



Secretariat provided by the
United Nations Environment Programme (UNEP)

Agenda item 12
Doc. StC 5.20
27 May 2008
Original: English

FIFTH MEETING OF THE STANDING COMMITTEE

24 – 25 June 2008, Bonn, Germany

Phasing out lead shot for hunting in wetlands

According to paragraph 4.1.4 of the AEWA Action Plan “Parties shall endeavour to phase out the use of lead shot for hunting in wetlands by the year 2000”.

When adopting Resolution 2.2 on phasing out lead shot for hunting in wetlands at the second session of the Meeting of the Parties in September 2002, Bonn, Germany, the Parties decided not to replace the expired deadline mentioned in the AEWA Action Plan by a new one, but to request Parties to report to each ordinary session of the Meeting of the Parties on progress made to phase out lead shot in accordance with self-imposed and published timetables.

In the past a series of international update reports on lead poisoning in waterbirds was produced by Wetlands International, the latest published in 2000. Their aim was to identify new developments in this field and to report on progress made. The continuation of the production of such update reviews on lead poisoning in waterbirds is one of the projects listed in the International Implementation Priorities 2006 - 2008 (priority number 11) as adopted by the Third Meeting of the Parties to AEWA, October 2005, Dakar, Senegal.

In 2007 the AEWA Secretariat implemented priority number 11 of the International Implementation Priorities 2006 – 2008 by reviewing developments since the year 2000 regarding the use of non-toxic shot for hunting in wetlands in the AEWA area. The final report, which was approved by the Technical Committee at its 8th session in March 2008, resulted in a number of recommendations due to the fact that insufficient progress had been made across the AEWA area.

Based on these recommendations the Technical Committee, moreover, approved a draft Resolution on phasing out lead shot for hunting in wetlands.

ACTIONS REQUESTED FROM THE STANDING COMMITTEE

The Standing Committee is requested to review the update report on the use of non-toxic shot for hunting in wetlands and the draft Resolution on phasing out lead shot for hunting in wetlands and to approve both for submission to MOP.



African-Eurasian Migratory Waterbird Agreement (AEWA)

*Secretariat provided by the
United Nations Environment Programme (UNEP)*

**Draft update report
on the use of non-toxic shot for hunting in wetlands**

2007

Prepared by
UNEP/AEWA Secretariat

This document has been prepared by the AEWA Secretariat:

Author: Catherine Lehmann, Programme Officer

Special thanks to Bert Lenten (Executive Secretary), Sergey Dereliev (Technical Officer) and the members of the AEWA Technical Committee for reviewing this paper, to Jolanta Kremer (Team Assistant) for proofreading the text and to Johannes Müller (Intern/ Consultant) for helping compile information.

This review would not have been possible without the cooperation of our contacts throughout the AEWA area who informed on the lead shot situation in their country. Thanks to all of the following people who helped by completing questionnaires or provided other related information:

Zamir Dedej and Elvana Ramaj, Albania
Amina Fellous and Hami Youcef, Algeria
Karen Jenderedjian, Armenia
Himat Alizadeh, Azerbaijan
Wouter Faveyts, Belgium
Pascal Gbethoho, Benin
Valeri Georgiev, Bulgaria
Namoano Yemboado, Burkina Faso
Damien Nindorena, Burundi
Kathryn Dickson, Canada
Mahamat Hassane Idriss, Chad
Abdourahaman Ben Houssen, Comores
Jerome Mokoko Ikonga, Congo (Republic)
Ange Alex Beda, Côte d'Ivoire
Ivana Jelenić and Dr. Jelena Kralj, Croatia
Pantelis Hadjigerou, Cyprus
Jiri Pykal, Czech Republic
Sten Asbirk and Niels Kanstrup, Denmark
Liina Vaher, Estonia
Belete Geda Torbi, Ethiopia
Áki Ármann Jónsson, Iceland
Vikberg Pentti, Finland
François Lamarque and Jean-Yves Mondain-Monval, France
Doris Henn, Germany
Irine Lomashvili, Georgia
Charles C. Amankwah, Ghana
Zenica Gosvig Larsen and Kate S. Rasmussen, Greenland
Namory Keita, Guinea
Kaoussou Diombera and Fai Djedjo, Guinea-Bissau
Zoltan Czirak, Hungary
Ohad Hatzofe, Israel
Alessandro Andreotti, Italy
Mahdi Quatrameez, Jordan
Alfred Owino, Kenya
Vilnis Bernards, Latvia
Lara Samaha and Rasha Kanj, Lebanon
Khaled S. Etayeb and Abdulmoula A. Hamza, Libya
Michael Fasel and Felix Naescher, Liechtenstein
Laura Janulaitienė, Lithuania

Sandra Cellina, Luxembourg
Alfousseini Semega, Mali
Stela Drucioc, Moldova
Hayat Mesbah and Mohamed Noaman, Morocco
Jan van Spaandonk, the Netherlands
John Hyelakuma Mshelbwala, Nigeria
Øystein Storkersen, Norway
Claudio Franco, Portugal
Atena Adriana Groza and Alina Frim, Romania
Mezhnev Anton Pavlovich, Russian Federation
Abba Sonko, Senegal
Marija Mladenovic, Serbia
Peter Pilinský, Slovakia
Dr. Abdullahi Mohamed Issa, Somalia
Dr. Raoul van der Westhuizen, South Africa
Barbara Soto-Largo, Spain
Khamis Dieng Ding, Sudan
Christer Pettersson, Sweden
Rolf Anderegg and Reinhard Schnidrig, Switzerland
Dr. Akram Eissa Darwish, Syria
Emmanuel L. M. Severre, Tanzania
Kotchipa Okoumassou and Kokou Trévé Tengue, Togo
Abdelhamid Karem, Tunisia
Christine Rumble, United Kingdom
Olexiy Mironenko, Ukraine
Carolina Lasen Diaz, Bern Convention
Henrik Harjula, OECD
Prof. Vernon Thomas, University of Guelph, Ontario, Canada
Helmut Kinsky, Deutsche Versuchs- und Prüf-Anstalt für Jagd- und Sportwaffen (DEVA)

Content

Foreword.....	5
A. Executive Summary (including recommendations).....	6
B. Report.....	11
I. Introduction	11
1. Background information	11
2. Aim.....	12
3. Methodology	12
4. Structure of this report.....	13
5. Regional division of countries.....	13
II. Convention and Agreements addressing the lead poisoning issue: Current situation and developments.....	15
1. The Convention on the Conservation of Migratory Species of Wild Animals (CMS)	15
2. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).....	15
3. Bern Convention (initiated by the Council of Europe)	17
4. European Union: Council Directive 79/409/EEC (Birds Directive)	18
5. The Ramsar Convention.....	19
6. Organisation for Economic Co-operation and Development (OECD).....	20
7. The Convention on Biological Diversity (CBD).....	20
III. International Hunting Organisations: Current view on the lead poisoning issue	21
1. The International Council for Game and Wildlife Conservation (CIC).....	21
2. FACE (Federation of Associations for Hunting and Conservation of the EU).....	21
IV. Current situation and developments in individual countries	23
1. Status quo in the different countries and progress made since 2000.....	23
2. General situation	24
a) Is there any hunting in wetlands with lead shot?	24
b) Is hunting in wetlands a large-scale activity?	24
3. Policy and legislation, including voluntary use of lead-free shot	25
a) Statutory and/ or voluntary ban on the use of lead shot for hunting in wetlands.....	25
b) Is the statutory ban enforced?	26
c) Which are the criteria of the ban on lead shot?.....	27
d) Commercial sale and possession of lead shot.....	27
e) Why do hunters not use lead-free ammunition?	28
f) Approaches to the problem other than through general statutory or voluntary measures	29
g) Monitoring of legal or voluntary measures to promote the use of lead-free shot for hunting in wetlands.....	29
h) Legislation considered?	29
4. Awareness	30
5. Research and development.....	32
a) Scientific research and publications.....	32
b) Development of lead-free shot	34
6. Coordination.....	35
V. Literature review.....	36
1. Scale of the problem.....	36
2. Solutions to the problem	37
3. Effectiveness of a legal ban on the use of lead shot for hunting (in wetlands)	38
VI. Conclusions and Recommendations	40
Annex 1: Status in individual countries overview (sorted by category in the year 2007)	44
Annex 2: Literature since 2000.....	50

Foreword

By Bert Lenten, Executive Secretary

In 2005 I was invited to respond to a scientific paper discussing the “Role of international conventions in promoting avian conservation through reduced lead toxicosis: progression towards a non-toxic agenda”. The authors of this article, Professor Vernon Thomas, University of Guelph, Ontario, and Prof. Raimon Guitart, University of Barcelona, Spain, raised the question “Why emphasise international conventions?” and pointed out that “it is the power of conventions to act on behalf of all their members, and in a consistent manner, that makes them so important.”

As already mentioned in my response to this paper, I agree it is a first and important step towards phasing out lead shot to have provisions in Multilateral Environmental Agreements such as AEWA. However, the work does not stop here. To implement such a provision, the cooperation of all stakeholders involved is essential. The combination of both is where I actually see the role and also the major achievement of AEWA during its work on the lead poisoning issue over the last years. Starting from zero the Agreement has provided a platform for a political consensus on a topic, which in most countries was not on the agenda yet. Meanwhile many countries have already phased out the use of lead shot for hunting in wetlands and the issue is internationally recognised, not only on the scientific, but also on the governmental level.

However, an important - I would even say - the most important, step in this development is moreover the agreement that has been reached with the hunting community on the need of phasing out the use of lead shot in wetlands, an issue which used to be opposed by most hunters and regarded as a threat for hunting in the past, and which is meanwhile considered as the hunters’ contribution to conservation. Much awareness is raised by the hunting organisations themselves, which are active in the process of phasing out the use of lead shot in wetlands; thus hunters in several countries have accepted the change towards using lead-free ammunition.

Particularly since the last update report in 2000, significant progress has been made. FACE and BirdLife International, in a common Agreement concluded under the Sustainable Hunting Initiative, as well as the CIC have set official targets for phasing out lead shot in wetlands in 2009 and 2010 respectively. The AEWA Secretariat, in a common effort with different experts on conservation as well as hunting organisations, has helped realise four regional workshops introducing the theoretical and technical know-how to countries where the issue of lead shot was not well known and not on the political agenda yet. Legal measures now exist in 17 countries within the AEWA area – most of them are Parties to AEWA -, and even more has been achieved on the level of political awareness, which is demonstrated by the fact that many more countries have started a process to phase out the use of lead shot for hunting in wetlands by developing new legislation or approaching the problem on a voluntary basis.

Finally, U.S. and Canadian studies on the compliance of hunters with a ban on the use of lead shot have meanwhile revealed a significant decrease of lead concentration in waterbirds, and thereby set encouraging examples of successful implementation of such a ban.

Although the present report clearly shows that we are still far from meeting the Action Plan’s target of phasing out lead shot, a great deal has been achieved and we can safely say that the “the situation is improving” and that AEWA has made a major contribution to this process. Voices from experts, even coming from the hunting community itself, asking for a total ban on lead shot, indicate that the issue might even evolve in future. However, more will have to be done in the nearby future and we count on the support of all Range States, and in particular of hunting organisations, to continuously support our efforts to ban the use of lead shot in wetlands.

The AEWA Secretariat sincerely hopes that the results of this review as well as the review on experiences made in countries that have phased out lead shot already, will help to start or accelerate the process in those countries that still have a long way to go. The examples of countries having successfully introduced legislation show that lead shot can be phased out, not against the will of its users, but by offering good alternatives.

January 2008

A. Executive Summary (including recommendations)¹

In brief:

1. Since 2000 progress has been made.
2. The use of lead shot for hunting in wetlands has meanwhile been banned in 13, partly banned in four and approached on a voluntary basis by four of the 118 AEWA Range States.
3. The countries deducted in which the problem is not relevant this makes, however, at least 60 % of the Range States to AEWA (and an estimated amount up to 82 % including non-responding countries) which still have to introduce a ban on hunting with lead shot in wetlands.
4. A lack of general awareness on the lead poisoning issue and acceptance of the fact that there is need for a change towards lead-free ammunition still represents the major problem.
5. FACE and the CIC have set respective deadlines for phasing out the use of lead for hunting in wetlands in 2009 and 2010.
6. There is urgent need for more action in order to phase out the use of lead shot for hunting in wetlands throughout the AEWA area as required in the AEWA Action Plan.

I. Introduction

This update report on the use of non-toxic shot for waterbird hunting reviews the progress made in phasing out lead shot for hunting in wetlands since the year 2000. It consists of five main sections: a review of conventions and agreements (chapter II) and international hunting organisations (chapter III) concerned with the issue; a description of the situation in individual countries (chapter IV); a literature review (chapter V) and conclusions and recommendations (chapter VI). The situation in individual countries was reviewed by means of a questionnaire distributed to the focal points of all AEWA Range States. Thus the report reflects the situation in 64 countries, namely 45 Parties (78 %) and 19 Non-Parties (18 Range States + Greenland²; 31 %) having submitted their answers to the questionnaire.

II. Conventions and Agreements addressing the lead poisoning issue: Current situation and developments

The **Convention on the Conservation of Migratory Species of Wild Animals (CMS)** is not immediately involved in phasing out lead shot for hunting in wetlands. Specific conservation measures are in fact to be provided by especially developed Agreements such as the **African-Eurasian Migratory Waterbird Agreement (AEWA)**. The Meeting of the Parties to **AEWA**, in reference to the legally binding Action Plan stating that Parties shall endeavour to phase out the use of lead shot for hunting in wetlands by 2000, passed a second resolution on the issue in 2002, *inter alia*, calling upon Contracting Parties to enhance their efforts to phase out the use of lead shot in wetlands as soon as possible, and to report back on progress made to each session of the Meeting of the Parties. The AEWA Secretariat, with the support of several donors, contributed to the realisation of four regional workshops on sustainable hunting (Romania 2001, Senegal 2004, Tunisia 2006, Jordan 2007), covering the issue of lead shot in theory and practice. Moreover, the Secretariat published a special newsletter on lead poisoning in waterbirds in English, French and Russian language³, a technical publication on non-toxic shot in English and French⁴, as well as various relevant articles, which were disseminated to hunting magazines. All publications as well as additional

¹ Please note that figures mentioned in this report exclusively relate to those countries which have provided their answers to the Secretariat (compare chapter B 5.).

² Greenland belongs to the Kingdom of Denmark.

³ <http://www.unep-aewa.org/publications/newsletter.htm>

⁴ Technical Series No. 3: Non-toxic shot - A path towards sustainable use of the waterbird resource; http://www.unep-aewa.org/publications/technical_series.htm

detailed information on the lead poisoning issue can be found on the AEWA website⁵. In addition to the present update report, the Secretariat is also producing an international review on experiences made in countries that have phased out the use of lead shot for hunting in wetlands.

The issue of lead shot has been recognised in the Guidance Document on Hunting under the Birds Directive⁶ and in the context of wise use, making clear that any use of lead shot that leads to deterioration of habitats or significant disturbance to birds is incompatible with the protection requirements of these sites.

The **Organisation for Economic Co-operation and Development** is planning a case study on lead in 2009 under its Pollutant Release and Transfer Programme work on Releases from Products.

A report on the Ecological effects of lead shot on terrestrial habitats and on the accumulation of lead in wild birds other than waterfowl was submitted as an information document to the Standing Committee of the **Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)** at its 24th meeting in 2004. The report suggested that the control of lead shot in wetlands would significantly reduce the risk of lead poisoning in raptors preying on waterfowl. Regarding terrestrial habitats, however, it concluded that, according to evidence existing at that time, the ban of lead shot was not to be regarded as a conservation priority. This document was not followed up by any recommendation or resolution. At its 27th meeting in 2007 the Standing Committee recommended Contracting Parties to the Convention, and invited Observer States and Organisations to apply the principles of the **European Charter on Hunting and Biodiversity** in the elaboration and implementation of their hunting policies so as to ensure that hunting is carried out in a sustainable way. Principle 5 of the Charter promotes the maintenance of environments that support healthy and robust populations of harvestable species under the rationale that wildlife species are vulnerable to pollutants and human impacts on their populations and habitats.

III. International Hunters' Organisations: Current view on the lead poisoning issue

The General Assembly of the **International Council for Game and Wildlife Conservation (CIC)** adopted a Resolution on "Problems of the Use of Lead Shot for Hunting in Wetlands" in 2003, urging governments and non-governmental bodies at national and international level to unite in order to increase awareness and education among hunters and to make relevant information on the problems of the use of lead shot for hunting in wetlands available. In May 2007 the CIC General Assembly moreover recommended national authorities in countries where lead shot is still used for hunting in wetlands to secure a process of phasing out such use as soon as possible, and at the latest before **2010**.

The **Federation of Associations for Hunting and Conservation of the EU (FACE)**, in the framework of the Sustainable Hunting Initiative, signed an agreement with BirdLife International in 2004, both organisations affirming their commitment to the Birds Directive objectives (and to its Guidance Document on Hunting). Under point 9 of the agreement both organisations explicitly ask for the phasing out of the use of lead shot for hunting in wetlands throughout the EU as soon as possible and definitely by **2009** at the latest. In 2006 FACE undertook a survey on the use of lead shot in its member countries showing that nearly half of its (surveyed) state members had introduced relevant legislation.

IV. Current situation and developments in individual countries

1. General situation

Hunting with lead shot in wetlands is still practiced in 78 % of the countries throughout the AEWA area and considered as being a large-scale activity in 31 % of these.

⁵ <http://www.unep-aewa.org/publications/index.htm>

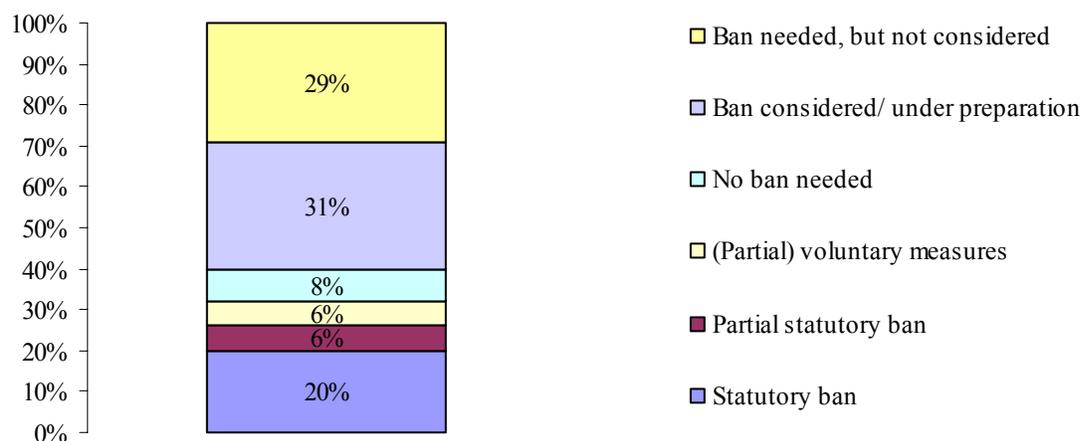
⁶ Council Directive 79/409/EEC

Recommendations:

1. Contracting Parties should enhance their efforts to phase out the use of lead shot in wetlands in accordance with self-imposed timetables.
2. All Non-Parties should be invited to become Contracting Parties to AEWA in order to participate in and find assistance with processes such as the phasing out of lead shot.
3. All Contracting Parties should, once a legal ban on the use of lead shot is operative, establish monitoring procedures to assess compliance with the ban and its effectiveness.

2. Policy, legislation and enforcement

a) Ban on the use of lead shot for hunting waterbirds/ in wetlands



Graph 1: Overview of the (legal) situation concerning the use of lead shot for hunting in wetlands in the AEWA area in 2007.

