase in the annual cycle of these birds.

be very difficult to prove non-compliance in practice. As non-compliance has been a problem in similar restrictions on Member State level, it is important to provide tools for effective enforcement. Possession not related to shooting is not intended to be restricted. This understanding is supported by the fact that the socio-economic analysis was made based on the above rationale. SEAC perceives an ambiguity with regard to the interpretation of possession. Since the proposed restriction aims at the impact of shooting, it is necessary to distinguish possession where the intention is to use lead gunshot in wetlands and where not, e.g. when transporting lead gunshot to another area thereby passing a wetland. Hence, there may be a need to clarify the term 'possession' in order to better reflect the aim of the proposal.

### Transition period

The arguments on the transition period in the BD are based on experiences from the US and discussions with industry representatives from the EU. Comments received in the public consultation indicate that hunters and gun trade associations would like to see a longer transition time. Their arguments are mainly that 36 months are not sufficiently long for the market to adapt and for proofing companies to finish the reproofing of guns in time. However, experiences from Norway received during the PC (#1639) suggests that the market can adapt smoothly to changes in the legislation. Some environmental NGOs advocated for a shorter transition period of 18 months since several Member States already have (partial) bans on lead gunshot in place, and that it has been known for a long time that the EU is a party to the AEWA agreement. In SEAC's view, there is evidence, indicating that a shorter transition period could be feasible. Since some Member States already have a total or partial ban, there is lead-free gunshot available on the market (and thus in production). In addition, the infrastructure for reproofing is already in place and the speed of work of adapting shotguns, where that is necessary, would only be increased. In terms of increased costs for advanced replacement of guns, a shorter transition period would have a minor impact.

### Enforcement

Concerning the conditions of the restriction, SEAC considers that the fact that the set-up and the extent of complementary enforcement and awareness raising measures (this is discussed further in the cost section) is not elaborated on, makes the conclusions on the appropriateness of the scope of the proposal weaker. An elaboration on these aspects would decrease the uncertainty of the effectiveness of this proposal. Neither is there an analysis of what an additional labelling of cartridges would imply for the effectiveness and enforcement of the proposed restriction presented in the dossier. Thus, SEAC cannot assess any impact resulting from the labelling of cartridges.

### *SEAC conclusions*

SEAC agrees that the scope of the proposal is in principal appropriate to significantly mitigate the negative impact of lead gunshot on waterbirds as well as the related secondary effects on predatory and scavenging species as it will reduce their exposure to lead pellets within the boundaries of wetlands.

SEAC agrees with the inclusion of 'possession' and considers that the specification as developed by the Dossier Submitter in cooperation with RAC and SEAC during the opinion making will help to effectively enforce the scope of the restriction in a proportionate way.

SEAC considers that a shorter transition period than proposed by the Dossier Submitter could be reasonable. However, a shorter transition period could pose a challenge to Member States that currently have a narrow or no ban on the use of lead gunshot in wetlands to implement the restriction and to establish the structures for the enforcement of the proposal.

Some uncertainties remain, which may influence the effectiveness of the proposal. These concern the precise border of certain wetland habitats, the significance of the ingestion of lead shot by certain species of waterbirds that feed outside of wetlands, the human consumption of waterfowl containing lead, and accompanying measures in the implementation of the restriction (extent of enforcement and awareness raising measures for shooters using lead shot).

## Effectiveness in reducing the identified risks

### Socio-economic impact

Justification for the opinion of SEAC

#### Costs

*Summary of the proposal:*

#### Impacts on hunters

The main cost elements identified by the Dossier Submitter are one-off costs and operational costs to hunters. One-off costs refer to the testing, adaptation and/or replacement of the current stock of shotguns unsuitable to fire alternative steel shot. These can include modifications to ensure the operability, or the premature replacement of a shotgun. Operational costs would occur as a consequence of switching to more expensive gunshot. In some cases, there will be no change for hunters, whilst in others the impact will be substantial due to the implementation of an entirely new legislation. There will also be changes of varying kind between those two extreme scenarios.

The level of costs that hunters will have to bear depends on several factors. The available information to estimate these factors varies and is associated with different levels of uncertainty. To illustrate the range of potential costs of the restriction proposal and the uncertainties involved in the cost assessment, the Dossier Submitter developed three scenarios (best case, central case, and worst case) based on different sets of assumptions on the following elements:

- The total number of hunters impacted by the restriction proposal. The number of hunters affected is driven by the scope of the existing legislation and the area that will be defined as wetlands in each Member State. The Dossier Submitter estimated the number of hunters affected taking into account waterfowl and fowl hunter populations (derived from hunting bag data), the scope of existing legislation, and the share of peatlands (which would be defined as wetlands by the proposed restriction) in each Member State using different assumptions for each cost scenario.
- The replacement and testing of guns due to the proposed restriction. The Dossier Submitter estimated the proportion of hunters who would test and who would need to replace their shotgun in order to continue hunting. Furthermore, the assessment is based on different assumptions on the expected service-life of a shotgun (as the restriction can be considered to bring forward replacement costs rather than create them *per se*) as well as on the average purchase price of a shotgun.
- The (mix of) alternative gunshots hunters will use to replace lead gunshot. The Dossier Submitter estimated the proportion of steel and bismuth/tungsten ammunition used by hunters once they can no longer use lead gunshot and defined a range of the relative price of these alternatives compared to lead.

The outcomes of the different scenarios are presented in Table 1. The Dossier Submitter considers the central case to illustrate the most likely impacts from the proposal, whereas the worst-case scenario is evaluated as being very unlikely based on available evidence.

*Table 1. The three cost scenarios as presented by the Dossier Submitter.*

	Best-case scenario	Central-case scenario	Worst-case scenario
Number of waterfowl hunters affected	36 000	252 000	645 000
Number of fowl hunters affected	414 000	1 236 000	1 768 000
Number of shotguns to be replaced	0	141 000	603 000
One-off cost for premature replacement of shotguns	€0	€97m	€680m
Annual operational cost (i.e. annual incremental cost to be spent on shot)	€0m	€35.9m	€158.5m
Annualised one-off cost for testing	€0.4m	€1.5m	€2.4m
Annualised one-off cost for new guns	€0	€7.0m	€31.7m
Total annualised cost to hunters	€0.4m	€44.4m	€192.5m

### Shooting activities other than hunting

Shooting practiced at shooting ranges or other areas that are located in wetlands, will have to replace lead gunshot to comply with the restriction. There is no information on the number or location of shooting ranges or other areas in the different Member States available that would allow to estimate the economic impact of the proposal on other shooting than hunting, e.g. sport shooting. Hence, this cost has not been assessed by the Dossier Submitter.

### Alternative ammunition and forestry

As a consequence of the suggested restriction, shooters affected will need to switch to alternative ammunition. According to the Dossier Submitter, substitutes, primarily steel but also others such as bismuth or tungsten, are widely available and in use, both within the EU and internationally. All these alternatives are technically feasible and the Dossier Submitter has not identified any negative environmental or health impacts from their use. Steel shot, according to the Dossier Submitter the alternative most likely to be used, has shown to give comparable results once shooters have become used to it. The ballistics of steel gunshot are different from lead gunshot and thus the loads need to be adjusted. Moreover, shooters will also need to adapt to steel gunshot, e.g. in terms of shooting distance. Furthermore, for hunting larger waterfowl, high performance steel gunshot may have to be used, which requires the use of a shotgun that has been proofed accordingly (see below).

Alternative ammunition is expected to be readily available. Many European manufacturers of lead gunshot have production lines of steel gunshot and other lead-free alternatives. There are also non-EU manufacturers selling different types of lead-free ammunition on the European market. Some local retailers might currently not hold stocks of lead-free gunshot though, or have limited quantities.

Alternative ammunition is generally more expensive than lead. However, recent data on the market price of gunshot cartridges indicates that there may be no difference in price between lead and steel gunshot (E.3.1.4.). The economic impact on shooters due to different prices of the alternatives is difficult to reliably estimate for the future, because there are several factors

affecting the retail price of gunshot including raw material price, production processes, market demand for the ammunition, relative market demand for different cartridge gauges, and taxes, e.g. VAT, in different countries.

The main drivers for differences in production cost are considered by the Dossier Submitter to be the market price of the raw material and the gunshot processing. An internet search made by the Dossier Submitter shows that the price of bismuth gunshot is approximately ten times higher than that of lead gunshot, and lead is about 30 times more expensive than iron. The Dossier Submitter concludes that the prices for bismuth gunshot are less likely to fall to the levels of lead gunshot, and assumes that prices for steel gunshot are likely to become lower once production and market demand increase considering basic market theory.

The Dossier Submitter experienced common obstacles with forecasting all these factors and hence cannot foresee how future market prices will develop. It is concluded though that the current price difference between lead and steel gunshot is relatively small, whereas bismuth and tungsten are more expensive than lead gunshot and are likely to remain so.

The Dossier Submitter presents studies and Danish experiences showing that there are no increased risks of ricochets from using other materials than lead gunshot. Shooting in wetlands, in general, seems to be at low ricochet risk no matter what gunshot type is used because of the high angle above the water surface.

Plastic wads are used as a seal preventing gas from blowing through the gunshot rather than enabling propelling. They are used in all types of cartridges and for all kinds of materials. In steel gunshot this has an additional function in preventing contact between the hard shot (i.e. the pellets) and the gun barrel. The wad is shot through the barrel together with the shot. The wad is usually not picked up by the hunter, in comparison to empty shells, which usually are collected. Hunting thus causes dispersal of plastic waste no matter what type of gunshot material is used. The Dossier Submitter has evaluated whether the use of other materials than lead in gunshot will cause increased plastic littering. The conclusion made by the Dossier Submitter is that a change to steel gunshot will not have an impact on plastic littering.

In the Public Consultation there have been comments indicating that Finland has restricted the use of steel gunshot in some forests due to the risk of damage to machinery of the veneer industry (e.g. #1601, #1604, #1624). However, when in contact with the Finnish forest industry, the Dossier Submitter did not receive any evidence for negative impacts on the forestry and veneer industry. Moreover, the Dossier Submitter points out that in case where such a ban on steel gunshot was established, hunters could still use the softer bismuth or tungsten alternatives.

### Manufacturers of gunshot

The Dossier Submitter has identified nine European manufacturers of gunshot. All have production lines of lead-free shotgun cartridges, including a production line of steel gunshot with varied selections of gauges and loads. They all have branches in most European countries and can thus easily provide their products in any Member State. In addition to this, North American manufacturers export lead-free ammunition to Europe. The Dossier Submitter assumes that there might be costs upon (European) manufacturers of lead gunshot, as these will lose a part of their current profits. The Dossier Submitter assumes this loss to be compensated by an increase in the sales of steel cartridges. These costs and compensations are not quantified. Manufacturers producing cartridge components compatible only with lead gunshot will lose part of their business, and there might also be some negative impacts on assemblers of cartridges when they need to adapt their machinery. The Dossier Submitter concludes that since this restriction proposal does not include a total ban, the impact will be limited since information shows that the major part of the lead gunshot production is supplied to other shooting activities than hunting.



## Replacement and re-proofing of shotguns

In order to fire steel gunshot, shotguns have to fulfil certain safety standards, which are guaranteed by proofing the gun. There are different levels of proof depending on the capability of the gun. Standard or superior/magnum-proofed shotguns can fire standard steel and other alternative gunshot cartridges. To fire high performance steel cartridges, the gun is recommended (by the CIP<sup>10</sup>) to be subject to the "Steel Shot" proof, which is a more rigorous test of the gun's ability to handle the pressures and shot hardness of steel/steel-like gunshot cartridges. The majority of shotguns that are currently used can be expected to be standard-proofed as this standard was already introduced in the 1970s. Hunters wanting to be sure, have the choice of re-proofing their guns. Since many Member States do not keep a register of shotguns, or do not require any registration of the number of shotguns owned, the exact number of old guns that would need to be replaced is not known.

When switching to alternatives, shooters may have to adapt somewhat to new conditions. For steel, they will have to increase shot size, or decrease gauge, because of the lower density compared to lead. Also, it is preferable to practice at a shooting range in order to obtain a feeling for how the patterning changes. According to the Dossier Submitter, this is a natural part of a hunter's annual preparation before hunting season starts. Bismuth can be used as a drop in alternative and requires no adaptations, and tungsten is considered as favourable for good ballistics and performance.

## Enforcement costs

The proposed restriction is only likely to be sufficiently effective in reducing the risk to waterfowl and other birds when it is complemented and supported by effective Member State enforcement or educational programmes (as discussed in E.5.2 in the annex to the Background Document). It is stated that there are examples where extensive enforcement has been needed in order to achieve risk reduction. The costs of enforcement will depend on the specific conditions in the different Member States. The Dossier Submitter expects the costs for enforcement mostly to be small in comparison with the substitution costs, but acknowledges that they can be substantial in some Member States.

## *Key elements underpinning the SEAC conclusions*

### Impacts on hunters

The Dossier Submitter has used a number of different sources in order to identify relevant estimates for the costs associated with the proposed restriction. For some estimates, such as the proportion of total hunting in wetlands, and number of shotguns prematurely replaced, the Dossier Submitter has used several sources to get an interval illustrating the uncertainties. This is considered by SEAC as a preferred practice. In other cases, this seems to have not been practically achievable, because only one source has been available. For some estimates, assumptions, though transparent, were not substantiated by data due to lack of information, such as the number of waterfowl hunters facing one-off costs. In order to reflect these uncertainties, the Dossier Submitter presented three scenarios to give an interval of the costs of the proposed restriction. SEAC considers that available evidence suggests that some of the assumptions of the worst case scenario are not realistic. This in particular concerns the relative price of steel gunshot compared to lead gunshot, as well as the mix of alternative materials used instead of lead, which are the main driver of the costs to hunters. Therefore, the cost estimate derived from the worst case scenario is likely to significantly overestimate the substitution costs of lead gunshot.