Since 2000 progress has been made concerning legislation to ban the use of lead shot for hunting in wetlands:

In the AEWA area, of the 64 countries having submitted questionnaires, meanwhile 13 countries (20 %) have introduced a total ban on the use of lead shot for hunting waterbirds/ in wetlands, 6 of them have done so since 2000⁷. An additional 4 countries have introduced a partial ban with limitations to certain wetlands, or have extended an already existing partial ban to additional parts of the (federal) countries (all of them since 2000⁸). New legislation since 2000 actually exclusively concerns Parties to AEWA (with one exception: Cyprus).

Legislation is, moreover, seriously considered in 20 further countries (31 %), of which at least 4 countries have already formally started the process. Some voluntary initiatives exist in 4 further (African) countries (6 %).

The countries were deducted, in which a ban is not needed for specific reasons (e.g. hunting banned), this leaves however at least 38 countries (60 %) still having to introduce measures in order to phase out the use of lead shot for hunting in wetlands. The latter concerns at least 67 % of the African countries, 33 % of the EU member states and 79 % of the Eurasian countries.

In most countries the statutory ban refers to all wetlands and/ or waterbirds. However, few countries have even introduced a total ban on the use of lead shot, or, in contrast, have chosen to restrict the ban to certain wetland areas only (e.g. Ramsar sites and other protected areas).

The commercial sale is banned in 7 countries (11 %) and its possession in 10 countries (16 %).

⁷ Belgium/ Wallonia 2005; Cyprus 2004; Czech Republic, valid as of 2010; France 2006; Slovakia, valid as of 2015; Spain 2001.

⁸ Hungary 2005; Germany (date depending on the respective Länder); Latvia 2000; UK/ Scotland 2005 and Wales 2002.

b) Enforcement

The legal ban, when existing and operative, is successfully enforced in most countries.

c) Reasons why hunters do not use lead-free ammunition

The lack of awareness of the issue is still the main reason why hunters in African and Eurasian countries do not use lead-free materials for hunting in wetlands. Within the EU, where many countries have already introduced a statutory ban, concerns related to the technical use of lead-free shot, which is considered to cause damage to the guns, to be less efficient, and also more expensive, play a more important role. The lack of availability of substitutes and the differences in prices compared to lead shot, however, are prominent concerns throughout the whole of the AEWA area.

d) Monitoring of legal or voluntary measures to promote the use of lead-free shot for hunting in wetlands

Eight of 21 countries having a legal ban or voluntary measures in place in order to phase out the use of lead shot, are/ have been active in monitoring the use of lead-free shot.

3. Awareness

In 52 % of the countries both, authorities and hunters, are not (sufficiently) aware of the issue of lead poisoning in waterbirds. On a regional level this applies to 58 % of the African, 26 % of the EU and 53 % of the Eurasian countries.

Recommendations:

- 1. Contracting Parties and Non-Parties should share existing information material on the use of lead shot for hunting in wetlands with other countries (e.g. through the AEWA website). The latter should consult all existing international and national information material, disseminate it to all stakeholders within the respective country (e.g. policy and decision-makers, NGOs, hunting organisations), and ideally produce own more adapted information material and/ or in own language.**
- 2. Contracting Parties should enhance communication between authorities and hunting communities in order to raise awareness on the issue of lead shot, to assess the feasibility of and steps needed for a switch to lead-free ammunition for hunting in wetlands and, most importantly, to reach agreement with the hunting community on the process towards doing so.**
- 3. Contracting Parties, e.g. through Conservation NGOs or hunting organisations, should put emphasis on the education of hunters in theory and practice, in order to convince them about the need of using lead-free ammunition, to inform about substitute materials and provide them the practical know-how to use the lead-free shots. Especially gun proofing facilities should be available in all countries. Theoretical and practical know-how on the use of lead-free ammunition could e.g. be part of proficiency tests before obtaining a hunting license. Knowledge obtained through e.g. regional workshops such as organised in Romania, Senegal, Tunisia and Jordan, should be used and dispersed in the respective countries in order to obtain a high level of efficiency of such workshops.**
- 4. Hunting organisations should be invited to continuously raise awareness amongst their members about the need of a change towards lead-free ammunition for hunting in wetlands, to provide information on alternative shots and to assist members in acquiring the skills necessary to use these alternatives.**
- 5. Ammunition manufacturers should be encouraged to actively promote the use of lead-free ammunition for hunting in wetlands and to provide the appropriate information on its use.**
- 6. The AEWA Secretariat, funds permitting, should continue to disseminate knowledge and expertise at the international level by making information materials available and organising further workshops in different regions.**

4. Research and development

Scientific studies on the biological/ ecological impact of lead poisoning on waterbirds have been conducted in 31 % of the countries, most of them European-driven. Relevant papers and/ or articles have been published in 31 % of the countries. 17 % of the countries are active when it comes to develop lead-free ammunition and this figure refers mainly to EU member states and few Eurasian countries, while the entire African gun-shot production is currently exclusively based on lead.

5. Coordination

27 % of the countries have established working groups dealing with the issue. This includes ten (16 %), in which the use of lead shot for hunting in wetlands has not been (completely) banned yet, and seven (11 %) which became active since the update report 2000. Thus progress has been made in this respect.

V. Literature review

Since 2000 numerous studies and relevant papers have added evidence to the issue of lead poisoning in waterbirds caused by the ingestion of lead shot. The discussion has been broadened since recent papers have confirmed that the problem of lead poisoning also affects other ecosystems and bird species dependent on them. Published cases of poisoned waterbirds after ingestion of lead sinkers used for sport fishing might potentially be considered along with the lead shot issue under the framework of AEWA. Recent studies have moreover concentrated on the effect of lead poisoning of birds on human consumers, on the effectiveness of and the compliance of hunters with a ban on the use of lead shot, and on the testing of alternatives to lead shot.

Recommendations:

- 1. The Technical Committee should give advice on the relevance of the use of lead shot in terrestrial ecosystems for species covered by AEWA and provide its recommendations on this issue.**
- 2. The Technical Committee should give advice on the relevance of the use of lead sinkers for fishing for species covered by AEWA and provide its recommendations on this issue.**
- 3. Parties should be urged to stimulate and facilitate the production and availability of alternatives to lead shot in their country.**
- 4. The Secretariat should make available a list of relevant publications and links through its website.**
- 5. Ammunition manufacturers should be encouraged to develop and make available alternative ammunition throughout the AEWA area.**

B. Report

I. Introduction

1. Background information

Lead poisoning in waterbirds through the ingestion of spent lead shot is a classical example of unwise use of natural resources. Cartridges for hunting waterfowl each contain around 30 grams of lead. Only a few of all fired pellets actually hit the bird, the rest fall to the ground or into the water. Waterbirds can pick the pellets from the bottom and ingest them, mistaking them for food items or grit which is retained in the gizzard to facilitate the grinding of food. The acidic stomach fluids, combined with the grinding of the stomach, cause the pellets to dissolve. This is how lead enters the blood stream. Lead is a highly poisonous metal, causing severe anaemia and affecting the nervous and circulatory systems, liver and kidneys. Depending on the amount of pellets swallowed, birds could die within a few days or weeks. If a bird swallows only one pellet, it usually survives, although its immune system and fertility are likely to be affected. Also, even low concentrations of lead have a negative impact on energy storage, which affects the ability to prepare for migration. Conservation and hunting organisations therefore agree that the use of lead shot for hunting in wetlands should be phased out.

The African-Eurasian Migratory Waterbird Agreement (AEWA) addresses this issue directly in its legally binding Action Plan:

Paragraph 4.1.4 of the AEWA Action Plan:

Parties shall endeavour to phase out the use of lead shot for hunting in wetlands by the year 2000.

A series of international update reports on lead poisoning in waterbirds was produced by Wetlands International in the past, the latest published in 2000⁹. Their aim was to identify new developments in this field and to report on progress made in this issue.

Taking note of the outcomes and recommendations of the update review 2000 the Second Meeting of the Parties to AEWA, September 2002, Bonn, Germany, in its Resolution 2.2 on “Phasing out lead shot for hunting in wetlands”, called upon Contracting Parties “to enhance their efforts to phase out the use of lead shot in wetlands as soon as possible [...] namely, to promote communication between, and awareness within, authorities and the hunting community; to allocate resources for the enforcement of relevant laws; and to stimulate and facilitate the production and availability of non-toxic shot – and to actively inform themselves on the issue and its solutions. Contracting Parties were moreover requested to report to each ordinary session of the Meeting of the Parties on progress made to phase out lead shot in accordance with self-imposed and published timetables, and specify how they plan to overcome any problems encountered.

The same Meeting of the Parties adopted the International Implementation Priorities 2003 - 2007, one priority being the continuation of the production of the update reviews on lead poisoning in waterbirds. This priority was again adopted as part of the International Implementation Priorities 2006 - 2008 (priority number 11) by the Third Meeting of the Parties to AEWA, October 2005, Dakar, Senegal.

⁹ Previous reports were published in 1995 and 1997. The last update report “Beintema, N.H. 2001. Lead Poisoning in Waterbirds. International Update Report 2000. Wetlands International, Wageningen, The Netherlands” can be downloaded at http://www.unep-aewa.org/surveys/hunting_and_trade/wi_lead_poison_wbirds_en_2000.pdf

2. Aim

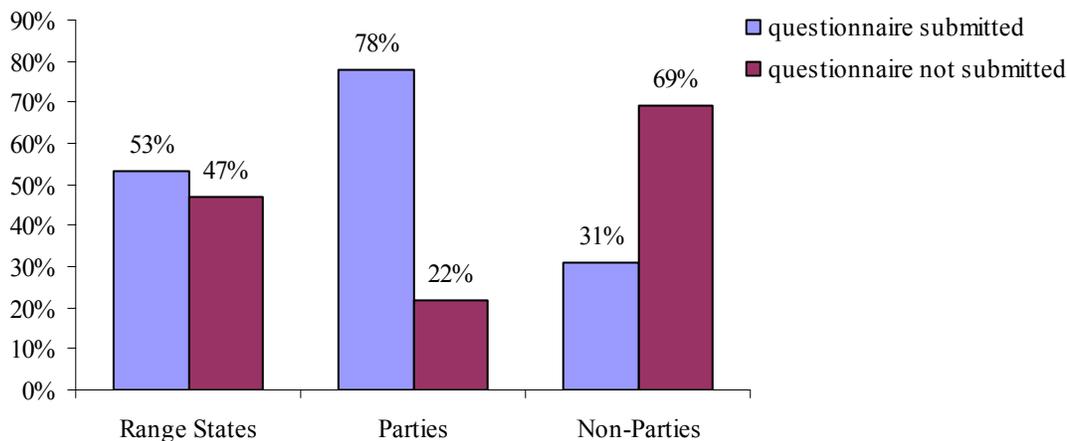
The current update review, produced by the AEWA Secretariat, implements priority number 11 of the International Implementation Priorities 2006 – 2008 by reviewing developments since the year 2000 regarding the use of non-toxic shot for hunting in wetlands in the AEWA area.

3. Methodology

The main tool for collecting information from the different countries has been a questionnaire on the use of lead shot for hunting in wetlands exclusively developed for the purpose of this survey and in close cooperation with the AEWA Technical Committee. The questions were based on the questionnaire used for the previous update report 2000, which would allow a comparison between the outcomes of this survey and of the previous one. The questionnaire has been distributed in the English and/ or French language to all governmental focal points throughout the AEWA region. Despite its efforts (regular reminders over approximately eight months) the Secretariat could not reach a full coverage of the AEWA region through the submitted questionnaires; the participation of **78 %** of the Parties (45 of 58 countries) is, however, considered as very successful. Moreover, notably 31 % of the Non-Parties (18 of 60 Range States + Greenland¹⁰) have submitted answers to the questionnaire, which shows clearly that there is also a strong interest in the Agreement's work and the issue of lead shot in countries that have not joined AEWA yet. The AEWA Secretariat has done its utmost to reach a high level of quality of the information received through the questionnaires; however the responsibility for delivered information stays with the respective national focal point.

In addition to the information received through the questionnaire around 70 relevant scientific papers, reports and articles published since 2000 have been reviewed. The selection of reviewed publications was based on bibliographical references either provided by national focal points or identified by the Compiler (Internet/ University library). Finally information has been received through correspondence with different stakeholders concerned with the issue.

This review contains information compiled since mid-2007.



Graph 2: The questionnaire on the use of lead shot for hunting in wetlands has been submitted by 64 countries of the AEWA area¹¹, namely 45 Parties (78 %) and 18 Non-Parties + Greenland (31 %).

¹⁰ Greenland belongs to the Kingdom of Denmark.

¹¹ The European Community not being a Range State but a regional economic integration organisation is left out of these calculations.

4. Structure of this report

This report consists of five main sections: chapter II and III respectively contain a review of conventions and agreements, and of international hunting organisations concerned with the issue of phasing out lead shot for hunting in wetlands. In chapter IV the current situation in individual countries is described; details are moreover provided in Annex 1. Finally, the main findings resulting from a review of literature published since 2000 have been summarised in chapter V, followed by Conclusions and Recommendations in chapter VI.

5. Regional division of countries

In order to present results for certain regions across the AEWA Range, the following scheme has been used:

Countries marked in **bold letters** have returned the questionnaire.

Region 1 – African countries (referred to as “Africa”)

Contracting Parties (16):

Algeria, Benin, Congo (-Brazzaville), Djibouti, Egypt, Equatorial Guinea¹², the Gambia, **Ghana, Guinea, Guinea-Bissau, Kenya, the Libyan Arab Jamahiriya,** Madagascar, **Mali,** Mauritius, Niger, **Nigeria, Senegal, South Africa, Sudan, Togo, Tunisia,** Uganda, **the United Republic of Tanzania.**

Non-Contracting States / Signatory States (8):

Angola, Botswana, **Burkina Faso, Burundi,** Cameroon, Central African Republic, Cape Verde, **Chad, Comoros, Côte d’Ivoire,** Democratic Republic of the Congo (Congo-Kinshasa), Eritrea, **Ethiopia,** Gabon, Lesotho, Liberia, Malawi, Mauritania, **Morocco,** Mozambique, Namibia, Rwanda, Sao Tome and Principe, Seychelles, Sierra Leone, **Somalia,** Swaziland, Zambia, Zimbabwe.

Region 2 – European Union member states (referred to as “EU”)

Contracting Parties (19):

Belgium, Bulgaria, the Czech Republic, Denmark (including Faroes), Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom of Great Britain and Northern Ireland.

Non-Contracting States / Signatory States (2):

Austria, **Cyprus, Estonia,** Greece, Malta, Poland.

Region 3 – Non-EU European and Asian countries including Canada (referred to as “Eurasia”)

Contracting Parties (10):

Albania, Croatia, Georgia, Israel, Jordan, Lebanon, Republic of Moldova, The Former Yugoslav Republic of Macedonia, Monaco, **Switzerland, the Syrian Arab Republic, Ukraine,** Uzbekistan.

Non-Contracting States / Signatory States (9):

Andorra, **Armenia, Azerbaijan,** Bahrain, Belarus, Bosnia and Herzegovina, **Canada, Greenland¹³, Iceland,** Iran (Islamic Republic of), Iraq, Kazakhstan, Kuwait, **Liechtenstein,** Montenegro, **Norway,** Oman, Qatar, the **Russian Federation,** San Marino, Saudi Arabia, **Serbia,** Turkey, Turkmenistan, the United Arab Emirates, Yemen.

¹² Equatorial Guinea has not submitted its answers to the questionnaire, but has informed the Secretariat that no specific legislation on hunting or trade concerning the species listed in Table 1 of AEWA exists; however conservation is directly or indirectly regulated through legislation on environmental issues such as the national law on CITES or on water and coast.

¹³ Greenland belongs to the Kingdom of Denmark.

Whenever this document delivers figures in reference to the “countries”, the different regions (“Africa”, “EU” and “Eurasia”) or to “Range States”, “Parties” and “Non-Parties” exclusively those countries are implied which have provided their answers to the Secretariat according to the above overview. When Parties and Non-Parties as well as the different regions are compared one should keep in mind that the different groups do not consist of the same amount of countries.

The European Community as a regional economic integration organisation and not a Range State, did not participate in the survey, which was designed for state governments.

II. Convention and Agreements addressing the lead poisoning issue: Current situation and developments

The selection of conventions and agreements presented is not meant to be exhaustive, but to provide an overview of major initiatives and activities in the AEWA area.

1. The Convention on the Conservation of Migratory Species of Wild Animals (CMS)¹⁴

CMS, also known as the Bonn Convention, was concluded in 1979 and is administered by UNEP. It aims to conserve terrestrial, marine and avian migratory species throughout their range. The particular focus is on coordinated species conservation and management, conservation and restoration of habitat, control of factors impeding migration, co-operative research and monitoring, and public education and exchange of information among Parties. Its implementation is assured through especially developed Agreements, Memoranda of Understanding and Action Plans.

CMS is not immediately involved in the issue of lead poisoning in migratory waterbirds and the phasing out of lead shot for hunting in wetlands. The implementation of conservation measures for migratory waterbirds included in Appendix II of CMS, and with respect to the countries along the African-Eurasian flyway, is explicitly provided by AEWA. According to Article V of the Convention Agreements such as AEWA should cover the whole of the range of the migratory species concerned and shall deal with all aspects of the conservation and management. The AEWA Action Plan thus provides for specific conservation measures, *inter alia*, with respect to the phasing out of lead shot for hunting in wetlands.

2. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)¹⁵

AEWA was concluded under the auspices of CMS on 16 June 1995 in The Hague, the Netherlands and entered into force on 1 November 1999. Since then the Agreement has the status of an independent international treaty. It covers 235 species of migratory birds ecologically dependent on wetlands for at least part of their annual cycle in Europe, parts of Asia and Canada, the Middle East and Africa. The Agreement provides for coordinated and concerted action to be taken by the Range States throughout the migration system of waterbirds to which it applies. Of the 119 Range States (118 countries and the European Community) currently 58 and the European Community¹⁶ have become a Contracting Party to AEWA. Parties to the Agreement are called upon to engage in a wide range of conservation actions which are described in a comprehensive Action Plan. This detailed plan, which is annexed to the Agreement text and legally binding, addresses key issues including the management of human activities such as unsustainable hunting in migratory waterbirds, and especially also the issue of the use of lead shot for hunting in wetlands:

According to paragraph 4.1.4 of the AEWA Action Plan “*Parties shall endeavour to phase out the use of lead shot for hunting in wetlands by the year 2000*”.

Based on this obligation and related resolutions and projects, which have been adopted by the Meeting of the Parties in order to meet the set goal, the Agreement has been very active on the lead poisoning issue for many years:

AEWA Resolutions:

Relevant resolutions have been adopted respectively at the First and Second session of the Meeting of the Parties, being

- Resolution 1.14 on phasing out lead shot (1999)¹⁷

¹⁴ <http://www.cms.int>

¹⁵ <http://www.unep-aewa.org>

¹⁶ As of 1 January 2008.

¹⁷ http://www.unep-aewa.org/meetings/en/mop/mop1_docs/pdf/r14.pdf

- Resolution 2.2 on phasing out lead shot on hunting in wetlands (2002)¹⁸

AEWA Conservation Guidelines (adopted by MOP1 in 1999):

The issue of lead poisoning is addressed in two of the published AEWA Conservation Guidelines:

- Conservation Guidelines on identifying and tackling emergency situations for migratory waterbirds¹⁹
- Conservation Guidelines on sustainable harvest of migratory waterbirds²⁰

AEWA awareness raising and education activities:

In order to raise awareness on the issue of lead poisoning in waterbirds, which was not recognised as being a problem in many countries for a long time, the AEWA Secretariat has undertaken a series of awareness raising and education activities including regional workshops, the publication of information material and, most recently, the development of relevant international reviews.

Regional workshops on sustainable hunting (including the issue of lead shot in theory and practice):

- Romania (2001): This workshop, organised by the AEWA Secretariat in close cooperation with FACE and with financial support of CIC and Switzerland, was attended by representatives of hunting organisations in Eastern Europe and aimed to raise awareness on the impact of lead poisoning and to make hunters familiar with substitutes for lead shot through practical instruction sessions.
- Senegal (2004): This workshop, organised by ONCFS, OMPO and Wetlands International with technical support from the Senegalese government and co-funding from the AEWA Secretariat, the Ramsar Bureau, Wetlands International, CIC and Fédération National des Chasseurs (France), was attended by representatives of governments, hunting organisations and conservation NGOs in Western and Central Africa, which were introduced into the issue of lead poisoning through a theoretical and a practical shooting session.
- Tunisia (2006): This workshop was organised in the framework of the BirdLife's LIFE project on Sustainable Hunting of Migratory Birds in the Mediterranean Third Countries (Algeria, Morocco, Egypt, Tunisia, Jordan, Lebanon, Palestine Authority and the Syrian Arab Republic) and with co-funding from the AEWA Secretariat. Attended by representatives of governments, hunting organisations and NGOs from the region as well as experts from Europe, it resulted in two regional documents, being the Guidelines for Sustainable Hunting of Migratory Birds in Mediterranean Third Countries and a Code of Practice for Responsible hunting of Migratory Birds.
- Jordan (2007): This was the second workshop in the framework of the BirdLife's LIFE project on Sustainable Hunting of Migratory Birds in the Mediterranean Third Countries, organised with co-funding from the AEWA Secretariat and attended by representatives of governments, hunting organisations and conservation NGOs from the region as well as observers from Iraq, Qatar and Saudi Arabia and experts from Canada and Europe. One day of the 2-day workshop was entirely dedicated to the lead shot issue containing a theoretical and practical shooting session.

Information material:

- Special Newsletter on lead poisoning in waterbirds (2002), available in English, French and Russian at <http://www.unep-aewa.org/publications/newsletter.htm>

¹⁸ http://www.unep-aewa.org/meetings/en/mop/mop2_docs/resolutions-word/pdf/resolution2_2.pdf

¹⁹ http://www.unep-aewa.org/publications/conservation_guidelines/pdf/cg_2.pdf

²⁰ http://www.unep-aewa.org/publications/conservation_guidelines/pdf/cg_5.pdf

- Technical Series No. 3: Non-toxic shot - A path towards sustainable use of the waterbird resource, available in English and French at http://www.unep-aewa.org/publications/technical_series.htm
- Three articles published by the AEWAs Secretariat and disseminated to hunting magazines: 1. Planting seeds of awareness; 2. Steel shot – some technical and safety aspects; 3. Non-toxic shot is gaining territory; available at <http://www.unep-aewa.org/publications/index.htm>
- Detailed information provided on the AEWAs website at <http://www.unep-aewa.org/activities/index.htm>

AEWA international reviews:

- The present update report on the use of non-toxic shot for waterbird hunting
- Review on experiences made in countries which have phased out lead shot or are endeavouring to phase it out

AEWA National Reports:

In its Resolution 2.2 on phasing out lead shot for hunting in wetlands the Meeting of the Parties, *inter alia*, called upon Contracting Parties to report to each ordinary session of the Meeting of the Parties on progress made to phase out lead shot. The AEWAs Secretariat prepared a synthesis report on the issue on the basis of information provided by Parties and Signatories on phasing out lead shot use in wetlands before the Third Meeting of the Parties in October 2005²¹. Reports were submitted by 18 Parties and 1 Signatory. According to the information received lead shot use in wetlands had been phased out by 9 countries, being Kenya²², Belgium, Denmark, Hungary, Netherlands, Spain, Sweden, Switzerland, UK; it was in the process of being phased out in 3 countries, being Croatia, Germany and Slovakia; in 6 countries lead shot had not been phased out yet, namely in Congo, Tanzania, Ireland, Luxembourg, Macedonia and Slovenia. Finally, Mauritius reported back that the issue of lead shot was not an issue of concern in Mauritius.

Although the present review shows that progress in phasing out the use of lead shot for hunting in wetlands is continuously being made, it is also clear that there is still a long way to go in order to have it banned throughout the whole Agreement area. The AEWAs Secretariat will therefore continue its activities in raising awareness on this issue and urge Parties and Non-Parties to endeavour phasing out the use of lead shot.

3. Bern Convention (initiated by the Council of Europe)²³

The Bern Convention, which was initiated by the Council of Europe, an independent, intergovernmental organisation with several humanitarian, democratic, and cultural aims including environmental protection, entered into force in 1982. The Bern Convention is open to all 47 member states (including all 27 EU states) of the Council of Europe as well as to Pan-European and African non-member states and the “European Economic Community”. So far, it has been ratified by 39 member states, the European Community and four non-member states.²⁴ To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992.

The Convention aims to protect rare and endangered animal and plant species and natural habitats. It lists protected species, contains provisions for protecting natural habitats, regulates the methods used to exploit certain species, and requests states to regulate trading in animals, particularly rare species. Special attention is given to endangered and vulnerable species, including endangered and vulnerable migratory species specified in appendices.

²¹ As decided at the Third Meeting of the Parties the synthesis report was updated after MOP3 and therefore contains information up until 14 February 2006.

²² Contradictory to the information provided through the questionnaire on lead shot for the present review.

²³ <http://conventions.coe.int/Treaty/Commun/QueVoulezVous.asp?NT=104&CM=8&DF=1/22/2008&CL=ENG>

²⁴ As of 1 November 2007.

In 1991 the Standing Committee of the Bern Convention adopted Recommendation 28 on the use of non-toxic shot in wetlands.

A document on “Ecological effects of lead-shot on terrestrial habitats and on the accumulation of lead in wild birds other than waterfowl” was submitted to the 24th Standing Committee meeting of the Bern Convention in 2004 as an information document.²⁵ In its recommendations the document points out that the lead poisoning risk for raptors preying on waterfowl would be significantly reduced by the control of lead shot use on wetlands. Concerning terrestrial habitats the document suggests that evidence is not sufficient to make a ban on lead shot in these areas a conservation priority, but that a framework for the monitoring of the consequences of lead shot use should be produced in order to define the acceptable level of lead contamination due to this source and its impact on the populations of terrestrial bird species. This document was, however, not followed up by any recommendation of the Standing Committee.

At its 27th meeting in 2007 the Standing Committee of the Bern Convention recommended Contracting Parties to the Convention, and invited Observer States and Organisations, to take into consideration the European Charter on Hunting and Biodiversity tabled at the same meeting, and to apply its principles in the elaboration and implementation of their hunting policies so as to ensure that hunting is carried out in a sustainable way. Principle 5 of the Charter promotes the maintenance of environments that support healthy and robust populations of harvestable species, under the rationale that wildlife species are vulnerable to pollutants and human impacts on their populations and habitats.

4. European Union: Council Directive 79/409/EEC (Birds Directive)²⁶

The European Union, supranational organisation of 27 European countries, has increasingly focused on environmental regulation, as far as transboundary issues are concerned. One instrument for this kind of regulation is the adoption of EU Directives. These legal instruments address EU member states, providing a binding framework for implementation as national legislation. They are also a means for union-wide nature protection. To address the issue of wild birds’ protection, the Birds Directive was adopted by EU bodies in 1979. In contrast to the more general Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora), adopted in 1993, it particularly addresses bird protection. Its annexes feature a list of bird species that are particularly threatened and need special conservation schemes (such as Species Action Plans). To achieve this, on the one hand, it regulates conservation of listed habitats through Special Protection Areas, a network of protected sites in EU member states. On the other hand, it provides detailed and extensive requirements on bird protection, addressing issues such as hunting in wild birds.

The issue of lead shot is neither explicitly addressed in the Birds or Habitat Directive, nor in any other relevant Directive²⁷. However, as outlined in the (non-binding) Guidance Document on Hunting under the Birds Directive any use of it in Special Protection Areas that leads to deterioration of habitats or significant disturbance to birds is incompatible with the protection requirements of these sites. The issue of the environmental pollution from lead shot arising from ammunition therefore needs to be considered in the context of wise use.

In 2001 the European Commission initiated its Sustainable Hunting Initiative (SHI) under the auspices of the Birds Directive with a view to developing cooperation between the primary organizations concerned with the conservation and wise, sustainable use of European wild birds. A number of initiatives have resulted from the SHI such as the development of the Guidance Document on Hunting mentioned above, but also e.g. a bilateral agreement between FACE and BirdLife International stressing the clear commitment of both organisations to the Birds Directive and their recognition of sustainable hunting including a commitment to cooperate on the phasing out of lead shot in wetlands (see also under FACE, chapter II 2).

²⁵ Bana 2004, available at

http://www.coe.int/t/e/cultural_co-operation/environment/nature_and_biological_diversity/nature_protection/sc24_inf02e.pdf?L=E

²⁶ http://ec.europa.eu/environment/nature/index_en.htm

²⁷ e.g. the Directive to eliminate the use of lead wheel balance weights in 2005 (EC 2002).

Guidance Document on Hunting under Council Directive 79/409/EEC (Birds Directive):

Paragraphs 2.4.18 and 2.4.19: Wise use and habitat use

It is [...] important to ensure that the management of such [human] activities is carried out in a way that avoids disturbance which would significantly affect the conservation values of the sites in question. This is particularly relevant in wetlands where large concentrations of wild birds, including huntable species, occur. In the Commission's Communication on the wise use and conservation of wetlands¹ sustainable wetland resource use is identified as one of the key wetland issues. Specific reference is made to bird exploitation: "Waterfowl hunting in European wetlands is a popular leisure activity and can be an important source of income for wetland owners. Rightly, hunting associations are becoming an important driving force for wetland conservation. The principle of using the waterfowl resource in a sustainable way can substantially contribute to wetland conservation, providing it includes the use of non-toxic shot, the setting of bag limits, the creation of an adequate network of game refuges, and the adaptation of the hunting seasons to the ecological requirements of the species. These are also aspects covered by Council Directive [...] on the conservation of wild birds".

The issue of the environmental pollution from lead shot arising from ammunition also needs to be considered in the context of wise use. It is increasingly recognised that the use of lead shot poses a significant threat to wild birds and their habitats, especially wetlands. Whereas there is no explicit mention of lead shot in the Birds Directive any use of it in Special Protection Areas that leads to deterioration of habitats or significant disturbance to birds is incompatible with the protection requirements of these sites. The need to phase out the use of lead shot in wetlands has already been recognised in international forums such the Ramsar Convention and the African Eurasian Waterbird Agreement.

5. The Ramsar Convention²⁸

The Convention on Wetlands of International Importance, signed in Ramsar, Iran, in 1971 (and therefore commonly known as the Ramsar Convention), is an intergovernmental treaty which provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources, especially as a habitat for waterbirds. It is the only global environmental convention which specifically aims to conserve one type of ecosystem. There are presently²⁹ 155 Contracting Parties to the Ramsar Convention, with over 1,600 wetland sites included in the Ramsar List of Wetlands of International Importance. The Ramsar Convention urges its Contracting Parties to conserve wetlands and their species, and to use them sustainably ("wise use"). Naturally, this might also include hunting regulation (and bans) for certain areas. In this context, the Convention acknowledges the necessity to secure the livelihoods of people whose income depend on wetlands.

Recommendation 9 (Promotion of Hunting Research and Education) of the negotiating meeting held at Ramsar, Iran in 1971³⁰ addresses the conditions of hunting in internationally important wetlands. Firstly, this recommendation urges research organisations to obtain data on the breeding success, productivity and general mortality of the main species involved, and to carry out special studies on the effect of hunting on wildfowl populations. Secondly, it urges international and national hunters' organisations to encourage sportsmanlike methods in hunting, and stop actions which obviously lead to mass destruction or loss of waterfowl; intensify educational measures to improve hunters' knowledge of different species of waterfowl; and make hunters aware of their responsibilities for conservation and wise use of waterfowl resources through proper hunting practices. These aims are supposed to be achieved through the development and implementation of wetlands management plans.

²⁸ <http://www.ramsar.org/>

²⁹ As of November 2007.

³⁰ http://ramsar.org/key_final_act_1971.htm#recs

6. Organisation for Economic Co-operation and Development (OECD)³¹

The OECD, an intergovernmental organisation with representatives from 30 countries in North America, Europe and the Pacific, as well as the European Commission, has been investigating problems associated with lead as part of its Risk Management Programme in the 1990s. The work in this context, *inter alia*, especially resulted in a “Declaration on Risk Reduction for Lead” (1996) recommending actions, of which one was to restrict the use of lead shot in wetlands and promote the use of alternatives to lead sinkers in shallow waters.

No work on lead has been carried out by the OECD since the compilation of the update report 2000. However, under the OECD Pollutant Release and Transfer Register Programme work on “Releases from Products” is currently starting. This programme will include a case study on lead that will be undertaken in 2009.

7. The Convention on Biological Diversity (CBD)³²

The Convention on Biological Diversity (CBD), signed in 1992 at the Rio Earth Summit, made sustainable use of the components of biological diversity one of its’ three main objectives (Article 1). Sustainable use was defined in Article 2 of the Convention and was elaborated in Article 10. In 2000 a process to articulate practical principles and guidelines for sustainable use was started. Following regional thematic workshops and a synthesis workshop in Ethiopia in 2003, the 7th CBD Conference of the Parties meeting in Kuala Lumpur, Malaysia in 2004 adopted in decision VII/12 the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity. These are of general relevance and provide a framework for Governments and other stakeholders about how to ensure that their uses of biological diversity will not lead to its long-term decline. The use of non-toxic shot for hunting in wetlands, although not directly addressed, is however a good example of wise use as aimed for in the Addis Ababa Principles.

³¹ <http://www.oecd.org/>

³² <http://www.cbd.int/>

III. International Hunting Organisations: Current view on the lead poisoning issue

1. The International Council for Game and Wildlife Conservation (CIC)³³

The International Council for Game and Wildlife Conservation (CIC) is a politically independent advisory body aiming to preserve wild game. To achieve this goal CIC is promoting sustainable use of wildlife resources. Created in 1928 the organisation unites 32 states as members, universities, NGOs as well as private members and scientific experts from 82 countries.

The Migratory Bird Commission of the CIC has been concerned with the issue of lead poisoning for a number of years. In 1992 a resolution was issued on the subject. The AEWA workshops on non-toxic shot in Romania (2001) and Senegal (2004) were organised with a financial contribution from CIC. Also the practical part of these workshops were (co-)organised by CIC, where hunters themselves had the opportunity to practice shooting with non-toxic shot.

In May 2003 the CIC General Assembly adopted another Resolution on “Problems of the Use of Lead Shot for Hunting in Wetlands”, urging governmental and non-governmental bodies at national and international level to unite in order to increase awareness and education among hunters and to make relevant information on the problems of the use of lead shot for hunting in wetlands available; underlining the need for development of effective and realistic alternatives and the participation of manufactures and producers of hunting ammunition, who should be urged to play a proactive role; stating, that the principle of proportionality should apply in order to avoid unnecessary restrictions put on hunting, and that the work must be carried out under a realistic time frame; and finally underlining the importance of hunters on all levels to take part in all discussions on the future use of lead shot for hunting.

In May 2007 the CIC General Assembly, referring to the Resolution from 2003, recommended national authorities in countries where lead shot is still used for hunting in wetlands to secure a process of phasing out such use as soon as possible, and at the latest before the year 2010.

2. FACE (Federation of Associations for Hunting and Conservation of the EU)³⁴

The Federation of Associations for Hunting and Conservation of the EU (FACE) was founded in September 1977 by the national hunters’ associations of the Member States of the European Union. FACE membership is open to representative national hunters’ associations from all Council of Europe Member States, including those beyond the European Union borders. At present³⁵, it has members in 36 countries: the 27 EU countries plus Albania, Bosnia and Herzegovina, the Czech Republic, Hungary, Moldova, Montenegro, Norway, Serbia and Switzerland. Through its members FACE represents the interests of approximately 7 million European hunters.

FACE cooperates with a few other international sport shooting federations, as well as gun and ammunition manufacturing federations, in the European Shooting Sports Forum. This forum is associated with the International body for proof houses C.I.P. (Permanent International Commission for Firearms Testing) and Wetlands International. As an active member of IUCN (World Conservation Union) since 1987, FACE contributes to wildlife conservation in several ways. Its policy on all forms of hunting is aligned to the now universally accepted principle of “wise use”. In line with this policy, it aims to eliminate wasteful losses of bird populations and pollution of habitats. Hunters’ organisations are giving serious thought to lead poisoning through ingestion of deposited lead, in particular of waterfowl in wetland areas. Finally, FACE helped realise the AEWA workshop on sustainable hunting held in Romania in 2001.

³³ <http://www.cic-wildlife.org/>

³⁴ <http://www.face-europe.org/>

³⁵ As of May 2007.

In 2004 FACE and BirdLife International, in the framework of the European Commission's "Sustainable Hunting Initiative", signed an agreement stressing their clear commitment to the Birds Directive objectives including its Guidance Document on Hunting under the Birds Directive. Under point 9 of the Agreement, which identifies fields for future cooperation, both organisations request the phasing out of the use of lead shot for hunting in wetlands throughout the EU as soon as possible, and definitely by the year 2009 at the latest.

In 2006, the FACE Secretariat undertook a survey on the use of lead shot in its member countries, which showed that of the 25 countries, for which information had been made available, 12 countries had (at least partly) introduced a statutory or voluntary ban on the use of lead shot for hunting in wetlands.

Position paper on the use of lead shot for hunting (adopted by the FACE Board on 04.09.2004):

"[...] Although the accumulation of metallic lead in most wetland habitats is a slow process and that it has not been shown either that mortality among waterfowl from ingested lead shot has a significant impact on their population dynamics, FACE recognises, however, that these losses are incompatible with responsible hunting practice and with the public perception of hunters as thoughtful and caring managers of waterfowl and wetland resources.

The national hunters' organisations, both individually and as part of FACE, are

- promoting the development and commercial marketing of effective alternatives to lead shot, inter alia, by encouraging cartridge and shotgun manufacturers to give priority to this issue;
- Informing their members and stimulating their awareness of the issue;
- Maintaining dialogue with other international instruments (such as the African Eurasian Waterbird Agreement) in order to define solutions and future policies.

Significant progress has already been made, in particular in raising awareness amongst hunters for this issue but a number of practical aspects still need to be addressed. These relate in particular to the availability of effective and reasonable-priced alternatives to meet waterfowl hunters' needs, as well as to reliable and objective technical information on the performance of these alternatives.

FACE is of the opinion that any replacement for lead shot needs to be environmentally acceptable and that there is also a need for more guidance for countries subject to CIP regulations concerning the production and use of steel shot cartridges.

For FACE, the issue of lead shot replacement can only be addressed according to a realistic, not arbitrary, time-scale, by supporting research and development of lead alternatives as well as information programmes for waterfowl hunters, and by fully involving hunters in all these processes."

On 12 October 2004, FACE and BirdLife International signed an Agreement on Directive 79/409/EEC on the Conservation of Wild Birds as part of the European Commission's Sustainable Hunting Initiative (SHI), in which "both organisations recognise that the Birds Directive is an appropriate legal instrument for the conservation of both wild birds (including huntable species listed in Annex II of the Birds Directive) and their habitats at a favourable conservation status at EU level". FACE and BirdLife International moreover agreed "that the priority is to make the Directive work along the lines indicated in the Guidance Document on Hunting under Council Directive 79/409/EEC on the Conservation of Wild Birds¹". Under point 9) of the Agreement "both organisations ask for the phasing out of the use of lead shot for hunting in wetlands throughout the EU as soon as possible, and in any case by the year 2009 at the latest.

IV. Current situation and developments in individual countries

1. Status quo in the different countries and progress made since 2000

In order to allow clear conclusions about the progress made since the update report of 2000³⁶ the choice of this report has been to use a similar classification according to the schedule below:

Classification of countries which have responded to the questionnaire:

A: There is a total statutory ban on the use of lead shot for hunting in wetlands.

B: There is a partial statutory ban (certain species, certain areas) on the use of lead shot for hunting in wetlands.

C: There is a voluntary ban (or at least a voluntary use of lead-free shot by part of the hunters) on the use of lead shot for hunting in wetlands.