The assumed number of shotguns that need to be replaced (141 000 in the central case scenario for the whole of EU) is based on communication with stakeholders during the

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<sup>10</sup> Commission Internationale Permanente Pour L'Preuve des Armes a Feu Portatives.

preparation of the proposal. Some information from the public consultation indicate that this number could be higher<sup>11</sup>. It should be noted, however, that these comments were received from Member States with already existing regulations on the use of lead gunshot, therefore the figures mentioned in footnote 13 should be taken with caution. No figures for other countries have been received during the public consultation. Therefore, it is difficult for SEAC to evaluate the reliability of the information received.

When it comes to the calculation of the replacement costs, the Dossier Submitter presented annualised costs. The timeframes used are 10, 20, and 50 years for the three scenarios. The standard discount rate of 4 % is used. The reason for the Dossier Submitter to annualise the replacement costs is to make them commensurable with the annual flow cost (i.e. the incremental cost of using alternative shot ammunition).

For the figures on the amount of shotguns that need re-proofing, the Dossier Submitter refers to the AMEC study. That study, however, does not assess the need for re-proofing. Rather, it makes a not well-grounded assumption of the share of shotguns that needs to be replaced.

The analysis of the impact on shooting performance from using alternative materials is thorough and contains substantial evidence to conclude that the impact can be regarded as minor.

The analysis of the cost of switching to alternative gunshot is based on internet search, contacts with industry and hunters, as well as experiences from Denmark, which regulated hunting in wetlands as early as in 1985 and totally phased out lead in gunshot in 1996. Comments received during the Public Consultation also confirm that there are lead-free alternatives on the market in the EU. Figures provided in the Public Consultation on the market price of steel gunshot as alternative ammunition indicates both higher and lower prices per cartridge compared to lead gunshot (#1587, #1589, #1604, #1640, #1642, #1653, #1737, #1801, #1881). Noting the distributions in the price per cartridge presented by the Dossier Submitter, SEAC considers that the available evidence suggests there is no substantial difference in the price of lead and steel gunshot.

The conclusion that the amount of plastic waste discarded in the environment by hunters will not increase due to increased use of steel gunshot is considered by SEAC as plausible. The plastic wad will have a similar function in steel gunshot cartridges and will be lost when shooting, as the collecting behaviour by hunters is unlikely to change as a result of a transition to steel gunshot. SEAC also notices that RAC does not object to the Dossier Submitter's conclusion that the use of the mentioned alternatives poses no negative impacts on the environment or human health.

#### Impacts on shooting activities other than hunting

The costs on sport shooters have not been estimated by the Dossier Submitter due to lack of information on the number of shooting ranges that are located in wetlands, and the corresponding number of sport shooters that would be affected by the restriction<sup>12</sup>.

Some Irish stakeholders identified concerns in the Public Consultation about the impact on shooting ranges located in Irish peatlands (the number of relevant ranges was not provided). SEAC considers that the proposed restriction may affect sport shooters. However, comments from the Public Consultation (e.g. #1581) suggest that the impact is marginal. In several Member States there is a national ban in place on the use of lead gunshot in shooting ranges, covering the entire territory, not only wetlands. SEAC has no means to assess the significance of these costs.

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<sup>11</sup> For example, in comment #1562 it has been estimated that 300 000 shotguns would have to be replaced in the UK only. Another comment (#1590), stated that there are up to half a million shotguns not standard proofed in Norway. How many of the latter that needs to be replaced is unknown though.

<sup>12</sup> This information was specifically requested by the Dossier Submitter in the public consultation run from 21 June till 21 December 2017.

### Impacts on manufacturers of gunshot

The information on the costs on manufacturers is scarce. Not much information has been received during the preparation of the dossier and neither during the public consultation. It is stated in the Background Document that there are about ten European manufacturers of gunshot. The public consultation gives indications that it might be around 70 companies, mostly SMEs. It is not clear though whether they are all manufacturers or also retailers, or having other functions in the supply chain. The impacts on these producers are only discussed in a qualitative manner in the Background Document. It seems that the sectors consist of several actors producing multiple or one part to a gunshot. This has not been clarified. SEAC can agree that there are likely to be impacts on manufacturers, but that it is unclear what the magnitude of these impacts would be. All identified producers have separate production lines for alternatives, the suggested restriction does only affect a fraction of all uses of lead gunshot, and several Member States already have total bans. Therefore, the Dossier Submitter concludes that a loss in profit due to decreased demand for lead gunshot will be evened out by an increase in demand for alternative gunshot, and that the production of lead gunshot will not cease because of the proposed restriction. SEAC agrees with this conclusion. The Dossier Submitter has illustrated this distributional impact by estimating the profit gain of ammunition as well as to shotgun manufacturers resulting from the additional spending by hunters.

The Dossier Submitter argues that raw material prices and costs for shot processing are the main driver of the production cost of gunshot cartridges. However, currently that does not translate into lower prices for steel shot. This is likely to be due to the different processes used to manufacture ballistic steel shot (which is a consequence of the different physical properties of the metals). The cartridge production process will be similar for all gunshot types. The dossier submitter did not consider the gunshot production process in detail, but it seems likely that processes for the production of ball bearings could be adapted to produce ballistic steel shot. As ball bearing production is highly automated; once adapted to the production of ballistic steel-shot, the price of steel gunshot could fall to reflect the price of the base metal.

### Enforcement costs and training

Enforcement costs have not been quantified in the dossier. The Dossier Submitter underlines the necessity of enforcement for an effective implementation of the proposal, and it is hinted in several places in the Background Document that the costs might be substantial. Contradictory to this, the Dossier Submitter basically assumes that all hunters would comply with the restriction. There is no analysis to what extent enforcement is needed in order for the proposed restriction to be effective. The effectiveness of a restriction is likely to depend on enforcement activities, as well as information and training activities, and is therefore likely to vary across Member states. The more intense the enforcement activities are the higher effectiveness can be expected within some interval. From the public consultation, it is known that e.g. in France 1 500 wardens are employed to, among other tasks, control hunters. If the proportion put on controlling hunters is known, this could be used to present an estimate on the magnitude of enforcement that might be needed to implement the restriction in those countries where no enforcement is in place at the moment. FORUM concluded that the confinement of the scope of the restriction to wetlands poses considerable problems for enforcement, e.g. by making it necessary to define the area that is within the scope of the restriction, which could indicate that enforcement costs may not be negligible. However, SEAC notes that the expenditure on enforcement activities will not only be driven by the need of enforcement but also by budgetary constraints.

According to the Dossier Submitter, awareness raising and training could have a positive impact on the results from the restriction proposal. SEAC notes that there is no further elaboration on how this training would be designed or what the costs would be (to different

actors). SEAC considers that there might be technical and affordable solutions helping hunters to identify their location (e.g. using GPS<sup>13</sup> systems), which could also facilitate enforcement, as well as lower the negative impacts of non-compliance on hunters.