D: There is no statutory or voluntary ban, but hunting in wetlands with lead shot is only a small-scale activity.

E: There is no statutory or voluntary ban. Hunting in wetlands with lead shot is a large-scale activity. However, there is an awareness of the problem and legislation is being considered.

F: There is no statutory or voluntary ban. Hunting in wetlands with lead shot is a large-scale activity. There is no awareness of the problem and legislation is not being considered.

U: It is unknown to the informer whether lead shot is used for hunting in wetlands and whether there is any legislation concerning the use of lead shot.

N: There is currently no hunting in wetlands at all (e.g. no wetlands, total ban on all hunting or no reason given).

The table below gives an overview of the situation within the AEWA area using the classification according to the described schedule.

	2000 ³⁷		2007	
	#	%	#	%
A	6	10	13	20
B	8	14	4	6
C	1	2	4	6
D	16	27	20	31
E	4	7	10	16
F	14	24	8	13
U	1	2	0	0
N	8	14	5	8
total	58	100	64	100

Table 1: Comparison of results obtained in 2000 and 2007.

Although the use of lead shot for hunting in wetlands is far from being phased out throughout the whole of the AEWA area, good progress has nevertheless been made since 2000. Meanwhile 17 countries have introduced a legal ban on the use of lead shot, 13 of these for all wetlands (or even extended to other ecosystems) and 4 countries with a legal ban limited to certain important wetland areas. The current review covers five more countries than the report of 2000. The countries reflected in the categories A and B, however, are all covered by both reports (2000 and 2007) which allows for a meaningful synthesis:

³⁶ Beintema, N.H. 2001. Lead Poisoning in Waterbirds. International Update Report 2000. Wetlands International, Wageningen, The Netherlands.

³⁷ Although the update report 2000 covered countries worldwide the given figures for 2000 reflect only those countries, which are part of the AEWA area.

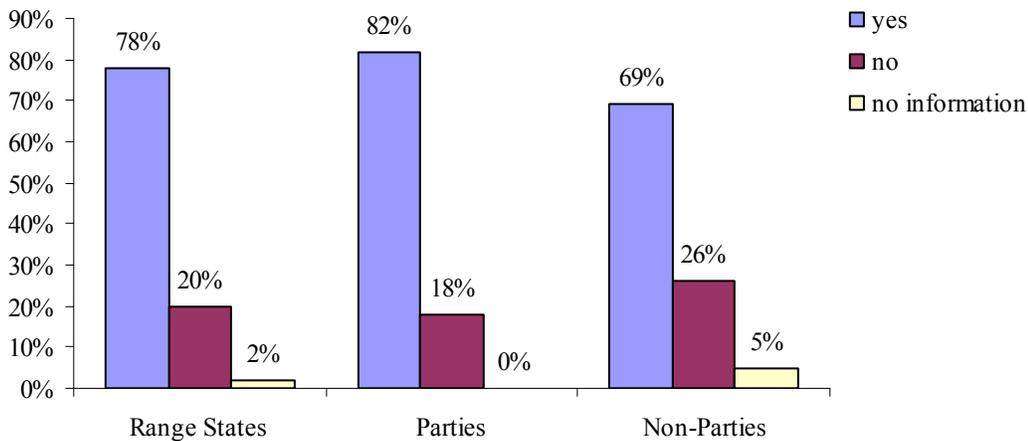
In comparison to the situation in 2000 in the category of countries having legally banned lead shot in all wetlands (A), there is an increase of more than 100 %. This increase is caused by 4 countries “upgraded” from category B to A, 1 country from D to A and 2 countries from category E to A.

New legislation since 2000 actually exclusively concerns Parties to AEWA (with one exception: Cyprus).

For details on the overall situation in individual countries please also see Annex 1.

2. General situation

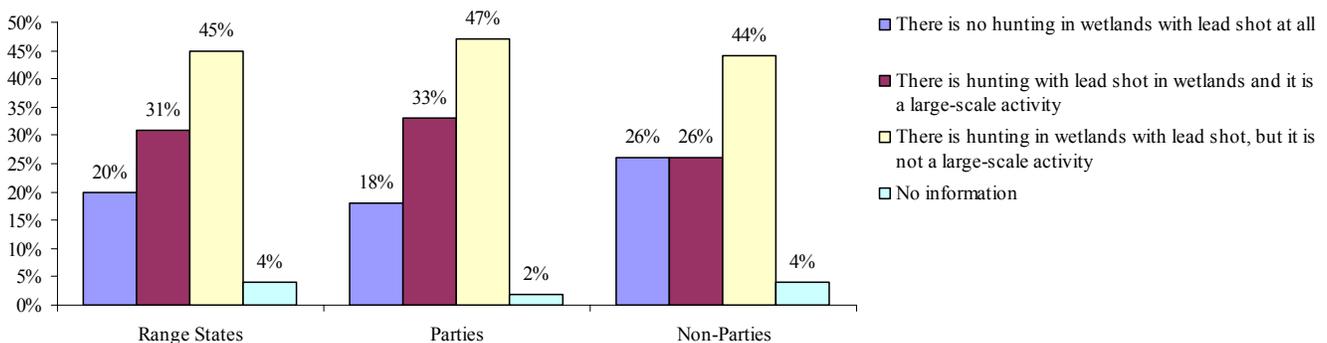
a) Is there any hunting in wetlands with lead shot?



Graph 3: Hunting in wetlands with lead shot still exists in 78 % of the countries in the AEWA area, namely in 82 % of the Parties and in 69 % of the Non-Parties (question 1a).

Hunting with lead shot in wetlands is reported to be practiced in 78 % of the countries in the AEWA area. A look into the different regions does not lead to significant differences (79 % of African, 71 % of EU and 84 % of Eurasian countries answered this question with a “yes”).

b) Is hunting in wetlands a large-scale activity?

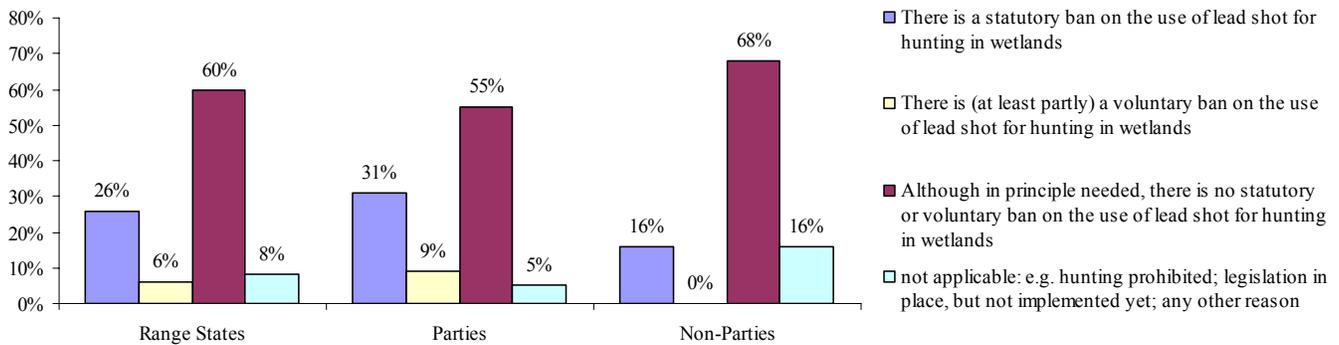


Graph 4: Hunting with lead shot in wetlands is a large-scale activity in 31 % of the AEWA Range States/ 33 % of the Parties/ 26 % of the Non-Parties (question 1b).

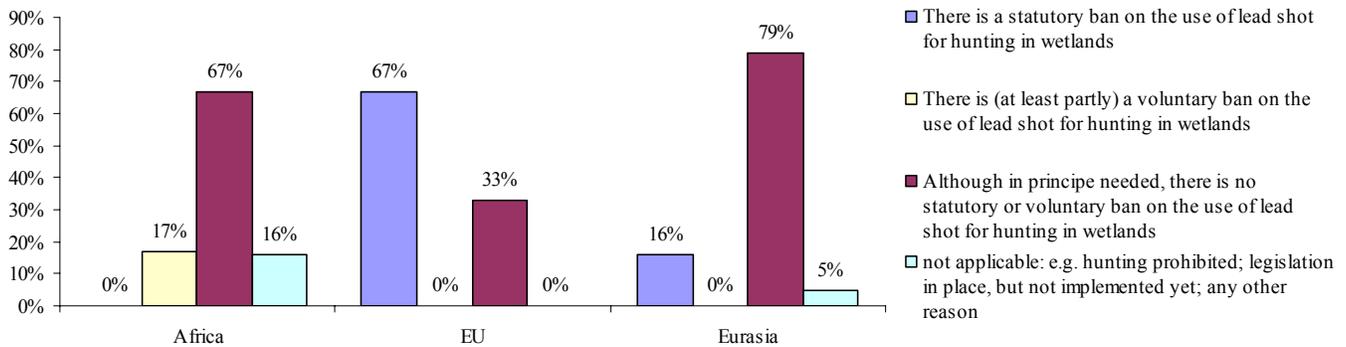
Asked whether hunting with lead shot in wetlands represents a large-scale activity this was denied by the larger share of countries in which lead shot is still being used (namely 45 % of all countries), while 31 % of the countries informed that this hunting practice does actually represent a large-scale activity.

3. Policy and legislation, including voluntary use of lead-free shot

a) Statutory and/ or voluntary ban on the use of lead shot for hunting in wetlands



Graph 5: Situation in the AEWA Range States/ Parties/ Non-Parties (questions 2a and 2c).



Graph 6: Comparison of the situation within the different sub-regions of AEWA (questions 2a and 2c).

An (at least partial) statutory ban on the use of lead shot for hunting in wetlands (or waterbirds) exists in 26 % of the AEWA Range States³⁸ which responded to the questionnaire. Additional 6 % of the Range States - exclusively African Parties, in which hunting waterbirds with lead shot is only a small-scale activity - are in the process of tackling the problem with voluntary initiatives.³⁹ In Europe voluntary measures currently still exist in two countries with federal systems, which have already introduced legislation, but where legal gaps are to be found for certain regions due to the federal systems of these countries (Germany, UK: these countries are reflected among those having a (partial) statutory ban).

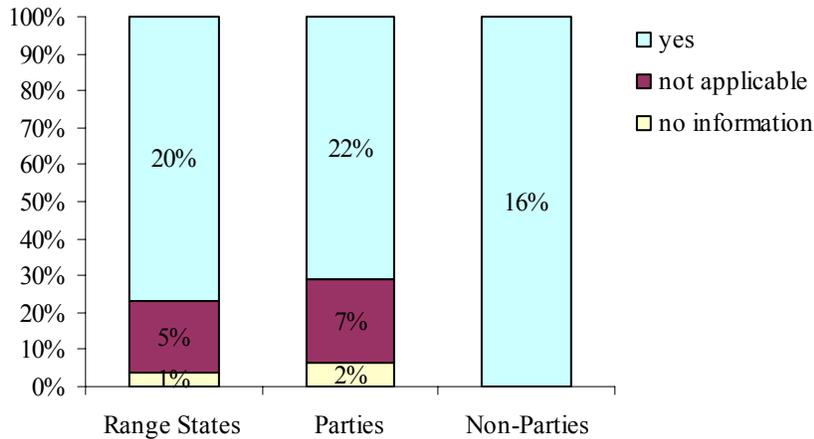
³⁸ 20 % have a total ban for hunting in wetlands (category A) and 6% a ban restricted to certain wetlands (category B).

³⁹ Benin, Guinea-Bissau, South Africa, Sudan (category C).

In all countries, in which the issue of banning the use of lead shot has not been approached yet – neither legally nor voluntarily -, and for which the issue is relevant (e.g. not already covered by a total ban on hunting) hunting with lead shot in wetlands actually exists, thus a ban, be it statutory or in a voluntary approach, is practically needed. Latter is the case for at least 60 % of the AEWA Range States, being 67 % of the African, 33 % of the EU and 79 % of the Eurasian countries.

The figures reflecting the answer “not applicable” especially include those countries in which currently a total ban on hunting is in force/ existing legislation is not implemented yet/ the question is not relevant for any other reason.

b) Is the statutory ban enforced?



Graph 7: Enforcement status in countries which have a legal ban on the use of lead shot for hunting waterbirds/ in wetlands (26 % of the Range States; 31 % of the Parties and 16 % of the Non-Parties – compare Graph 5) (question 2j).

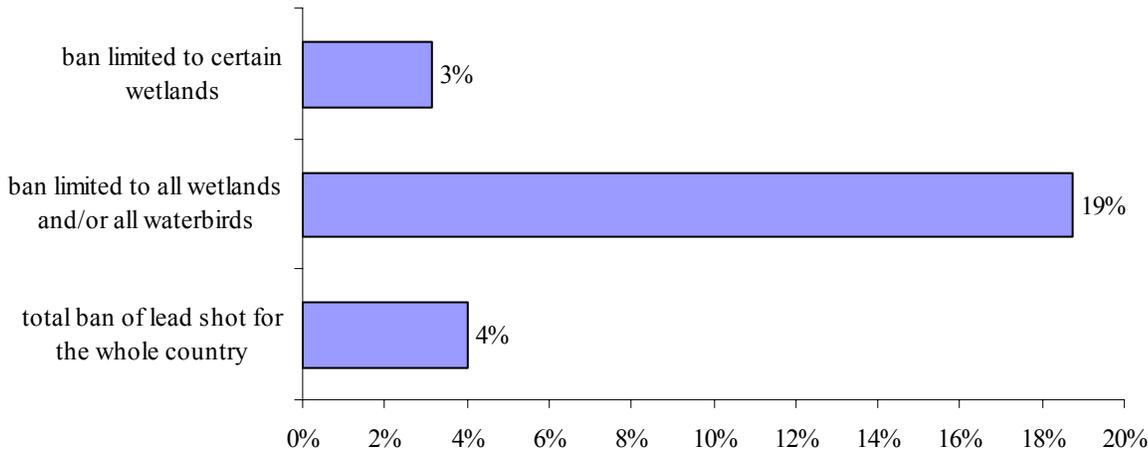
Basically all countries having a statutory ban on the use of lead shot in place informed that enforcement measures were established. The only exceptions are Sweden, where lead shot is not used for hunting in wetlands (anymore), as well as the Czech Republic and Slovakia, where the relevant legislation will be effective respectively in 2010 and 2015 only (“not applicable”). No information was provided by Spain.

Of all countries with an operative ban covering all wetlands/ waterbirds⁴⁰ only two (of 11⁴¹) still report about (illegal) hunting activities with lead shot in their country, thus in all other countries enforcement measures are supposed to be successfully implemented.

⁴⁰ Hunting with lead shot in wetlands still takes place in the countries of the category B (partial ban) and in those where the ban is not operative yet (Czech Republic and Slovakia).

⁴¹ 13 countries belong to the category A (total ban in wetlands); however two of these have a ban which is not operative yet.

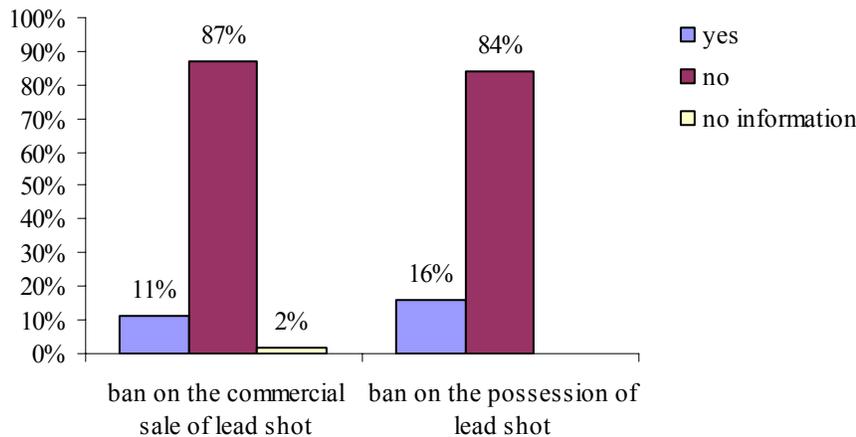
c) Which are the criteria of the ban on lead shot?



Graph 8: Among those countries, which have legally banned the use of lead shot (20 % (totally) + 6% (partially) = 26 % all in all) 19 % prohibit hunting with lead shot in all wetlands and/ or in all (hunttable) waterbirds; 3 % limit the prohibition only to certain wetlands and 4 % have a total ban throughout the whole territory.

Most countries which have a ban on lead shot apparently have limited the ban to all wetlands, while few countries have extended it to the whole territory⁴², and another two limited to only certain wetlands (e.g. Ramsar sites, nature reserves)⁴³.

d) Commercial sale and possession of lead shot



Graph 9: Ban on the commercial sale and possession of lead shot (questions 2e and 2f).

A ban on the commercial sale and possession of lead shot does not exist in most countries for the reason that lead shot is still allowed to be used for clay pigeon shooting, in other ecosystems than wetlands or for other species than waterbirds. However, according to the information received through the questionnaire, some countries have a ban on lead shot (or hunting in general) in place which also extends to its commercial sale and possession:

⁴² Denmark, the Netherlands, Norway.

⁴³ Hungary and Latvia.

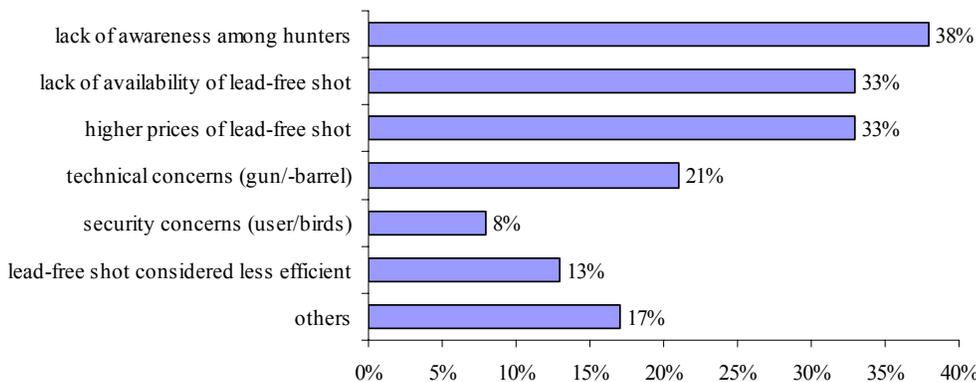
The commercial sale of lead shot is prohibited in: Denmark, Norway, Guinea Bissau, Libya, Burkina Faso, Chad and Côte d'Ivoire.

The possession of lead shot is prohibited in: Denmark, the Netherlands, Spain, Moldova, Norway, Guinea Bissau, Kenya, Libya, Chad and Côte d'Ivoire.

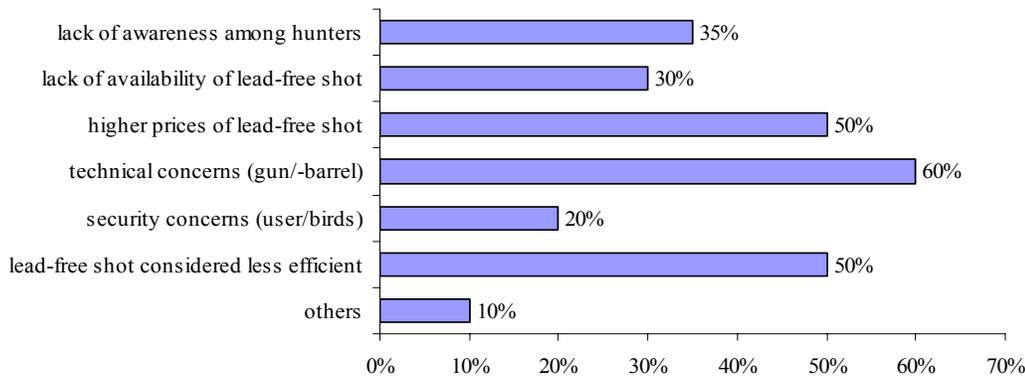
e) Why do hunters not use lead-free ammunition?