#### Gun/ammunition retailers and forestry

The Dossier Submitter expects no negative impact on gun and ammunition retailers in the EU. SEAC has no reason to assume otherwise when it comes to ammunition retailers, since it seems reasonable that a loss in sales of lead gunshot would, be compensated, at least partly, by profits of lead-free alternatives. Gun retailers, on the other hand, can be expected to gain some positive revenue in the short term from the replacement of shotguns, as also stated in the background document. SEAC agrees that it is a likely outcome.

No evidence is presented to indicate any impact on the forestry and veneer industry due to damaged/unusable timber or machinery caused by steel shot. The public consultation did not provide sufficient information to conclude on this issue either. Therefore, SEAC assumes that overall the impact is likely to be minor. SEAC further considers that due to the focus of wetlands, where forestry is less likely to occur compared to non-wetland areas, as well as the availability of alternatives that are softer than steel shot (e.g. bismuth and tungsten), the impact on forestry and veneer industry is likely to be limited.

#### *SEAC conclusions*

SEAC concludes that the different cost scenarios presented by the Dossier Submitter cover the range of potential costs to hunters that can be expected from the proposed restriction.

Taking into account all available evidence as well as the different sets of assumptions underlying the different scenarios, SEAC concludes that the central case scenario can be considered as the most realistic to illustrate the order of magnitude of costs that are to be expected from the proposed restriction. The worst-case scenario is likely to significantly overestimate the costs of the proposal, in particular because many hunters from Member States with existing regulation are included, and a significant price difference between lead and steel gunshot is assumed, which is not supported by recent data on retail prices of gunshot.

SEAC notes that the Dossier Submitter has performed a thorough analysis in trying to find the most relevant figures. The calculations made are robust and follow standard practice when it comes to discounting. Due to lack of information, the Dossier Submitter has based the different cost scenarios on several assumptions, e.g. when it comes to number of hunters affected, the number of shotguns that would need to be tested, reproofed or replaced, as well as on the (mix of) alternatives to be used. SEAC understands that it is difficult to get accurate figures on these types of issues. Hunting in general is a private activity and hence is not well monitored. Some estimates lack justification though (see section on uncertainties in the proportionality assessment). Still, SEAC accepts the estimations made on the costs for hunters since they are considered as sound and conservative enough.

SEAC considers that the costs to hunters, as estimated by the Dossier Submitter, constitute private costs and that tax (VAT) needs to be deducted to derive societal costs of the proposed restriction (as the Dossier Submitter does in its proportionality assessment).

Impacts on hunters and industry seem to be reasonable for most, with several distributional

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<sup>13</sup> Global Positioning System.

effects, e.g. costs for hunters will lead to gains for producers and retailers of alternative gunshot as well as shotguns.

Enforcement costs have not been quantified by the Dossier Submitter. The enforcement costs are also linked to the effectiveness of the proposal as discussed above. It would have been preferred to have some figures on enforcement costs and its effectiveness, also in relation to other RMOs. SEAC notes that the level of enforcement will depend on the ambition and effectiveness in each Member State. Depending on the design of the enforcement and the conditions in the specific Member State, the costs could be substantial or minor. However, SEAC notes that in practice the extent of enforcement activities is usually driven by the constraints of fixed enforcement budgets. Therefore, Member States will have to find efficient ways to enforce the proposal. Overall, the magnitude of enforcement costs compared to the total costs of the proposal are unknown. In turn, this could negatively affect the effectiveness of the restriction (in terms of higher non-compliance).

SEAC considers that this lack of quantified estimates on the impact on industry and enforcement, as well as its impact on efficiency, weakens the cost assessment presented by the Dossier Submitter.

## Benefits

### *Summary of the proposal:*

The use of lead gunshot is a major source of lead released to the environment. The total use of lead gunshot in the EU amounts to more than 21 000 tonnes per year. Accordingly, the proposed restriction will reduce lead emissions to wetlands. The Dossier Submitter has estimated that about 1 500 to 7 800 tonnes of lead are currently released per year in and to wetlands by shooting with gunshot (during hunting). No estimates are available for shooting activities other than hunting.

The primary benefit from reducing emissions of lead shot is a reduction of lead exposure and consequential adverse effects in birds (especially waterbirds, birds of prey, and scavengers) and other wildlife that are dependent on wetland habitats. In particular, this concerns the effects of lead ingestion by waterbirds leading to increased mortality as well as to sub-lethal effects through lead poisoning. These effects not only lead to premature death of birds and potentially negative impacts on their population sizes, but also reduce animal welfare due to the inflicted suffering, pain and distress of birds that have ingested lead shot.

Only the impact of increased annual waterbird mortality has been quantified by the Dossier Submitter, whereas the other effects have been qualitatively described. In a low, central and high scenario, applying different mortality rates (3.1%, 6.1% and 8.7%), the annual number of birds dying from ingesting lead gunshot has been estimated based on the size of the wintering and the breeding population of 33 bird species in the EU-28. In these calculations, the bird populations in Member States with a total ban of lead gunshot have not been included. The estimates derived show that between 400 000 and 1 500 000 birds die each year from the ingestion of lead gunshot. This figure does not include birds affected by sub-lethal effects, whose number has been estimated to be three times higher (Andreotti et al., 2018).

The impact on waterbird mortality has partly been monetised based on an estimation by Andreotti et al. (2018) of the restocking costs for 700 000 birds lost from 16 species. In this study, the costs to replace the birds that die from lead shot ingestion have been estimated based on the economic value of captive-bred waterbirds and the number of individuals that would have to be released in order to compensate for the annual loss of wild waterbirds dying

as a result of ingesting lead gunshot. These costs can be interpreted as opportunity cost of not being able to shoot a bird because it had died from lead poisoning. The opportunity cost reflects the use value for hunters, derived from revealed preferences, who stock birds to increase their hunting success. As a result, at least €105 million would have to be spent to replace waterbirds that have died of lead poisoning. This figure does not capture all waterbird species that are vulnerable to lead poisoning (16 species with available information out of 33 species, for which there is evidence that they are affected by lead gunshot ingestion). According to AEWA, about 100 waterbird species in the EU are considered to be vulnerable to ingesting lead gunshot based on their way of feeding, out of which 85 species are found to feed primarily in wetlands (#1873). Furthermore, the monetised impact of waterbird mortality also does not account for any long-term impact on population sizes due to sub-lethal effects of lead gunshot ingestion.

The restriction will also reduce lethal and sub-lethal effects of lead on predatory and scavenging birds, which are exposed through eating birds, and which have ingested lead gunshot or have embedded lead gunshot in their tissue. The Dossier Submitter has not quantified these impacts.

Other non-quantified impacts of the proposed restriction include potential impacts on other wildlife than birds (exposed through the food chain) as well as on wetland ecosystems at large. Also, lead gunshot as a potential source of lead contamination of (drinking) water resources has not been assessed by the Dossier Submitter.

In terms of social welfare, the reduction of the adverse effects from the use of lead gunshot in wetlands, on waterbirds and the related effects on ecosystems, have multiple consequences, which are summarised below:

- increased (long-term) opportunities for hunting
- increased (long-term) opportunities for leisure activities, e.g. bird watching
- reduced amount of lead released in the environment and related contamination of water resources (avoided remediation costs)
- better protection of bird populations and wetlands in general (non-use value).