Countries were asked to select from a list the reasons why hunters do not use lead-free shot, or to name additional reasons, if existent. The following graphs reflect for each reason the percentage of countries having selected it (for most countries more than one reason was relevant). 22 % of all addressed countries, however, considered this question not applicable (e.g. no hunting at all, lead-free ammunition accepted by hunters). The remaining 88 % selected following reasons:

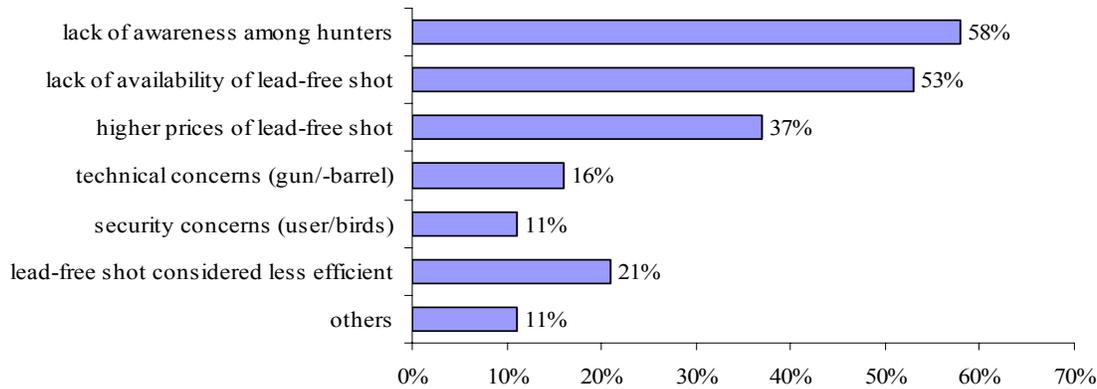
Africa:



EU:



Eurasia:



Graphs 10 - 12: Reasons mentioned why lead-free materials are not used by hunters in Africa, the EU and Eurasia (question 2g).

Other reasons mentioned by countries:

- The probably most important reason is the influence market strategies of cartridge producers have on the policy of the hunting associations (Italy)
- A by-law imposes the *exclusive* use of lead shot (Israel)
- Law makers are not interested in the impact of lead shot on birds (Ghana).

The lack of awareness is still the main reason why hunters in African and Eurasian countries do not use lead-free materials for hunting in wetlands. In consequence, concerns linked to the actual use of lead-free ammunition play a less important role. Within the EU, where many countries have already introduced a statutory ban, which usually goes along with an awareness and education campaign and, of course, an immediate obligatory change to lead-free ammunition, the lack of awareness is not the major problem (although still existing in at least 35 % of the EU countries). More dominant in this part of the AEWa area, are obviously concerns related to the technical use of lead-free shot, which is still considered to cause damage to the guns, to be less efficient, and also more expensive.

The lack of availability of substitutes and the differences in prices compared to lead shot are prominent concerns throughout the whole AEWa area.

f) Approaches to the problem other than through general statutory or voluntary measures

In Tanzania, the issue of the use of lead shot for hunting in wetlands is planned to be covered by single waterbird species conservation action plans, of which 11 are currently being developed.

g) Monitoring of legal or voluntary measures to promote the use of lead-free shot for hunting in wetlands

Eight of 21 countries having a legal ban or voluntary activities in place in order to phase out the use of lead shot, are or have been active in monitoring the use of lead-free shot.

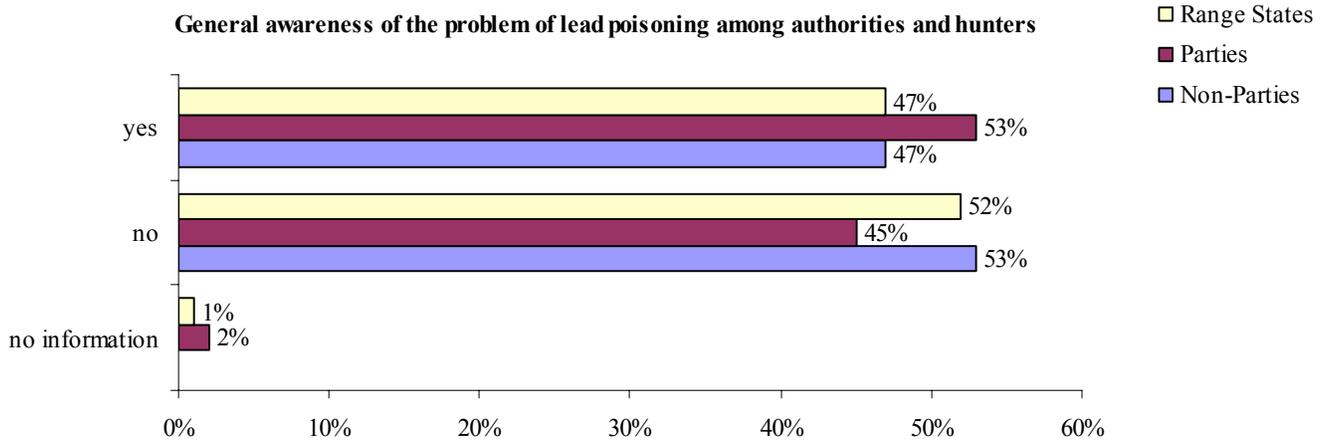
h) Legislation considered?

Twenty of 42 countries having no legal ban in place although hunting is, in principle, allowed⁴⁴, consider introducing legislation. At least four of these countries have already formally started the process.

⁴⁴ Including the countries which approach the problem with voluntary measures.

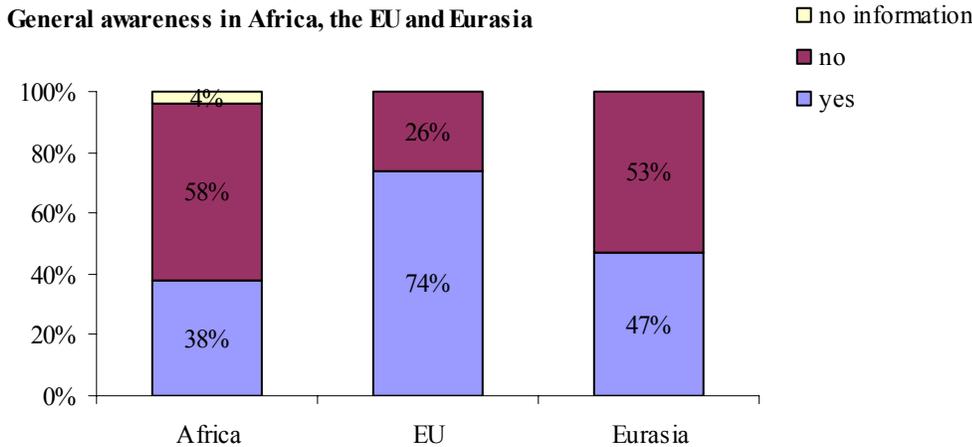
4. Awareness

The existence of a general awareness on the problem of lead poisoning in waterbirds among authorities and hunters was confirmed by 53 % of the Parties and 47 % of the Non-Parties, although some of these countries also signalled that there is still space for improvement. 45 % of the Parties and 53 % of the Non-Parties, however, clearly stated that awareness on the issue is lacking.



Graph 13: General awareness (question 3a).

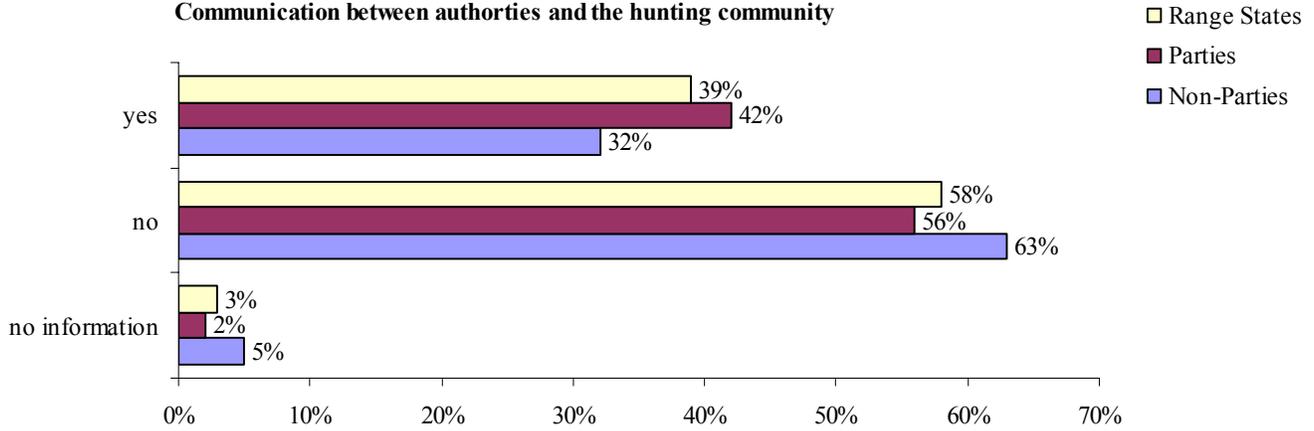
A look into the different regions shows that awareness most obviously needs to be raised in African countries, but also in more than half of the countries belonging to the Eurasian region:



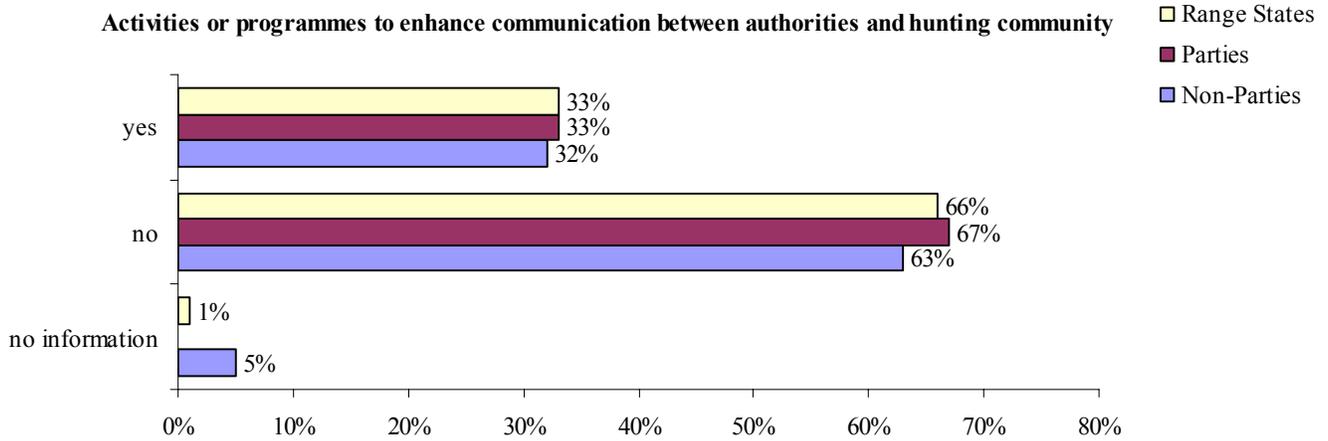
Graph 14: General awareness in Africa, the EU and Eurasia (question 3a).

Different awareness raising activities are being, or have successfully been, undertaken in the past by countries with respect to the issue of lead poisoning in waterbirds. The status of activities in the different countries can be summarised as follows:

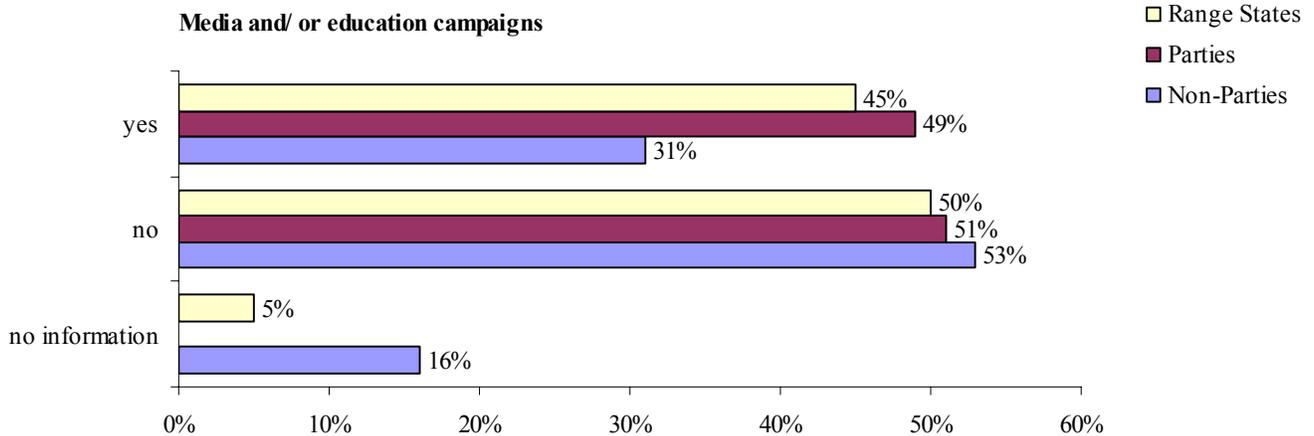
Communication between authorities and the hunting community

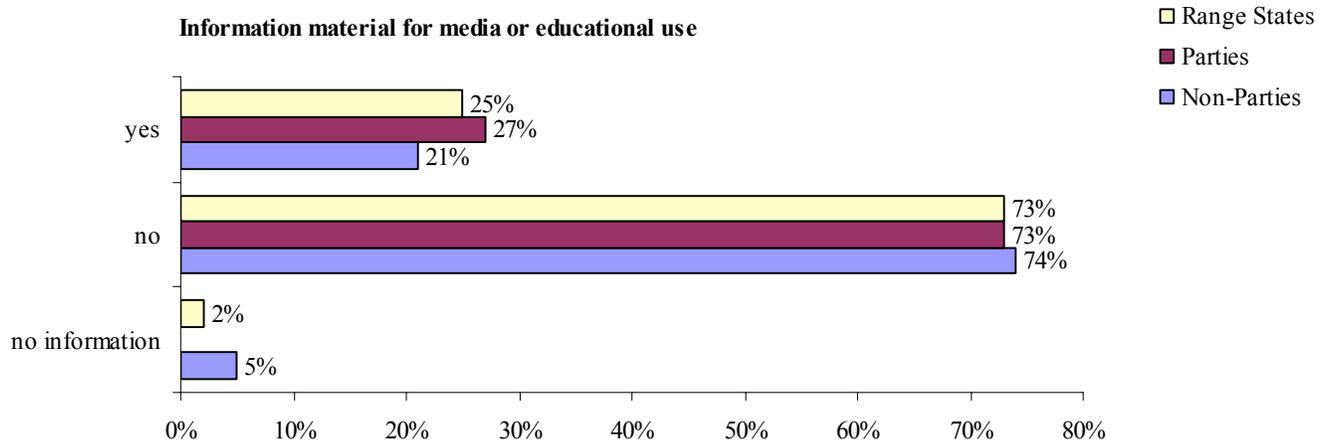


Activities or programmes to enhance communication between authorities and hunting community



Media and/ or education campaigns





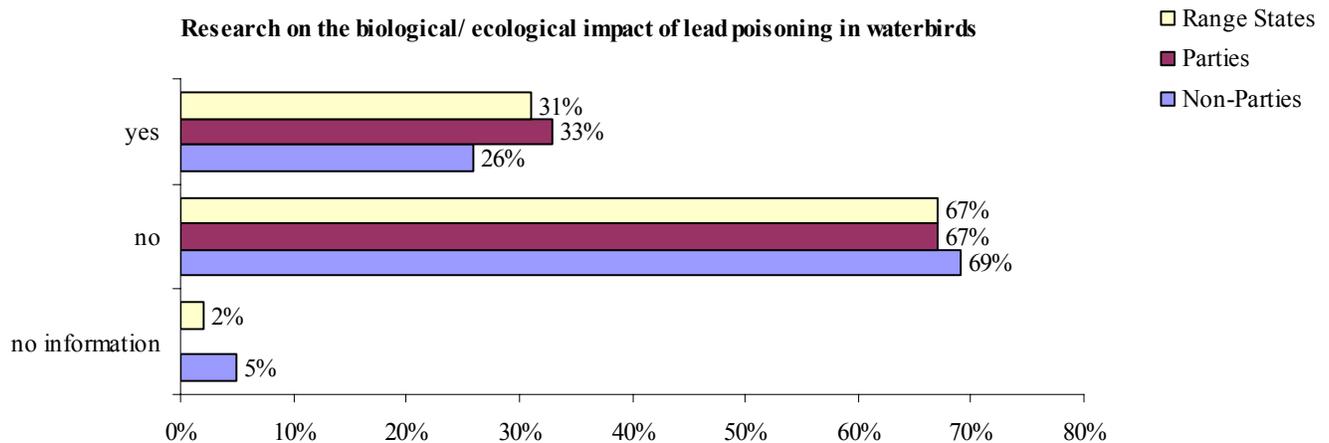
Graphs 15 – 18: Awareness raising activities taking place on the issue of lead poisoning in waterbirds in the AEWA area (questions 3b – 3e).

Media and/ or educational campaigns are the most frequently used tool to raise awareness on the issue of lead shot (45 % of the countries), while information material has been developed in only 25 % of the countries. Communication between authorities and hunters has been established in 39 % of the countries and activities or programmes to establish or enhance such communication exist in 33 % of the countries. It is worth mentioning that Parties to AEWA reach higher percentage figures in all questions raised on the level of “awareness” than Non-Parties.

However, according to the feedback received, authorities and hunters in nearly half of the countries in the AEWA area appear to still be unaware of the problem or at least not sufficiently informed.

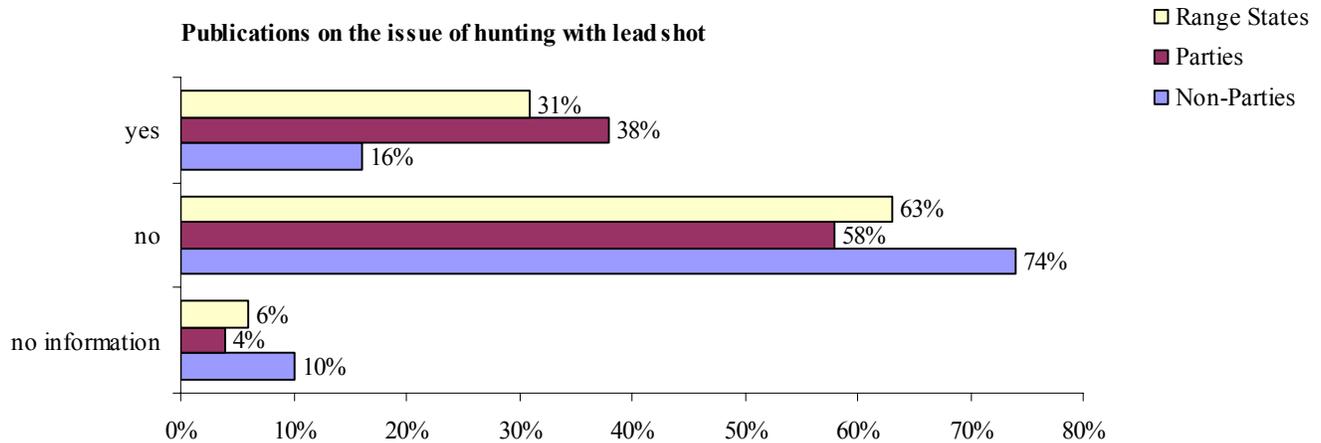
5. Research and development

a) Scientific research and publications



Graph 19: Research undertaken in the AEWA Range States/ Parties/ Non-Parties on the biological/ ecological impact of lead poisoning in waterbirds (question 4a).

Scientific studies on the biological and/ or ecological impact of lead poisoning in waterbirds have been undertaken in 31 % of the AEWA Range States, namely in 33 % of the Parties and 26 % of the Non-Parties, most of them European-driven, but also initiated by the countries of Algeria, Canada, Greenland, Iceland, Israel, the Russian Federation and Ukraine.



Graph 20: Publications developed on the issue of hunting with lead shot in the AEWA Range States/ Parties/ Non-Parties (question 4d).

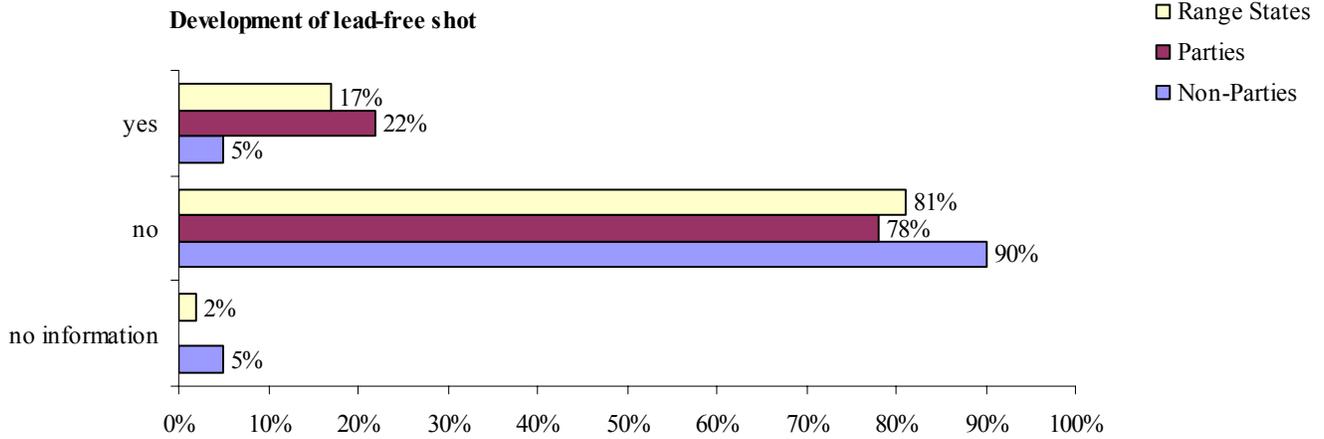
Scientific results have been published in papers or articles in 31 % of the countries (12 % of the African countries, 52 % of the EU member states and 32 % of the Eurasian countries). For the exact bibliographical references please see Annex 2.

Research undertaken in countries that have not yet phased out the use of lead shot for hunting in wetlands:

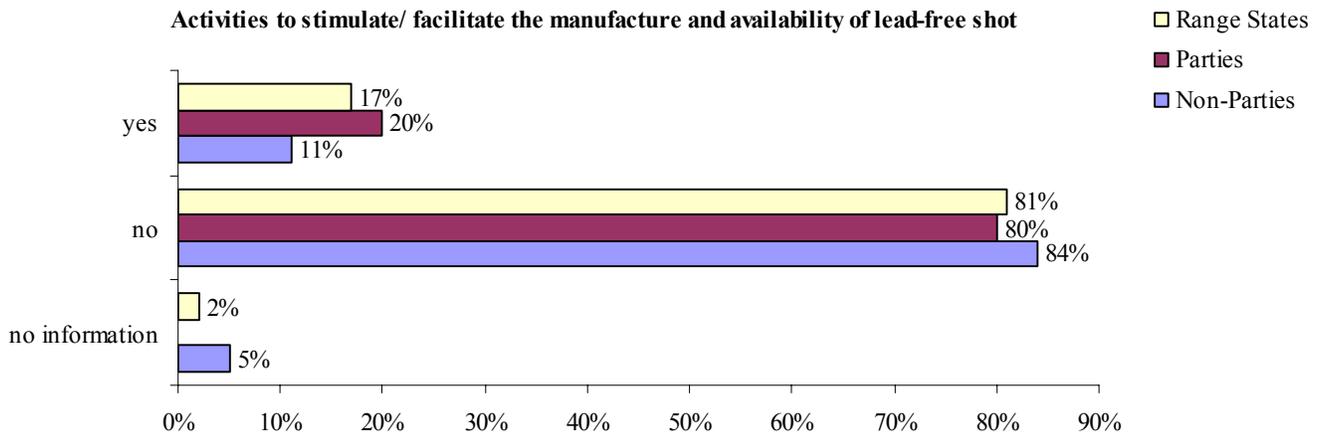
The lead shot contamination has been assessed in Ukraine in the 1990s resulting in scientific evidence that lead had been deposited in wetlands on a large-scale and affecting waterbirds (see references in Annex 2 [in Ukraine]). Lead levels in the liver of hundreds of wild birds per year and acute lead levels in blood of wild birds that require health care are being monitored in Israel. A first study in Algeria, undertaken by the University of Guelma, Algeria, has recently started, where the problem is supposed to be a large-scale one, lead shot being the only available ammunition. In Greenland research has revealed high proportions of eider ducks carrying embedded lead shot (Falk et al., 2006) and legislation is meanwhile under preparation. Preliminary monitoring with a focus on lead poisoning has taken place in Italy in 1995 (but with no follow-up). Moreover, it is reported from Portugal, Moldova, Romania and Iceland that relevant research is being done.

For more details on research and publications since 2000 please see the brief literature review in chapter V.

b) Development of lead-free shot



Graph 21: Development of lead-free shot in the AEWA Range States/ Parties/ Non-Parties (question 4b).



Graph 22: Activities undertaken in the AEWA Range States/ Parties/ Non-Parties to stimulate/ facilitate the manufacture and availability of lead-free shot (question 4c).

17 % of the countries are active in developing alternatives to lead shot and/ or stimulating their manufacture and availability.

Reported activities concerning the development of lead-free ammunition in countries covered by AEWA:

Lead-free ammunition is manufactured in the Czech Republic (Sellier and Bellot), Denmark (“one company”; moreover the sale of lead shot is banned); France (e.g. Nobel Sport), Germany, Italy, Latvia (“one company”), Sweden, the UK (several companies have developed lead-free ammunition and a company in Scotland has developed a special coating for lead shot that claims to prevent fatality when ingested by waterbirds) and the Russian Federation (company “Julia”). In Spain the National Hunting Federation conducts research on the development of a so-called ecological cartridge. In Sudan communication between the government and the local ammunition manufacturer has been established; the wildlife authorities have recommended the import of lead free shot as a solution until the local company starts producing lead-free ammunition. In Ukraine, the Institute on Foundry has elaborated a technology of steel shot production in the first half of the 90s.

The production of lead ammunition only, with no production of lead-free ammunition being expected, is, in contrast, reported from Algeria and the Republic of Congo (the latter is reported to service the whole of Central Africa with lead ammunition).

Explicitly relying on import products:

Albania, Finland, Georgia (from Russia and Turkey), Hungary, Mali, Moldova (from Italy), Luxembourg, Norway (the sale of lead shot is moreover banned), Senegal, South Africa.

6. Coordination

Working groups treating the issue of lead poisoning currently⁴⁵ exist (or have existed in the past, for example, until a legal ban was established) in 27 % of all responding countries (29 % of the Parties and 21 % of the Non-Parties); in 20 % hunters are/ were involved.

These countries are (those involving hunters in bold): Guinea-Bissau, **Mali**, South Africa, **Denmark**, **Finland**, **France**, **Portugal**, Spain, **Sweden**, **United Kingdom**, Israel, **Moldova**, **Syria**, Canada, **Iceland**, **Norway** and **the Russian Federation**.

Compared to the situation in 2000 (AEWA Range States only) these are 7 countries that have established working groups since then.⁴⁶ Thus it can be concluded that progress has been made since the last report was published.

Lead poisoning working groups to come: being established in Luxembourg; possibly in Slovakia for the transition period 2007-2014; planned in Somalia (soon).

Other existing committees/ authorities/ synergies coordinating the issue in a wider context were communicated from Tanzania and Sudan.

⁴⁵ As of mid 2007.

⁴⁶ According to the update report 2000 working groups were not established in Mali, Moldova, Norway, Sweden and Syria. For Guinea-Bissau and Portugal no information was provided, but the present information provided makes clear that working groups have been established after the year 2000.

V. Literature review

For the purpose of this literature review 49 scientific papers and approximately 20 related publications (e.g. articles, reports) have been reviewed (for exact references please see Annex 2). Building on the previous update report produced in 2000 the present literature review covers results published since 2000 only. This chapter highlights some issues that have been further studied and discussed in literature, and might have relevance for future policies. However, it does not claim to be complete.

1. Scale of the problem

Lead poisoning in waterbirds

- **Effects of the use of lead shot for hunting waterbirds in wetlands:** Since 2000 several countries have published additional relevant data of studies focusing on the prevalence of ingested and embedded lead pellets in waterbirds, and the effects especially lead ingestion⁴⁷ has on birds and their survival, leaving no doubt on the need for political/ legal measures towards a change to the use of lead-free ammunition. In most of these countries such scientific evidence has resulted in legislative measures.

However, to put it in the words of Thomas and Guitart⁴⁸, “while the distribution of waterbirds is cosmopolitan, the scientific evidence for mortality from lead ingestion comes mainly from countries with a capacity for avian pathological examination. Nonetheless, lead toxicosis is likely to occur wherever hunting [and angling] have long traditions.”

- **Effects of the use of lead shot for hunting waterbirds in upland and dryland sites /terrestrial ecosystems:** While AEWA focuses on phasing out lead shot for hunting in *wetlands*, hunting of waterbirds, especially geese, can still take place over agricultural land as well as wetlands, thus extending the distribution of lead contamination.⁴⁹ Some countries therefore - instead of banning the use of lead shot only for wetlands as agreed under AEWA - went further by banning the use of lead shot for any waterfowl, or even throughout the whole country.⁵⁰ However, at present a ban on the use of lead shot for hunting in other ecosystems than wetlands goes beyond the pertinent provision of the AEWA Action Plan and it is up to the individual countries to introduce even stricter measures than foreseen in Paragraph 4.1.4 of the AEWA Action Plan.

Other relevant issues in this context

- **Terrestrial birds:** Lead poisoning through the ingestion of lead shot also evidently affects non-waterfowl species. A recent review has confirmed that 59 different species of so-called terrestrial birds, including nine Globally Threatened or Near Threatened species, were affected by lead poisoning following the ingestion of spent shot, either by mistaking it for grit (e.g. Galliforms and Gruiforms) or – in case of raptorial species – through the consumption of lead shot or bullet fragments ingested by or embedded in their (e.g. waterbird) prey’s flesh.⁵¹ Literature therefore tends to suggest that a ban restricted to wetlands no longer seems to be justified, but should be extended to all hunting with lead and in all habitats. The latter has already been picked up by the CIC stating in its Newsletter that “the argument that lead shot is mainly a problem in the hunting of waterfowl and in the contamination of wetlands has become untenable”.⁵²

⁴⁷ Embedded pellets, according to latest studies, have no detectable chronic effect on the body condition of birds, compare e.g. Madsen and Rigét, 2007; also Merkel et al., 2006 (although less clear).

⁴⁸ Thomas and Guitart, 2005, p. 148.

⁴⁹ Compare Thomas and Guitart, 2005, p. 155.

⁵⁰ Compare results in chapter IV 2c of the present review.

⁵¹ Fisher et al., 2006; see also Pain et al., 2005; Clark and Scheuhammer, 2003.

⁵² Kanstrup and Potts, Lead Shot: New developments with relevance to all hunters, CIC Newsletter 2007/4.

- **Lead sinkers used for sport fishing:** Another issue discussed in literature, which is relevant to waterbirds, but not covered by AEWA policy yet, is the issue of the use of lead sinkers used for fishing and deposited in wetland areas. Lead poisoning in different waterbird species such as e.g. Mute Swan *Cygnus olor*, Goosander *Mergus merganser*, Mallard *Anas platyrhynchos*, Pochard *Aythya ferina*, Velvet Scoter *Melanitta fusca*, Black-crowned Night Heron *Nycticorax nycticorax* and Great Northern Diver *Gavia immer* have been associated with the ingestion of lead sinkers.⁵³ Lead fishing weights that weigh less than 50 g or are smaller than 2 cm in any dimension are generally the size that has been found to be ingested by wildlife.⁵⁴ Canadian authorities have therefore redirected their attention to lead poisoning of migratory waterbirds and work with the sport fishing industry to determine the optimum methods in order to manage the risk for wildlife.⁵⁵
- **Human consumers:** Lead is a poison for all living organisms (WHO 1989, 1995)⁵⁶ and the issue of lead poisoning through the ingestion of lead pellets by birds therefore also a potential threat to human consumers of such affected birds.

A study in Greenland⁵⁷, where lead shot is still used, revealed high concentrations of lead in meat of eiders killed with lead shot, which, in case of consumption, would largely exceed the FAO/WHO tolerable lead intake guideline⁵⁸. A clear relationship between the intake of birds hunted with lead shot and the lead concentration in human blood was found during a second study undertaken by the same research team.⁵⁹ The concentration of lead found in liver samples of eleven species of Anatidae as well as Coot *Fulica atra* and Common Snipe *Gallinago gallinago* of five different Spanish wetlands were above the EU lead threshold for poultry offal in more than 40 % of the examined cases, thus posing a health risk for regular consumers of such birds.⁶⁰ A study conducted among the Inuit population in Canada, moreover, suggests that lead shots used for game hunting is an important source of lead exposure in human consumers: A public health intervention to reduce the use of lead shot resulted in a significant decrease of blood lead concentrations in three Inuit communities.⁶¹

2. Solutions to the problem

Spent lead shot:

Remedial methods suggested or undertaken in the past such as raising water levels to reduce access to shot (and food!), ploughing, tilling or supplying grit are not considered providing effective long-term solutions to the problem.⁶² Literature, however, recommends removing the spent lead pellets from contaminated areas manually or by using mechanical methods in order to avoid that the problem remains for years, even where a ban has been established.⁶³

Alternatives to lead shot:

The literature published on this issue since 2000 continuously agrees that the only long-term solution dealing with the cause of the problem rather than with its symptoms is the introduction of a ban on lead shot going along with a

⁵³ Compare Franson et al., 2003; Scheuhammer et al., 2002; Anderson et al., 2000.

⁵⁴ Scheuhammer et al., 2002, p. 25.

⁵⁵ Personal comment (Canadian Wildlife Service).

⁵⁶ See also Guitart et al., 2002.

⁵⁷ Johansen et al., 2004.

⁵⁸ The European Commission Regulation (EC) No 466/2001 of 8 March 2001 setting maximum levels for certain contaminants [including lead] in foodstuffs sets a maximum level of 0,1 mg lead per kg meat and of 0,5 mg per kg offal of e.g. poultry. This regulation, however, does not apply to wild meat.

⁵⁹ Johansen et al., 2006.

⁶⁰ Guitart et al., 2002.

⁶¹ Lévesque et al., 2003.

⁶² Mondain-Monval and Lamarque, 2004, p. 62 ; Mondain-Monval et al., 2002 ; Mateo et al., 2000 ; Thomas et al., 2001 ; Fisher et al., 2006, p. 427.

⁶³ Guitart et al., 2002, p. 306; see also Thomas and Guitart, 2005, p. 155.

change to non-toxic alternative materials. Alternative products are being produced, mostly in countries that have already phased out lead shot, but also as export products. Studies in the U.S.A., but also e.g. in France⁶⁴ have tested substitute ammunition showing that there are several products on the market with an equivalent quality compared to lead shot. However, hunters have to find out which alternative product is best for them, and need to adapt to the new ammunition. Educational measures (theoretical as well as practical) are therefore strongly advised in order to ensure a successful transition to the use of lead-free ammunition.

The U.S. Fish and Wildlife Service (USFWS), in its national survey of fishing, hunting and wildlife-associated recreation, 2002, showed that the purchase of ammunition represents a minor part (approximately 8,5 %) of the average hunter's yearly expenditure (in the U.S.!), thus it suggests the affordability of waterfowl hunting should not be negatively affected by nontoxic shot regulations.⁶⁵

3. Effectiveness of a legal ban on the use of lead shot for hunting (in wetlands)

The effectiveness of established legal bans on the use of lead shot has been the focus of different U.S. and Canadian studies:

Studies on the impact of the lead shot ban on different duck species in the U.S.⁶⁶ have revealed a major reduction in waterfowl lead toxicosis in a short period of time following the ban on lead shot use.

A study undertaken in Canada⁶⁷ compared the accumulation of lead in waterbirds in different parts of the country prior to and after the establishment of a national regulation prohibiting the use of lead shot for waterfowl hunting. Moreover, hunters were surveyed (anonymously) in order to determine reported levels of compliance with the nontoxic shot regulation. The study showed that average lead concentrations had decreased significantly since the legal ban, and – consistent with these results – the survey indicated a high level of compliance with the legal regulation. Moreover, during a search of spent cartridges at waterfowl hunting sites all cartridges found were for steel shot and no evidence of lead shot use was found. Conversely, results for an important upland game species (American Woodcock *Scolopax minor*, for which the use of lead shot was still allowed) showed that lead concentrations in the species' bones remained unchanged as well as most hunters' habit to use lead shot for hunting this upland species. Thus the study indicated that the legal ban had led to substantial declines in the rates of lead shot ingestion in waterbirds. The survey among hunters, however, also showed that many hunters were of the opinion that nontoxic alternatives were not effective for waterfowl hunting and increased the crippling of waterbirds.

In France, the ingested lead shot prevalence rate was assessed in several species wintering in the Camargue region after a ban on lead shot and data were compared to historical data. The high prevalence of ingested lead pellets still found in waterbird species suggested that the birds were feeding outside the area, in which lead shot had been banned⁶⁸ and/or that lead pellets still remain in the area's marshes sediment. The method used in this case is suggested as being a useful tool for assessing the compliance of hunters with a legal ban.⁶⁹

The Royal Society for the Protection of Birds (UK), in 2001/2002⁷⁰, undertook a (small-scale!) survey of shot mallard purchased from game dealers in England to assess prevalence and type of shot being used and prevalence and type of ingested shot present. Analyses of pellets indicated that 68 % of the birds (27 of 40) from which pellets were retrieved had been shot with lead pellets. The conclusion of this study suggested that more consideration

⁶⁴ See Mondain-Monval and Lamarque, 2004, p. 64ff. ; Monvain-Monval, 2006, La Sauvagine.

⁶⁵ Stevenson et al., 2005, p. 412. Compare Mondain-Monval and Lamarque, 2004, p. 63 who point out that the relevance of differences in prices depends on the amount of pellets used by a hunter; a hunter using 100 pellets per year might not strongly oppose differences in prices, while for a hunter using 1,000 pellets per year the costs might be an important factor.

⁶⁶ Samual and Bowers, 2000 as well as Anderson et al., 2000.

⁶⁷ Stevenson et al., 2005.

⁶⁸ At that time the ban was not nation-wide, but only introduced for the area in question ("Tour-du-Valat").

⁶⁹ Mondain-Monval et al., 2002, p. 243.

⁷⁰ A ban on the use of lead shot for hunting in wetlands had been introduced in England in 1999.

should be given to monitoring compliance and raising the profile of the legal ban amongst the shooting community.⁷¹

The UK has recently prepared a report on the Assessment of Techniques for Monitoring Compliance with Lead Shot Regulations (England) which reviews different techniques for monitoring compliance and gives recommendations on compliance monitoring methods to be considered for use in England.⁷² This report has not been put into practice yet.

⁷¹ Compare Assessment of Techniques for Monitoring Compliance with Lead Shot Regulations (England) 1999, 2007, pp. 7f

⁷² <http://www.defra.gov.uk/wildlife-countryside/resprog/findings/lead-shot.pdf>

VI. Conclusions and Recommendations

Convention and Agreements and International Hunting Organisations addressing the lead poisoning issue: developments since 2000

On the level of international conventions and agreements the African-Eurasian Migratory Waterbird Agreement is clearly the main reference for the issue of phasing out lead shot for hunting in wetlands. Many activities with a main focus on information and theoretical as well as practical education, resulting from relevant AEWA Resolutions and International Implementation Priorities, have been realised by the AEWA Secretariat over the last years and helped to position the issue of lead shot on the political agenda of countries being Party to AEWA or in the process of doing so.