Apart from environmental benefits, the proposed restriction is likely to contribute to a reduction in exposure of humans to lead via the environment (through the consumption of game meat and other potential sources, e.g. groundwater used as drinking water). The impacts of this exposure on human health has been mentioned by the Dossier Submitter. Neurodevelopmental effects are the primary concern of lead exposure, although high-frequency consumers of game meat, which could potentially be large (evidence presented in the Background Document suggests tens of thousands of people in the UK), could also be at risk from other adverse effects (i.e. cardiovascular and nephrotoxic effects). The Dossier Submitter highlights concerns of lead exposure from consuming meat from game shot with lead gunshot (which are demonstrated by warnings on the consumption of game meat based on the possible contamination of lead issued by several authorities in the EU).

In summary, Table 2 provides an overview of the benefits resulting from the environmental and human health impact of the proposed restriction as identified by the Dossier Submitter, quantified and not quantified.

*Table 2. Overview of the benefits resulting from the environmental and human health impact of the proposed restriction*

Use value	
Avoided opportunity cost associated with the annual mortality of approximately 700 000 waterfowl from 16 wetland bird species known to ingest lead gunshot.	€105M

Avoided opportunity cost associated with the annual mortality of other waterbirds.	non-quantified
Avoided opportunity cost associated with the annual mortality of predators and scavengers.	non-quantified
Beneficial impacts on leisure activities, including bird watching.	non-quantified
Avoided human health impacts through consumption of contaminated game meat and/or potential consumption of contaminated (ground) water.	non-quantified
Avoided lead emissions and impacts of environmental contamination.	1 500 to 7 800 t, not monetised
Non-use values	
Protection of wildlife and ecosystems.	non-quantified
Protection of rare bird species.	non-quantified

As a distributional impact, the restriction would result in increased profits for importers and EU manufacturers of alternative gunshot, importers and EU shotgun manufacturers and retailers (for replacing old shotguns), as well as shotgun manufacturers and retailers as a consequences of testing, re-proofing and modifying shotguns (as discussed in the section on costs). Based on the assumption that on average 40 % of the retail price of gunshot, shotguns, as well as the testing of shotguns will be profits for the supply chains concerned, this benefit would be substantial (about €14 million applying the numbers from the central case cost scenario).

### *Key elements underpinning the SEAC conclusions*

SEAC notes that the estimation of annual waterbird mortality due to ingestion of lead shot and the resulting number of birds lost is related to uncertainties (as assessed by RAC), but overall can be considered a realistic estimate (as confirmed by RAC). In this respect, SEAC takes notice that RAC concurs with the Dossier Submitter's conclusion that the use of the alternatives assessed poses no negative impacts on the environment or human health.

SEAC considers that the quantified monetised benefits in terms of reduced annual waterbird mortality is clearly an underestimate of the benefits of the restriction, in particular because

- less than half (16 from 33 species) of all waterbird species, for which there is evidence of lead shot ingestion, are covered;
- in total up to 100 species of waterbird species could be affected based on their way of feeding;
- sub-lethal effects in waterbirds as well as potentially resulting effects on population sizes were not included.

SEAC points out that the non-monetised benefits on waterbirds are likely to be substantial<sup>14</sup>.

<sup>14</sup> In this respect, SEAC notes that Andreotti et al. (2018) estimated the contribution of one additional species (Common Coot), which was excluded from the value of €105 m, because of limited data on the cost of captive-bred individuals, to € 28 m in the EU. The calculation was based on the assumption that captive-bred coots have the same post-release mortality of ducks, geese and swans. In addition, in the public consultation, information was shared (comment 1840) on the stocking cost of other bird species, including *Recurvirostra avosetta*, *Oxyura leucocephala*, *Somateria mollissima*, *Aythya nyroca*, *Marmaronetta angustirostris*, *Anas querquedula*, *Tadorna tadorna*, *Branta canadensis*, *Cygnus Cygnus*, and *Cygnus olor*.

When assessing the total environmental benefits of the proposed restriction, SEAC highlights the multitude of impacts, for which it was not possible to derive a reliable quantitative estimate, which are potentially large:

- The restriction of lead gunshot in wetlands will lead to benefits due to a reduction of lethal and sub-lethal effects on predatory and scavenging birds (as well as other species exposed to lead through the food chain), which were not included in the quantitative assessment. According to RAC, it is very likely that the restriction will contribute to their protection as well.
- The impacts of lead emissions from the use of lead gunshot in wetlands and resulting environmental contamination (i.e. of soil, sediment and aquatic compartments).

From an economics perspective, the impact on waterbirds and other wildlife affects social welfare in different ways. Apart from leisure opportunities like hunting or bird-watching as well as the consumption of game meat, aspects not directly related to the use of waterbirds and wetlands in general, such as animal welfare, biodiversity and the protection of rare bird species and associated ecosystem services are also important to society. SEAC points out that the non-use values of wetlands have been found to be significant<sup>15</sup> and are therefore important to consider when assessing the benefits of the proposed restriction.

SEAC notes that there may be differences in the valuation of these non-use values between Member States, but these differences do not affect this overall conclusion.

In terms of the risks of the use of lead gunshot to human health, SEAC takes note that RAC confirmed that it is very likely that the use of gunshot contributes to human exposure to lead, in particular through the consumption of game meat. In the evaluation of other restriction proposals on lead, SEAC has found that the reduction of human exposure to lead can be considered as potentially beneficial to society, which would also be valid for restricting the use of lead in gunshot.

One additional issue that has not been assessed by the Dossier Submitter, and hence has not been evaluated by RAC, is the content of arsenic in lead shot. RAC estimates that up to 63 tonnes of arsenic may be potentially released to wetlands per year based on a 1.5% content of arsenic in lead. Even though the risks of arsenic emissions is not quantified within this restriction proposal, SEAC acknowledges the potentially decreased exposure to arsenic as a result of the restriction of lead gunshot.

#### *SEAC conclusions*

In general, SEAC supports the benefits assessment carried out by the Dossier Submitter.

There is clear evidence that the use of lead in gunshot contributes to waterbird mortality and impairment, which has several negative impacts in terms of social welfare. In addition, lead gunshot contributes significantly to the emissions of lead to the environment.

SEAC concludes that the estimate of the economic value of waterbird mortality is clearly an underestimate of the total benefits of the proposed restriction, which are very likely to be considerably higher taking into account the multitude of non-quantified benefits of the proposed restriction.

In this respect, SEAC underlines that it is very likely that the proposed restriction will contribute to a reduction of human exposure to lead, which potentially results in additional benefits to society.

Absence of negative environmental and human health impacts of the alternatives to lead

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<sup>15</sup> In a meta-analysis of 30 wetland contingent valuation studies Brouwer et al. (1999) found that the non-use value of wetlands is on average about half as high as the use value.



gunshot is acknowledged by SEAC.

## Other impacts

The Dossier Submitter has identified impacts on manufacturers as well as on the forest and veneer industries as relevant. These impacts are discussed in the section on costs.

## Overall proportionality

### *Summary of proposal*

The Dossier Submitter has based the evaluation of proportionality on several elements considering the cost-effectiveness, the costs and benefits, as well as the affordability of the proposed restriction.

### Cost-effectiveness

The proposed restriction is anticipated to reduce lead emissions to EU wetlands by about 1 500 to 7 800 tonnes per year, with a central estimate of 4 200 tonnes. Considering the aggregated annual costs imposed on hunters (estimates range from €0.4 to €192.5 million depending on the scenario with €44.4 million as a central estimate), these figures suggest that the total cost per ton of lead emission avoided is in the range of €0.3 to €25 per kg. The central scenario suggests a cost-effectiveness value of €18 per kg of lead dispersal avoided. These figures are far below the cost-effectiveness values estimated for other REACH restrictions on lead and other substances (e.g. PBT-substances).

*Table 3. Cost-effectiveness of the proposed restriction in terms of emission reduction*

	Best-case scenario	Central-case scenario	Worst-case scenario
Total annualised cost to hunters	€0.4m	€44.4m	€192.5m
Annual emission reduction from replacement	1 432 tonnes	4 740 tonnes	7 684 tonnes
Unit abatement cost (p.a.) € per kg lead emissions avoided	€0.3/kg	€9/kg	€25/kg

### Costs and benefits

The quantified and non-quantified cost and benefits are summarised in Table 4. In the assessment, the Dossier Submitter has also considered the surplus gain to manufacturers and retailers of shotguns and alternative gunshot as a distributional impact resulting from the restriction partially compensating for the cost accruing to hunters.

In the comparison of costs and benefits, the Dossier Submitter considers the cost estimates based on the central cost scenario being the most realistic. With regard to the benefits, the monetised value is seen as reflecting only a part of the total benefits due to the numerous non-quantified and non-monetised benefits of the restriction.

*Table 4. Summary of expected costs and benefits of the proposed restriction*

Costs of the proposed restriction				Benefits of the proposed restriction	
Annuitised one-off costs	best case	central case	worst case	Use value	
Replacement of guns	€ 0	€7.0 m	€ 31.7 m	Avoided opportunity cost associated with the annual mortality of approximately 700 000 waterfowl from 16 wetland bird species known to ingest lead shot.	€105m
Testing of guns	€ 0.4 m	€1.5m	€ 2.4 m	Avoided opportunity cost associated with the annual mortality of other waterbirds, predators and scavengers.	non-quantified
Annual operational costs				Beneficial impacts on leisure activities including bird watching	non-quantified
Switching to alternative cartridges	€ 0	€35.9 m	€ 158.5 m	Avoided human health impacts through consumption of contaminated game meat and/or potential consumption of contaminated (ground) water.	non-quantified
Total annual cost to hunters (private cost)	€ 0.4 m	€44.4 m	€ 192.5 m	Non-use values	
Distributional cost in terms of generated tax revenues assuming an average VAT rate of 20%	€ 0.32 m	€ 8.9 m	€ 38.5 m	Protection of wildlife and ecosystem services	non-quantified
Enforcement	Non-quantified			Protection of rare bird species	non-quantified
Total societal cost	€ 0.8 m	€ 35m	€ 154 m	Total societal benefit	>€105m
Distributional cost in terms of producer surplus gains (after VAT deduction)		Up to €14 m			

## Affordability

Many EU Member States have already implemented different national legislations to ban the use of lead gunshot, without having a large impact on the number of wetland hunters in the regulated areas/Member States. According to the Dossier Submitter, this indicates that switching to non-lead shot is, in principle, affordable to the individual hunter. Based on the cost estimates presented in the Background Document, it can be expected that the additional cost to an average hunter for purchasing non-lead gunshot ammunition will be in the range of € 0 (best case) to € 656 (worst case) per year. This corresponds to 0 to 2.2% of the average annual hunting budget of a European hunter.

On top of this annual cost, hunters that do not own a standard-proofed gun that can be used with steel gunshot would incur costs for testing and/or costs for the premature replacement of their gun. For the testing of shotguns the Dossier Submitter estimates a cost of €140 per

test. The cost estimates for the premature replacement of guns can be expressed in terms of the individual one-off cost to a hunter of bringing forward the purchase of a new gun as a result of the restriction proposal. The Dossier Submitter expects this cost to be in the range of roughly €650 (central case) to €1,130 (worst case) for the average hunter. This additional cost could pose an extra burden to hunters with a significantly lower hunting budget. On the other hand, frequent hunters are more likely to have replaced a shotgun not suitable for firing steel gunshot by a standard proofed shotgun, which is already capable of shooting steel gunshot. This is because they are likely to replace their shotguns more often than infrequent hunters due to the service life of a shotgun being affected by the number of shots fired. As a consequence, no further investment would have to be made by these hunters because of the proposed restriction. This makes the Dossier Submitter assume that subsistence hunters will be less affected than other hunters.

*Table 5. Costs to hunters resulting from the proposed restriction in total and in percentage of average hunter's budget*

	Best-case scenario	Central-case scenario	Worst-case scenario
Additional cost per hunter (p.a.)	€0	€25	€66
Average hunter's budget (p.a.)	€ 3 000	€ 3 000	€ 3 000
Fraction of average hunter's budget	--	0.8%	2.2%

#### *Key elements underpinning the SEAC conclusions*

SEAC notes that the use of lead in gunshot contributes substantially to lead emissions compared to other uses (e.g. lead in PVC). In other restriction proposals on lead, emissions are used as a proxy of risk given the non-threshold nature of the toxic effects of lead in humans. Taking into account the multitude of non-quantified impacts of the restriction including the effect on human exposure to lead through the consumption of game meat, SEAC considers the aspect of cost-effectiveness of reduction of lead emission resulting from the proposed restriction as important to consider in the assessment of proportionality. SEAC considers that the available information on the costs and the benefits provides further justification for the proportionality of the restriction. Taking into account all uncertainties, SEAC considers that generally it has been demonstrated that the benefits of the restriction to society will outweigh the costs. This conclusion is supported by the fact that the monetised part of the total benefits of the restriction does not cover:

- all positive impacts of the proposed restriction, in particular on waterbirds (other than those impacts covered by the monetary estimate), on scavenging and predatory birds (as well as other predators within the food chain) as well as on human exposure to lead.
- the non-use value of the prevented mortality of those waterbirds (16 species) included in the study by Andreotti et al. (2018).

There is evidence that indicates that these non-quantified benefits are likely to be substantial (see section on benefits). This is illustrated by the fact that Andreotti et al. (2018) estimated the impact on only one additional species (*Common Coot*), which was excluded from the value of €105 m because of limited data on the cost of captive-bred individuals, to € 28 million in the EU. Hence, SEAC considers the value of €105 million clearly as an underestimate of the total benefit of the restriction.