International hunting organisations such as CIC and FACE, which have already strongly supported the phasing out of lead shot in the 1990s, have meanwhile set precise targets for reaching the change to using lead-free ammunition, namely until 2009 at the latest throughout the EU (target expressed by FACE and BirdLife International in the Agreement on Directive 79/409/EEC on the Conservation of Wild Birds, 2004) and until 2010 at the latest internationally (CIC, General Assembly, Resolution on Lead Shot, 2007).

Situation in individual countries

General situation, legislation and enforcement

Hunting with lead shot, however, is still practiced in 78 % of the countries in the AEWA area, in 31 % even as a large-scale activity. Although good progress has been made since 2000 - especially within the EU, where the countries having introduced a statutory ban on hunting with lead shot meanwhile belong to the majority – there is still a long way to go until the use of lead shot for hunting in wetlands is phased out throughout the whole of the AEWA area. Clear gaps still exist in the whole of Africa and large parts of Eurasia, although the survey has shown that there is apparently certain awareness in at least 16 additional Non-EU countries (+ 4 EU countries), which have signalled that the development of relevant legislation is currently being considered. Thus the situation, although being far from ideal yet, is continuously developing in the right direction.

The AEWA Secretariat will especially assist and hopefully help accelerate these processes by making available information received from countries, which have gone through the process of phasing out lead shot already, to all other countries through its “Review on experiences made with phasing out lead shot” which is currently under preparation.

Enforcement measures are successfully implemented in the large majority of countries that have an operative ban in place. The overall impression is that the change generally goes smoothly and without major difficulties. However, it has to be taken into account that experiences have exclusively been made in EU member states and few Eurasian countries, which have already gone/ are currently going through a relatively long-lasting process of adaptation, in which hunters and the private sector are informed of and/ or prepared to the change towards lead-free ammunition.

The issue of (successful) implementation and enforcement may play a more important role for countries where the hunting of waterbirds has different socio-economic impacts or where human and financial resources for adaptive measures might be weaker than is the case in many EU member states. The level of enforcement measures required will especially depend on factors like the level of awareness and acceptance of the problem among hunters, for example, and the availability and costs of substitute materials, thus from the quality of information and education campaigns and communication processes with different stakeholders going along with the change.

Recommendations:

1. Contracting Parties should enhance their efforts to phase out the use of lead shot in wetlands in accordance with self-imposed timetables.
2. All Non-Parties should be invited to become Contracting Parties to AEWA in order to participate in and find assistance with processes such as the phasing out of lead shot.
3. All Contracting Parties should, once a legal ban on the use of lead shot is operative, establish monitoring procedures to assess compliance with the ban and its effectiveness.

Awareness and education

General awareness on the issue is still lacking in many countries - mostly in Africa and Eurasia, but also within the EU the issue is not always fully recognised and accepted as a problem that needs to be tackled, or not considered as a priority, given the fact that waterbird hunting in some countries is not a greatly popular activity. To raise awareness amongst policy and decision-makers is an absolute precondition for starting the process in each country. However, theoretical and practical education of hunters on the problem of using lead shot and alternatives to it, as well as a constructive dialogue with ammunition manufactures in order to ensure the availability of lead-free shot in each country, also play a key role in the successful implementation and enforcement of relevant legislation.

Especially information material for media or educational use is lacking in a large share of countries (73 % of the countries have informed that such material is not available and has also not been in the past), but also communication processes between authorities and hunting communities need to be enhanced and supported by strong media and/ or education campaigns. To reach hunters is extremely challenging and therefore especially important in countries where organisational structures (hunting associations or clubs) on this level are missing and where single hunters can also not be easily addressed through e.g. a monthly hunters' magazine.

Recommendations:

1. Contracting Parties and Non-Parties should share existing information material on the use of lead shot for hunting in wetlands with other countries (e.g. through the AEWA website). The latter should consult all existing international and national information material, disseminate it to all stakeholders within the respective country (e.g. policy and decision-makers, NGOs, gunting organisations), and ideally produce own more adapted information material and/ or in own language.
2. Contracting Parties should enhance communication between authorities and hunting communities in order to raise awareness on the issue of lead shot, to assess the feasibility of and steps needed for a switch to lead-free ammunition for hunting in wetlands and, most importantly, to reach agreement with the hunting community on the process towards doing so.
3. Contracting Parties, e.g. through Conservation NGOs or hunting organisations, should put emphasis on the education of hunters in theory and practice, in order to convince them about the need of using lead-free ammunition, to inform about substitute materials and provide them the practical know-how to use the lead-free shots. Especially gun proofing facilities should be available in all countries. Theoretical and practical know-how on the use of lead-free ammunition could e.g. be part of proficiency tests before obtaining a hunting license. Knowledge obtained through e.g. regional workshops such as organised in Romania, Senegal, Tunisia and Jordan, should be used and dispersed in the respective countries in order

to obtain a high level of efficiency of such workshops.

4. Hunting organisations should be invited to continuously raise awareness amongst their members about the need of a change towards lead-free ammunition for hunting in wetlands, to provide information on alternative shots and to assist members in acquiring the skills necessary to use these alternatives.
5. Ammunition manufacturers should be encouraged to actively promote the use of lead-free ammunition for hunting in wetlands and to provide the appropriate information on its use.
6. The AEWA Secretariat, funds permitting, should continue to disseminate knowledge and expertise at the international level by making information materials available and organising further workshops in different regions.

Research and development (including the Literature review)

Since 2000 numerous studies and relevant papers have been published in different countries, including such where a ban has not been introduced yet, and adding evidence to already existing published studies on lead poisoning in waterbirds caused by the ingestion of lead shot. The discussion has been broadened since recent papers have confirmed that the problem of lead poisoning is not (and should not) be reduced to waterbirds and wetlands, but also affects other ecosystems and bird species dependent on them. From an AEWA point of view this might be of relevance for waterbird species (also) dependent on ecosystems other than wetlands, such as e.g. agricultural fields. Published cases of poisoned waterbirds after ingestion of lead sinkers might have to be considered in the framework of AEWA along with the work done in case of lead shot. Recent studies have moreover concentrated on the effect of lead poisoning of birds on human consumers, especially in regions in which the amount of game birds consumed by humans is traditionally high, showing that the issue is not only relevant from a conservational point of view, but – in certain areas/ communities - also possibly affecting public health. First studies have, moreover, focused on the compliance of hunters with a ban on the use of lead shot suggesting methods which might be useful to be considered by countries which are still in the phase of implementation and not concerned with the compliance by hunters yet.

Apparently 17 % of the countries have been active in stimulating or facilitating the manufacture and availability of lead-free ammunition in their territory as required by Resolution 2.2 (more than half of them being countries that have introduced a legal ban).

Recommendations:

1. The Technical Committee should give advice on the relevance of the use of lead shot in terrestrial ecosystems for species covered by AEWA and provide its recommendations on this issue.
2. The Technical Committee should give advice on the relevance of the use of lead sinkers for fishing for species covered by AEWA and provide its recommendations on this issue.
3. Parties should be urged to stimulate and facilitate the production and availability of alternatives to lead shot in their country.
4. The Secretariat should make available a list of relevant publications and links through its website.
5. Ammunition manufacturers should be encouraged to develop and make available alternative ammunition throughout the AEWA area.

Annexes

Annex 1: Status in individual countries overview (sorted by category in the year 2007)

	Hunting with lead shot occurring	Large-scale activity	Legal ban: all wetlands	Legal ban: part of wetlands	Voluntary approach	Criteria of legal ban/ Definition of wetlands	Legislation considered	General awareness	CEPA	Research	Development of lead-free materials	WGs	2007	2000	1997
Africa															
Parties															
Benin	√				√								C/D ⁷³		
Guinea-Bissau	√				√	IBAS; areas with low concentration of birds/ low feeding opportunities; Resting and reproduction areas.		√	√		√	√	C		
South Africa	√				√ ⁷⁴	Vleis, pans, inland lakes, peats, sponge areas, water catchment areas.		√	√			√	C	B (D)	
Sudan	√				√		√	√	√		√		C/D ⁷⁵		
Congo (Rep)	√												D	D	
Guinea	√												D		
Kenya	√						√	√	√				D	D	
Mali	√					Natural or artificial areas, managed or wild, which are temporary or permanently watered.	√	√	√		√	√	D	F	
Tanzania	√												D		
Togo	√						√						D	N	
Tunisia	√												D		
Algeria	√	√					√	√		√			E	N	
Senegal								√	√				E/F ⁷⁶		
Ghana	√	√							√				F	B	
Nigeria	√	√							√				F		
Libyan Arab Jamahiriya	√						√		√				N		
Non-Parties															
Comoros	√												D		
Ethiopia	√							√			√		D		
Morocco ⁷⁷	√					Hunting is strictly							D	D	

⁷³ In the South of Benin some emigrated hunters use lead-free ammunition on a voluntary basis, but obviously this is not governmental-driven.

⁷⁴ In South Africa the national hunting associations “Wingshooters” has made the use of lead-free ammunition part of the Code of Conduct of its members.

⁷⁵ Some people use lead-free ammunition on a voluntary basis, but obviously this is not governmental-driven.

⁷⁶ There is an awareness, but legislation is not being considered for the time being and no information was provided whether hunting with lead shot represents a large-scale activity or not.

Update report on the use of non-toxic shot for hunting in wetlands

						prohibited in the majority of wetlands, namely those classified biological reserves and certain Ramsar sites.										
Burkina Faso	No information						√						E			
Somalia	√	√				Rivers, woodlands and coastlines and their inhabitants.	√						E			
Burundi													N			
Chad						Protected areas.	√	√	√	√			N			
Côte d'Ivoire							√		√				N ⁷⁸			
	Hunting with lead shot occurring	Large-scale activity	Legal ban: all wetlands	Legal ban: part of wetlands	Voluntary approach	Criteria of legal ban/ Definition of wetlands	Legislation considered	General awareness	CEPA	Research	Development of lead-free materials	WGs	2007	2000	1997	
European Union																
Parties																
Belgium	√		√		√	Flemish region: Ramsar-wetlands, SPAs (Bird Directive), marshes, pools, peat-areas, water-areas of at least 3 ha; ⁷⁹ Walloon region: less than 50 meters from a marsh, a lake, a pond, water reservoirs, a river or a canal. The use of coated lead pellets ("cartouches à plomb nickelés"), however remains allowed.		√	√				A	B		
Czech Republic	√	√	√			Waterfowl		√	√	√	√		A ⁸⁰	E		
Denmark			√			Any use, possession and trade with lead shot is prohibited throughout the whole territory.		√	√	√	√	√	A	A		
Finland			√			Bogs, mires, lakes, ponds, coastal and lake meadows and other watered areas		Ban accepted	Done in the past	√		√	A	A		

⁷⁷ Signatory.

⁷⁸ A total ban on hunting is effective since 1974.

⁷⁹ A total ban will be effective in the Flemish region from 1 July 2008 on.

⁸⁰ The statutory ban in the Czech Republic will be effective from 2010 on.

Update report on the use of non-toxic shot for hunting in wetlands

					(annual/permanent/seasonal).										
France			√		The sea in the limits of territorial waters and the public maritime area ; marches which are not dry, rivers, streams, channels, reservoirs, lakes, surfaces of fresh/ salt or brackish water, an area of 30 m around rivers, streams, channels, reservoirs, lakes, surfaces of fresh/ salt or brackish water.		Authorities are aware; Lack of acceptance by hunters	√	√	√	√	A	E		
The Netherlands			√		Total ban		Ban accepted	Done in the past				A	A		
Slovakia	√		√		Ban on lead shot refers to wetlands and waterbirds: Wetlands: territory with swamps, low bogs or peat bogs, wet meadows, natural flowing water and natural stagnant water including a water-stream and water area with ponds and water reservoirs waterbird game species: mallard, greylag goose, bean goose, white fronted goose and coot.		√					A ⁸¹	D		
Spain	√	√	√		Ramsar sites and natural protected areas.		√	√	√	√	√	A	B		
Sweden			√		Area covered by vegetation where the water surface is just below, equal or just over ground level and where water level follows natural seasonal variations. ⁸²		√	√	√	√	√	A	B ⁸³		
Hungary	√			√	The regulation lists 33 wetland areas, among them		√	√	√			B	F		

⁸¹ The statutory ban in Slovakia will be effective from 2015 on.

⁸² Definition as given in the Lead shot review of the European Commission.

⁸³ Sweden was rated "B" (partial statutory ban) in the update review 2000 for the reason that the ban on lead shot applied to all ducks and geese, but formally hunting of coot and common snipe (and woodcock) were still allowed. According to the information received through the recent survey the ban on the use of lead shot, valid since 1994, is not limited to species, but refers to specific areas/ habitat types.

Update report on the use of non-toxic shot for hunting in wetlands

						all Ramsar areas, being important bird habitats. Moreover the responsible authorities prohibit the use of lead shot in a case- by- case resolution on the certain fishpond or wetland being continuously under water where waterbirds occur regularly. Around all areas, if reasoned, a 100 m buffer zone can be designated as a maximum. The hunting with lead shot on the border of such areas can be pursued only in a way that the lead drops do not fall on the area in question.									
Latvia	√			√		Ban limited to protected areas (Ramsar sites and nature reserves).			√		√			B	B
Germany	√		√ ⁸⁴		√	Running and stagnant water; wet meadows, fenlands and marshes. ⁸⁵	√	√	√	√	√			B/C	C
UK	√	√	√ ⁸⁶		√ ⁸⁷	England and Wales: on or over any area below high-water mark of ordinary spring tides and on or over any site of special scientific interest listed in the pertinent regulation. Also prohibited: the use of lead shot for shooting coot, all species of ducks and geese and the moorhen. Scotland: Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or	√	√	√	√	√	√		B/C	B

⁸⁴ In Germany, similar to other countries like e.g. Norway and the UK, the problem has first been approached on a voluntary basis with a bilateral agreement between the Federal Ministry of Food, Agriculture and Consumer Protection and the national hunting association “Deutscher Jagdschutz-Verband e.V.” in 1993. Based on this, regional associations have recommended the use of lead-free shot for hunting in wetlands. A statutory ban is meanwhile in place in 11 of 16 federal states. However, plans to introduce a legal ban exist in all missing federal states except of Hamburg and Bremen (city states).

⁸⁵ Example: Saarland.

Update report on the use of non-toxic shot for hunting in wetlands

						flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters (Ramsar definition).									
Lithuania	√							√	√				D	D	
Luxembourg	√					In and around less than 30 m of marshes, lakes, rivers and channels.	√	√	√				D ⁸⁸	D	
Portugal	√						√	√	√	√		√	D		D
Italy	√	√					√ ⁸⁹			√			E	F	
Bulgaria		√					√ ⁹⁰						E		
Romania	√	√								√			F	D	
Non-Parties															
Cyprus	√		√			In and in a radius of 300 meters around any wetlands.	√			√			A	B	
Estonia	√							√		√			D		F
	Hunting with lead shot occurring	Large-scale activity	Legal ban: all wetlands	Legal ban: part of wetlands	Voluntary approach	Criteria of legal ban/ Definition of wetlands	Legislation considered	General awareness	CEPA	Research	Development of lead-free materials	WGs	2007	2000	1997
Eurasia (outside EU)															
Parties															
Switzerland			√			Wetlands and zones with shallow water.		√	√				A	A	
Israel	√						√ ⁹¹		√	√		√	D	B	
Syrian Arab Republic	√						√		√			√	D/N ⁹²		
Albania	√	√					√		√				E	F	
Jordan	√	√					√		√				E		
Moldova (Republic of)	√	√					√	√	√	√		√	E	F	
Croatia	√	√						√	√				F	F	

⁸⁶ In England, Scotland and Wales a statutory ban on hunting with lead shot in wetlands is in place. In Northern Ireland, there is a voluntary ban, but a statutory ban is proposed for 2008/ 2009.

⁸⁷ In Northern Ireland.

⁸⁸ In Luxembourg legislation is under preparation.

⁸⁹ In Italy a national law to ban/regulate the use of lead shots in the wetlands inside the SPAs is under discussion. Similar laws are already in preparation in most Regions.

⁹⁰ Legislation is currently under preparation.

⁹¹ In Israel there are plans to prohibit the use of lead shot by September 2008. Legislative measures have already been initiated.

⁹² In the Syrian Arab Republic a ban on hunting was effective till October 2007; new hunting legislation is being developed, which is expected to contain some articles related to the ban on the use of lead shot.

Annex 2: Literature since 2000

1. Scientific papers and articles (in English or French)

Lead exposure in (water)birds:

- Bana, Giovanni, Ecological effects of lead-shot on terrestrial habitats and on the accumulation of lead in wild birds other than waterfowl, 2004.⁹⁵
- Butler, David A.; Sage, Rufus B.; Draycott, Roger A.H.; Carroll, John P.; Potts, Dick, 2005, Lead exposure in Ring-necked Pheasants on shooting estates in Great Britain, *Wildlife Society Bulletin* 33 (2), pp. 583-589.
- De Besombes A., 2006, Saturnisme des anatidés et passage aux munitions non toxiques : incidence de la grenaille d'acier sur la qualité de la viande de gibier, Thèse vétérinaire, ENV Toulouse.
- Burger, Joanna; Gochfeld, Michael, 2000, Effects of lead on birds (*Laridae*): a review of laboratory and field studies, *Journal of Toxicology and Environmental Health, Part B Critical Reviews*, 3 (2), pp. 59-78.
- Clark, A.J.; Scheuhammer, Anton M., 2003, Lead poisoning in upland-foraging birds of prey in Canada, *Ecotoxicology* 12, pp. 12-30.
- Falk, Knud; Merkel, Flemming; Kampp, Kaj; Jamieson, Sarah E., 2006, Embedded lead shot and infliction rates in common eiders *Somateria mollissima* and kind eiders *S. spectabilis* wintering in southwest Greenland, *Wildlife Biology*, 12, pp. 257-265.
- Figuerola, Jordi; Mateo, Rafael; Green, Andy J.; Mondain-Monval, Jean-Yves; Lefranc, Hughes; Mentaberre, Gregorio, 2005, Grit selection in waterfowl and how it determines exposure to ingested lead shot in Mediterranean wetlands, *Environment Conservation*, 32 (3), pp. 226-234.
- Fisher, Ian J.; Pain, Deborah J.; Thomas, Vernon G., 2006, A review of lead poisoning from ammunition sources in terrestrial birds, *Biological Conservation* 131, pp. 421-432.
- Goutner, Vassilis; Papagiannis, Ioannis; Kalfakakou, Vassiliki, 2001, Lead and cadmium in eggs of colonially nesting waterbirds of different position in the food chain of Greek wetlands of international importance, *The Science of the Total Environment*, 267, pp. 169-176.
- Hicklin, Peter W.; Barrow, W.R., 2004, The incidence of embedded shot in waterfowl in Atlantic Canada and Hudson Strait, *Waterbirds*, 27 (1), pp. 41-45.
- Guillemain, M.; Devineau, O.; Lebreton, J.-D. ; Mondain-Monval, J.-Y. ; Johnson, A.-R. ; Simon, G., 2007, Lead shot and teal (*Anas crecca*) in the Camargue, Southern France: Effects of embedded and ingested pellets on survival, *Biological Conservation* 137 (2007) pp. 567-576.
- Madsen, Jesper; Rigét, Frank, 2007, Do embedded shotgun pellets have a chronic effect on body condition of Pink-footed Gese?, *Journal of Wildlife Management* 71(5), pp. 1427-1430.
- Mateo, Rafael; Guitart, R.; Green, A.J., 2000, Determinants of lead shot, rice, and grit ingestion in ducks and coots, *Journal of Wildlife Management*, 64, pp. 939-347.
- Mateo, Rafael; Green, Andy J.; Jeske, Clinton W.; Urios, Vincente; Gerique, Cati, 2001, Lead poisoning in the globally threatened Marbled Teal and White-headed Duck in Spain, *Environmental Toxicology and Chemistry*, Vol. 20, No. 12, pp. 2860-2868.
- Mateo, Rafael; Green, A.J.; Lefranc, H.; Baos, R.; Figuerola, J., 2007, Lead poisoning in wild birds from southern Spain: A comparative study of wetland areas and species affected, and trends over time, *Ecotoxicology and Environmental Safety*, 66 (1), pp. 119-126.
- McCracken, K.G.; Afton, A.D., Peters, M., 2000, Conditions bias of hunter-shot ring-necked duck exposed to lead, *Journal of Wildlife Management*, 64, pp. 585-590.
- Merkel, Flemming R; Falk, Knud; Jamieson, Sarah E., 2006, Effect of embedded lead shot on body condition of Common Eiders, *The Journal of Wildlife Management*, 70 (6), pp. 1644-1649.
- Mondain-Monval, J.Y.; Desnouhes, L.; Taris, J.P., 2002, Lead shot ingestion in waterbirds in the Camargue, France, *Game and Wildlife Science*, 19, pp. 237-246.