On the cost side, SEAC notes that the upper-bound societal cost estimate of €154 million

(worst case cost scenario) is within the same order of magnitude as the monetised estimate of the benefits of the restriction. Based on the considerations above and taking into account that the evidence provided by the Dossier Submitter and submitted in the public consultation, SEAC considers that this worst case cost estimate is an unlikely scenario, and hence is likely to overestimate the costs. On the other hand, relevant cost elements, e.g. enforcement costs have not been included, in the cost estimates given by the Dossier Submitter. In sum, SEAC however considers it unlikely that these cost elements will significantly change the range of costs given in the Background Document. Based on these considerations, SEAC considers proportionality to be demonstrated.

In addition, taking into account that the costs of the restriction are borne largely by a small group, namely the hunters, the affordability of the costs to hunters is an important aspect to take into account in the overall assessment of proportionality. Overall, SEAC concludes that the assessment by the Dossier Submitter indicates that the cost to hunters seem to be reasonable, in particular when compared to the average budget of a hunter. This conclusion has not been challenged in the public consultation. However, SEAC highlights that there could be differences in terms of affordability between hunters in different Member States. The Dossier Submitter has not elaborated on the price elasticity of the demand in different groups of hunters, nor the affordability related to differing income levels in different Member States. Neither is the assumption that the share of subsistence hunters would be smaller verified by the Dossier Submitter. Therefore, SEAC cannot evaluate the relevance of those issues.

One general uncertainty regarding the restriction proposal is its effectiveness. The Dossier Submitter assumes in its assessment that the restriction will effectively prevent the use of lead in gunshot in and over wetlands. SEAC considers that this essentially depends on the compliance and enforcement of the restriction in the different Member States. Effective enforcement may require extensive investment from Member States, which could constitute additional costs of the proposal. As SEAC has not sufficient information to assess these costs, no conclusion on their significance in terms of proportionality can be made.

SEAC in principle agrees that the proposed restriction is a cost-effective measure to reduce lead emissions to the environment, as indicated by the cost-effectiveness estimates given by the Dossier Submitter. On the other hand, the lack of comparable risk management options for this particular aim (reducing the risk to waterbirds and to wetlands), makes it difficult for SEAC to say whether this is the most cost-effective measure. Moreover, SEAC underlines that these estimates are not comparable to other REACH restrictions in terms of the expected human health and environmental impact of the emission reduction. In this respect, SEAC points out that the emission of lead as pellets may not be directly comparable to emissions of lead to air or dissolved in water.

## *SEAC conclusions*

Overall, SEAC concludes based on the evidence presented by the Dossier Submitter and the comments received during the Public Consultation, that the proposed restriction is a proportionate measure to control the risks of the use of lead gunshot in wetlands. In this conclusion, SEAC highlights the numerous non-quantified benefits, which are likely to be significant.

There are some uncertainties in this analysis, which are presented in the following chapter.

### Uncertainties in the proportionality section

The assessment of costs and benefits made by the Dossier Submitter is based on many parameters and assumptions. An overview of key parameters and assumptions and related uncertainties used can be found in Table A1 in the Annex. These are also discussed in the relevant sections above (costs, benefits, proportionality).

With regard to the cost assessment, variability related to the different relevant parameters (e.g. number of hunters affected, price difference between lead and alternative shot, mix of alternatives used, number of shotguns tested and/or replaced) are reflected in the different cost scenarios. There are some more general sources of uncertainty, which are not (fully) addressed by the cost assessment, i.e. the assumption of full compliance to current (baseline) and future (proposed restriction) legislation, enforcement costs as well as costs to other shooters than hunters. These issues and their significance for the costs of the proposed restriction are discussed in corresponding sections above.

With regard to the benefits assessment, SEAC considers the non-quantified benefits to be the major source of uncertainty compared to other sources.

To assess affordability, the Dossier Submitter assumes an 'average European hunter'. This average does not account for the large heterogeneity that exists between different European hunters in terms of their budget available for hunting.

## Practicality, incl. enforceability

### Justification for the opinion of RAC and SEAC

#### *Summary of the proposal:*

The Dossier Submitter considers the definition of what constitutes a wetland a key factor in determining the implementability and enforceability of the proposed restriction. This would require that wetland areas are clearly defined, based on the scope of the restriction, e.g. by producing detailed maps showing areas within which the restriction would apply. Furthermore, it could be beneficial to require mandatory training on the need and scope of the proposed restriction before hunting would be permitted, i.e. the training and examination needed to receive a hunting permit should be amended to that effect. The Dossier Submitter points out that these issues need to be addressed by Member States and acknowledges that the restriction will need to be complemented and supported by effective Member State enforcement in order to be effective. It is unclear what efforts would be required for effective enforcement, but it could be substantial.

Steel shot cartridges are produced by most European manufacturers (in this study sample all companies). It is by far the most common alternative to lead gunshot, particularly in the context of waterbird hunting. However, many European manufacturers produce other lead-free ammunition as well, e.g. bismuth and tungsten-based shot. In addition, North American

manufacturers distribute via their European representations, a variety of lead-free ammunition types in Europe. If a restriction on the use of lead shots in wetlands is introduced, manufacturers that produce lead gunshots might face a problem due to the fact that the technology used for manufacturing their product cannot be adapted to alternative metals. None of the products different from lead can be produced using the skills, technologies and facilities used to produce lead shots.

Concerns have been raised that steel gunshot might damage standing timber when lead was to be prohibited in the 1990s in Denmark, and the forestry authorities had recommended against the use of steel. However, the LAG report (2015) found no documented evidence of any problem with the use of steel ammunition in forestry in the Nordic countries (and Denmark in particular).

### *Key elements underpinning the RAC and SEAC conclusions*

The restriction proposal expresses concern for the manufacturers of cartridges. However, RAC notes that there are already restrictions since many years on the use of lead gunshot in wetlands in 23 out of 28 Member States, so the substitution of lead gunshot (and shotguns in some instances) should already be well underway in most Member States. It is unclear how much the proposal will broaden the need to substitute lead gunshot with steel (1,452-7,767 tonnes of lead/year is the estimate), and to what extent compliance will result in actual substitution. The producers may need some time to adjust, but there should be no practical problems.

As to forestry and the use of steel gunshot, comments have only been received from Finland, where it seems that logs containing steel shot are discarded by the forest industry. This is in contrast to the information from Denmark discussed above. Forestry is not relevant in most types of wetland, but may be relevant in (dry) peatland.

Many comments in the public consultation highlight the lack of enforcement in most Member States, and that a successful restriction requires that hunters accept the restriction and the reasons for it. The restriction proposal identified that education/training of hunters would be helpful, and comments in the public consultation support that theoretical training (e.g., with respect to wetland definition) would increase acceptance and practical shooting training with new non-lead gunshot would improve the hunter's success and decrease the risk for crippling prey. This training could, for instance, be part of licencing. RAC supports the need for awareness campaigns and educational programmes, and that hunters could benefit from training with new ammunition, e.g. steel shoot with clay pigeons.

Regarding enforceability, see above in the section of scope regarding enforcement aspects on buffer zones and possession of lead gunshot. In the view of RAC and SEAC, and supported by FORUM, obligatory labelling of cartridges containing lead gunshot is needed to help enforcement, as need for dismantling of cartridges and subsequent chemical analysis will be avoided. FORUM also notes that a restriction covering all uses of lead gunshot would rather enable enforcement to focus on the 'placing on the market' of lead gunshot in contrast to field inspections of hunters. In this respect, FORUM concluded that the confinement of the scope of the restriction to wetlands poses considerable problems for enforcement, e.g. by making it necessary to define the area that is within the scope of the restriction.

This view is acknowledged by SEAC, who also notes that enforcement costs associated with a total ban are likely to be lower than for the proposed restriction.

### *RAC and SEAC conclusions*

RAC and SEAC are of the view that the proposed restriction in principle is practical, as also

indicated by already having similar restrictions in many Member States. Alternative gunshot is already on the market, and sufficiently increased amounts for a larger scale substitution should be available within a few years. Awareness raising campaigns, training of hunters, and labelling of lead gunshot cartridges are additional factors that can increase the practicality. These factors have not been included in the cost assessment of the proposal.

## Monitorability

### Justification for the opinion of RAC and SEAC

#### *Summary of proposal:*

The most conclusive method of monitoring compliance with the restriction is to measure the prevalence of ingested or embedded gunshot in birds over time. Many of the current studies highlighting the problem of lead poisoning in waterfowl use this method, or varieties of it, to establish the scale of the problem. The method can readily be adapted to monitor the effectiveness of the proposed restriction.<sup>16</sup>

It could be beneficial to require mandatory training on the need and scope of the proposed restriction before hunting would be permitted in Member States, i.e. the training and examination needed to receive a hunting permit should be amended to that effect.

The costs of monitoring have not been assessed in the proposal.

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

##### *-RAC and SEAC conclusion(s):*

RAC supports that the most conclusive method of monitoring compliance with the restriction is to measure the prevalence of ingested or embedded shot in birds over time.

The costs involved with such a monitoring programme have not been assessed.

## UNCERTAINTIES IN THE EVALUATION OF SEAC

### *Summary of proposal*

Key assumptions and uncertainties of the analysis are summarised by the Dossier Submitter in Section 6 of the background document. These concern:

- The fraction of hunting that takes place on wetlands. The estimate is based on bagged waterfowl, but does not distinguish where the birds are shot.
- Hence, it is assumed that the share of waterfowl in the total hunting bag is the same in the different Member States. This simplification has implications for the cost estimates, and further, on compliance.
- The fraction of hunting taking place on peatland.
- The number of shotguns that needs to be replaced.
- The amount of lead emitted in or over wetlands could potentially be greater than assumed. In addition, emissions from shooting activities other than hunting are not

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<sup>16</sup> WWT (2010) describe a protocol for the determination of lead pellets in various species.

known.

- The use of mortality data for mallards for estimating the number of waterbirds dying might result in an over- or underestimation.
- The quantification of welfare impacts on the producers.

#### *Key elements underpinning the SEAC conclusions*

On top of the uncertainties mentioned by the Dossier Submitter, SEAC has identified some additional uncertainties:

- Other risks, such as man via environment, man via birds, and risk to the environment (including birds outside wetlands) are not included.
- The definition of wetland makes analysis and implementation more difficult since it does not describe the size of the wetland. Identifying dry peatland is a difficult task for both hunters and inspectors.
- How enforcement could be implemented and hence the cost is not assessed.
- Awareness raising (i.e. the adaptation of the hunter when shooting with an alternative ammunition) is not assessed in detail.
- Labelling of cartridges is not assessed which would have enabled an improved analysis of compliance and enforcement.
- Emissions from shooting activities other than hunting is not included in the analysis, a potentially significant impact on the environment.
- Experience of non-compliance from Member States with existing regulation and implications for the effectiveness of the proposal.
- Extent to which Member States would introduce more stringent measures.
- See also the Proportionality section for a deeper discussion on uncertainties.

#### *SEAC conclusions*

Benefits not quantified are likely to be significant if the proposed restriction is implemented. For other aspects of uncertainty, SEAC does not have enough data to judge whether they would increase or decrease the impacts.

One general uncertainty is the risk of non-compliance, which could compromise the effectiveness of the proposed restriction. The experience from existing regulation in Member States implies that non-compliance has been a problem in the implementation of partial bans of lead shot, i.e. in wetlands. As discussed in the section on proportionality, enforcement has the potential of increasing the costs but it is not known to what extent. On the other hand, improved enforcement can increase benefits as compliance would improve.



## ANNEX

*Table A1. Key parameters and assumptions in the assessment of costs and benefits*

Key parameters and assumptions
Cost assessment
Number of waterfowl and fowl hunters affected. Based on the existing legislation, bag data and GIS analysis.
Proportion of total hunting in wetland: Assessed on the basis of the number of waterfowl bagged vis-à-vis the total amount of birds bagged (hunting bag statistics) without distinguishing where the waterfowl and the other birds are bagged. Based on the assumption that (i) hunters that predominantly undertake one type of hunting over another and that (ii) the distribution of bag data across species is proportionate to the number of hunters in each of these cohorts. This could under- or overestimate the number of hunters affected.
Baseline: Effectiveness of current regulation in the different Member States. There is no comprehensive information on this issue available, however examples from some Member States indicate that compliance with partial bans could be low. This has partly been reflected in the worst-case scenario of the cost assessment, which includes more hunters than to be expected if compliance to existing national legislation was assumed.
Use of Corine land cover classes as a basis to estimate the significance of peatland in different Member States and to make assumptions on the number of hunters affected. Not all peatland according to the Ramsar definition is covered by the Corine land cover classes used, in particular peatlands used for forestry and agricultural purposes were not included (see BD B 4.3.3.1)
Number of cartridges consumed in EU-28. Based on one reference.
Retail prices of different kinds of gunshot. Based on web searches.
Assumptions on the percentages of steel, bismuth and tungsten are based on one references and assumptions.
The number of shotguns that will have to be prematurely replaced is based on data from literature, hunters' association, manufacturers, and personal communication. These figures can include bias.
Average purchase price of a new shotgun. Based on limited and old data, market changes could have occurred.
Percent of gun owners that will re-proof. Based on one reference.
Cost of proofing test per barrel. Based on one reference.
Costs to other shooters than hunters. Not sufficient information available to derive quantified estimates.
Costs for manufacturers. Not sufficient information available to derive quantified estimates
Enforcement costs and training. Enforcement costs have not been estimated by the Dossier Submitter. It is indicated that enforcement is of major importance for compliance. The costs for effective enforcement could be substantial
Gun retailers and forestry. Based on assumptions, a report, and no comments from public consultation.
The impact assessment assumes an 'average European hunter'. It should be recognised with regard to affordability that large heterogeneity exists between different European hunters in terms of annual bag, budget, etc.
Benefit assessment
Non-quantified benefits (related to the environment and human health, as described in Table 4) The number of waterbirds dying annually is based on average mortality data derived from a study of the population effects of lead shot ingestion in mallard (Bellrose 1959). The applicability of this method to other species of waterfowl and waterbirds is unknown and may have resulted in either an underestimation or overestimation of impacts.