⁹⁵ Information document at the 24th meeting of the Standing Committee of the , Strasbourg, 29 November – 3 December 2004.

- Noer, Henning; Madsen, Jesper; Hartmann, Poul, Reducing wounding of game by shotgun hunting: effects of a Danish action plan on pink-footed geese, Denmark 2007, *Journal of Applied Ecology* 44, 653-662.
- Pain, D.J.; Meharg, A.A.; Ferrer, M.; Taggart, M.; Penteriani, V., 2005, Lead concentrations in bones and feathers of the globally threatened Spanish imperial eagle, *Biological Conservation*, 121, pp. 603-610.
- Perrins, C.M., Cousquer, G. and Waive, J., 2003, A survey of blood lead levels in Mute Swans *Cygnus olor*, *Avian Pathology*, 32, pp. 205-212.
- Scheuhammer, Anton M.; Bond, Della E.; Burgess, Neil M.; Rodrigues, Jean, 2003, Lead and stable lead isotope ratios in soil, earthworms, and bones of American Woodcock (*Scolopax minor*) from Eastern Canada, *Environmental Toxicology and Chemistry*, 22 (11), pp. 2585-2591.
- Strom, S.M.; Patnode, K.A.; Langenbert, J.A.; Bodenstein, B.L.; Scheuhammer, A.M., 2005, Lead contamination in American Woodcock (*Scolopax minor*) from Wisconsin, *Environmental Contamination and Toxicology*, 49 (3), pp. 396-402.
- Tavecchia, Giacomo; Pradel, Roger; Lebreton, Jean-Dominique; Johnson, Alan R.; Mondain-Monval, Jean-Yves, 2001, The effect of lead exposure on survival of adult mallards in the Camargue, southern France, *Journal of Applied Ecology*, 38, pp. 1197-1207.

Solutions to the problem (general considerations, tests of substitute materials etc.):

- Brewer, L.; Fairbrother, A.; Clark, J.; Amick, D., 2003, Acute toxicity of lead, steel, and an iron-tungsten-nickel shot to mallard ducks (*Anas platyrhynchos*), *Journal of Wildlife Diseases*, 39(3), pp. 638-648.
- Fisher, Ian J.; Pain, Deborah J.; Thomas, Vernon G., 2006, A review of lead poisoning from ammunition sources in terrestrial birds, *Biological Conservation*, 131, pp. 421-432.
- Kanstrup, Niels, 2006, Non-toxic shot – Danish experiences, *Waterbirds around the world*, p. 861.
- Kanstrup, Niels and Potts, Dick, Lead Shot: New developments with relevance to all hunters, *CIC Newsletter 2007/4*, pp. 1, 4-5.
- Mondain-Monval J-Y. ; Lamarque F., 2004, Saturnisme des Anatidés: une bonne raison pour passer aux munitions sans plomb? *Faune Sauvage* n° 261. pp. 59-68.
- Mondain-Monval, J.Y., Didier, S., Malagutti, A.; Noble P.; Sonier, J.P., Dossier, 2006, Munitions alternatives : trouver ses marques. *La Sauvagine* n° 514. pp.18-25.
- Olivier, Guy-Noël, 2006, Considerations on the use of lead shot over wetlands, *Waterbirds around the world*, pp. 866-867.
- Olivier, Guy-Noël, 2006, Témoignage d'un sauvaginer passionné, *La Sauvagine* février 2006, pp. 26-28.
- Thomas, V.G.; Guitart, R., Role of international conventions in promoting avian conservation through reduced lead toxicosis: progression towards a non-toxic agenda, *Bird Conservation International*, 15 (2005-06) Nr. 2, pp. 147-160.
- Lenten, Bert, Response of the UNEP/AEWA Secretariat to “Role of international conventions in promoting avian conservation through reduced lead toxicosis: progression towards a non-toxic agenda, *Bird Conservation International*, 15 (2005-06) Nr. 2, pp. 161-163.
- Thomas, V.G. and Guitart, R. 2003, Evaluating non-toxic substitutes for lead shot and fishing weights. Criteria and regulations, *Environ. Policy Law* 33, pp. 150-154.
- U.S. Fish and Wildlife Service (USFWS) 2002, national survey of fishing, hunting and wildlife-associated recreation.

Effects of lead shot on consumers:

- Guitart, Raimon; Serratos, Jordi; Thomas, Vernon G., 2002, Lead poisoned wildfowl in Spain: a significant threat for human consumers, *International Journal of Environmental Health Research*, 12, pp. 301-309.
- Johansen, Poul; Asmund, Gert; Riget, Frank, 2004, High human exposure to lead through consumption of birds hunted with lead shot, *Environmental Pollution*, 127, pp. 125-129.

- Johansen, Poul; Pederson, Henning Sloth; Asmund, Gert; Riget, Frank, 2006, Lead shot from hunting as a source of lead in human blood, *Environmental Pollution*, 142, pp. 93-97.
- Lévesque, B.; Duchesne, JF; Gariépy, C.; Rhains, M. ; Dumas, P. ; Scheuhammer, A.M. ; Proulx, F-F ; Déry, S.; Muckle, G.; Dallaire, F.; Dewailly, É., 2003, Monitoring of umbilical cord blood lead levels and sources assessment among the Inuit, *Occupational and Environmental Medicine*, 60, pp. 693-695.

Effectiveness of a legal ban on the use of lead shot for hunting (in wetlands) and compliance of hunters:

- Anderson, William L.; Havera, Stephen P.; Zercher, Bradley W., 2000, Ingestion of lead and nontoxic shotgun pellets by ducks in the Mississippi flyway, *Journal of Wildlife Management*, 64, pp. 848-857.
- Samuel, Michael D. and Bowers, Frank, 2000, Lead exposure in American black ducks after implementation of non-toxic shot, *Journal of Wildlife Management*, 64, pp. 947-953.
- Stevenson, A.L.; Scheuhammer, A.M.; Chan, H.M., 2005, Effects of Nontoxic Shot Regulations on Lead Accumulation in Ducks and American Woodcock in Canada, *Environmental Contamination and Toxicology*, 48 (3), pp. 405-413.

Effects of fishing sinkers on waterbirds:

- Franson, J. Christian; Hansen, Scott P.; Creekmore, Terry E.; Brand, Christopher J.; Evers, David C.; Duerr, Adam E.; DeStephano, Stephen, 2003, Lead Fishing Weights and other Fishing tackle in selected waterbirds, *Waterbirds* 26 (3), pp. 345-352.
- Scheuhammer, A.M., Money, S.L., Kirk, D.A.; Donaldson, G., 2002, Lead fishing sinkers and jigs in Canada: a review of their use patterns and toxic impacts on wildlife, Ottawa, Canada, Occasional paper No. 108, Canadian Wildlife Service, Environment Canada.
- Thomas, V.G., 2003, Harmonizing approval of nontoxic shot and sinkers in North America, *Wildlife Society Bulletin*, 31, pp. 292-295.
- Thomas, V.G. and Guitart, R., 2003, Lead pollution from shooting and angling, and a common regulative approach, *Environmental Policy Law*, 33, pp. 143-149.

Scientific papers and articles (in other languages):

In Czech (titles have been translated into English):

- Zizka M., 2007, Hunting of ducks with non-toxic shot only in four years time. *World of hunting* 8 (2), p. 11.
- Havranek F., Rehak L., 2007, Why will we not use lead shot for hunting of waterfowl from 2011 on? *World of hunting* 8 (2), pp. 12 – 13.
- Badalik V., 2007, Notes to the introduction of lead-free shot, *World of hunting* 8 (2), pp. 14 – 16.
- Vaca D., 2007, „Sellier & Bellot“ is prepared to producing and selling lead-free shot on the Czech market, *World of hunting* 8 (2), p. 17.

In Danish:

- Noer, H., Hartmann, P.; Madsen, J., 2006, Anskydning af vildt. Konklusioner på undersøgelser 1997-2005. Danmarks Miljøundersøgelser. - Faglig rapport fra DMU 569: 96 s.
English title: Crippling of game. Conclusions from investigations 1997-2005:
http://www2.dmu.dk/1_viden/2_Publikationer/3_fagrappporter/rappporter/FR569.PDF
- Blykontaminering af grønlandske fugle
Faglig rapport fra DMU nr. 299
English title: Lead contamination of Greenlandic birds:
http://www2.dmu.dk/1_viden/2_Publikationer/3_fagrappporter/rappporter/FR299.pdf

- Blykontaminering af havfugle i Grønland fra jagt med blyhagl.
Faglig rapport fra DMU nr. 408
English title: Lead contamination of seabirds in Greenland from hunting with lead shot:
http://www.dmu.dk/1_viden/2_Publikationer/3_fagrappporter/rapporter/FR408.pdf
- Bly i blod fra mennesker i Nuuk, Grønland - en vurdering af blyhagl far fugle som forureningskilde.
Faglig rapport fra DMN nr. 510
English title: Lead in blood from peoples in Nuuk, Greenland - an evaluation of leadshot from birds as source of pollution: http://www2.dmu.dk/1_viden/2_publicationer/3_fagrappporter/rapporter/FR510.pdf
- Grønlandsk kost - en miljømedicinsk vurdering, 2000 (report with an "environmental-medical" evaluation on Traditional Greenlandic Food including an evaluation of the effects of lead):
[http://www.nanoq.gl/Groenlands_Landsstyre/Direktoratet_for_Kultur_Uddannelse/Forskning/Inussuk - Arktisk Forskningsjournal/2000-2.aspx](http://www.nanoq.gl/Groenlands_Landsstyre/Direktoratet_for_Kultur_Uddannelse/Forskning/Inussuk_-_Arktisk_Forskningsjournal/2000-2.aspx)
- Hartmann, P., Kanstrup, N., Asferg, T. & Fredshavn, J.R., 1999, Kvalitetsparametre for haglammunition. En undersøgelse af spredning og indtrængningsevne som funktion af haglenes størrelse og form. Danmarks Miljøundersøgelser. - Faglig rapport fra DMU 295: 36 s. [in Danish: two page english summary:
English title: Quality parameters for shotgun ammunition. An investigation of dispersal and penetration in relation to pellet size and shape:
http://www2.dmu.dk/1_viden/2_Publikationer/3_fagrappporter/rapporter/fr295.pdf
- Noer, H., Madsen, J., Strandgaard, H. & Hartmann, P., 1996, Anskydning af vildt. Danmarks Miljøundersøgelser. - TEMA-rapport fra DMU 1996/8: 52 s.
English title: Crippling of game:
http://www2.dmu.dk/1_viden/2_Publikationer/3_temarappporter/rapporter/87-7772-286-8.pdf

In German:

- Kinsky, Helmut, Jagen an Gewässern ohne Blei – Alternativen mit Abstrichen, Jungjägerinfo, pp. 24-30.

In Hungarian:

- Csányi Sándor: Az ólomsörét használatának veszélyei vizes élőhelyeken. In: Nimród: vadászújság, ISSN 0549-494X, 2005. (93. évf.), 9. sz., 24-25. p.

In Portuguese:

- Rodrigues, D.J.C. 1998. Dieta Estival e Risco de Saturnismo do Pato-real (*Anas platyrhynchos*) nos arrozais da Quinta do Canal. Airo 9: 33-40.
- Rodrigues, D.J.C., Figueiredo, M.E.M.A. & Fabião, A.M.D. 2001. Mallard Lead Poisoning Risk in Central Portugal. Wildfowl 52: 169-174.
- Rodrigues, D. & Fabião, A. 2001. O Saturnismo nas aves aquáticas. Qual é a real gravidade da situação em Portugal? Calibre12 113: 17-22.
- Rodrigues, D., Figueiredo, M. & Fabião, A. 2003. Calendário venatório para aquáticas. Porque é que se deve cumpri-lo? Calibre12 143: 18-22.

In Swedish:

- Konsekvenser av förbud mot bly i ammunition, - ett regeringsuppdrag rapporterat av Naturvårdsverket och Kemikalieinspektionen, 2006, Rapport 5627.
- Underlagsrapporter till regeringsuppdraget om bly i ammunition, Naturvårdsverket, 2006, Rapport 5624.

In Russian:

- Zatulovsky, S. S., L. A. Mudruk & O. F. Golovach. Ecologically clean steel shot for hunting and sports shooting. Metals and Foundry of Ukraine. – 1996, No. 7–8. – Pp. 39–42.
- Еськов Е.К., Кирьякулов В.М. 2007. Экологические последствия загрязнения свинцовой дробью водно-болотных угодий Московской области // Современные проблемы природопользования, охотоведения и звероводства. Киров: 139-140.

- Лебедева Н.В., Сорокина Т.В. 2004. Тяжелые металлы в водоплавающих и околоводных птицах бассейна Азовского моря // Пищевые ресурсы дикой природы и экологическая безопасность населения. Киров: 137-139.
- Сергеев А.А., Шулятьева Н.А. 2004. Качество мяса пернатой дичи в связи с применением свинцовой дроби // Пищевые ресурсы дикой природы и экологическая безопасность населения. Киров: 174-176.

In Ukraine (titles have been translated into English):

- Golovach, O. F. A problem of lead poisoning of aquatic and hunting birds in Ukraine and the way of its solving. In: Current state and Prospective of development of natural and geographical sciences and education. Collected scientific articles of the National Pedagogical University. – 2000. – Pp. 51–54.
- Golovach O. Ecological ricochet. Ecological Magazine of Ukraine, Zeleny Svit, 1994. – No. 6 (70).
- Golovach O. For ducks. Forestry and Hunting Journal, 1996. – No. 2.
- Golovach, O. F., A. Yu. Veremeyenko, G. V. Kosyakova & S. V. Nikitina. To a problem on environmental contamination by lead in Ukraine. In: Effect of motor transport on air pollution. – Kyiv, 2001. – Pp. 42–46.

2. Other relevant publications (e.g. newsletters, reports, practical guides)

In English or French:

AEWA Secretariat:

- Special edition of the AEWA Newsletter: The use of non-toxic shot for hunting waterbirds in wetlands, 2002 (English, French and Russian versions available).
- AEWA, Technical Series No. 3: Non-toxic shot - A path towards sustainable use of the waterbird resource (English and French versions available).
- Beintema, Nienke, Planting seeds of awareness.
- Beintema, Nienke, Steel shot – some technical and safety aspects.
- Beintema Nienke, Non-toxic shot is gaining territory.

All publications can be downloaded at <http://www.unep-aewa.org/publications/index.htm> or ordered as free hardcopy from the AEWA Secretariat at aewa@unep.de

Building capacity for sustainable hunting of migratory birds in Mediterranean countries of North Africa and Middle East project:

- Guidelines for Sustainable Hunting of Migratory Birds in Mediterranean Third Countries developed under the project “Building capacity for sustainable hunting of migratory birds in Mediterranean countries of North Africa and Middle East”, executed by BirdLife Middle East in partnership with SPNL in Lebanon.
- Code of Practice for Responsible hunting of Migratory birds developed under the project “Building capacity for sustainable hunting of migratory birds in Mediterranean countries of North Africa and Middle East”, executed by BirdLife Middle East in partnership with SPNL in Lebanon.

France:

- Baron, P, Suppression de l'utilisation de la grenaille de plomb de chasse dans les zones humides exposant les oiseaux d'eau au saturnisme. Rapport présenté au nom du groupe de travail. Inspection Générale de l'Environnement, Ministère de l'Aménagement du territoire et de l'Environnement, France 2001: <http://www.ecologie.gouv.fr/IMG/pdf/0405-saturnisme-rapport.pdf>
- ONCFS, Les cartouches sans plombs - Guide de l'armurier, France 2004: http://www.oncfs.gouv.fr/doc/cartouches/Armurier_ONCFS.pdf
- RNC., Billes d'acier: Elles ont tout pour plaire. Revue nationale de la chasse juillet 2006. pp. 24-38, France 2006.

UK :

- Protecting Waterfowl from Lead in Wetlands – A Practical Guide to the Lead Shot Regulations in Scotland, UK: http://www.basc.org.uk/media/protecting_waterfowl.pdf or http://www.unep-aewa.org/surveys/hunting_and_trade/brochure_on_lead_shot_scotland.pdf
- Code of practice on the licensed shooting of Brent geese: http://www.defra.gov.uk/corporate/regulat/forms/cons_man/vertpest/WCA25.pdf
- Code of good practice in conjunction with the main shooting organisations: <http://www.basc.org.uk/content/codeofgoodshootingpractic>
- Assessment of Techniques for Monitoring Compliance with Lead Shot Regulations (England) 1999, Final Report, prepared by ADAS UK Ltd for Defra Wildlife Species Conservation Division, March 2007: <http://www.defra.gov.uk/wildlife-countryside/resprog/findings/lead-shot.pdf>

USA:

- Report of the Nontoxic Shot Advisory Committee, submitted to the Minnesota Department of Natural Resources, Fish and Wildlife Division, 2006.

South Africa:

- Code of Conduct for waterfowl hunting, Southern African Wingshooters Association:
<http://www.wingshooters.co.za/pdf/ethics/CodeEthics-Waterfowling.pdf>

Spain:

- Rodrigues, D., Figueiredo, M., Oliveira, D., Fabião, A., Vaz, M.C., Sarmento, G., França, J. & Bacelar, J., 2005, Lead Poisoning in Portuguese Waterfowl. Páginas 170-171 in K. Pohlmeier (Ed.) 27th Congress of the International Union of Game Biologists – IUGB. DSV-Verlag, Hamburg.

In other languages (not official languages of AEWA):

In Croatian:

- Vranjkovic, A., 2005, Olovna sacma na jelovniku. Dobra kob 10: 27.

In Hungarian:

- Az ólomsörétek korlátozása. - In: Madártávlat, ISSN 1217-7156 , 2005. (12. évf.), 4. sz., 22. p.
Csányi Sándor: Az ólomsörét használatának veszélyei vizes élőhelyeken . - In: Nimród: vadászújság, ISSN 0549-494X , 2005. (93. évf.), 9. sz., 24-25. p., Hungary.
- Fácányi Zsombor: Ólomsörét . - In: Nimród: vadászújság, ISSN 0549-494X , 2004. (92. évf.), 8. sz., 23. p., Hungary.

In Icelandic (titles have been translated):

- Einarsson et al. 2000, Lead shot and environmental protection.
- Skotvís 6 (1): 61-63; Haraldsson et al. 2001, More on lead and the use of lead shots.
- Skotvís 7(1): 24-28; Guðmann 2004, The hunter's guide.
- Umhverfisstofnun 2004, pp. 45.

In Czech:

- Booklet "Non-toxic shot in theory and practice", released by Ministry of Agriculture (2006).

Relevant website links:

Conventions and Agreements:

- AEWA: <http://www.aewa-unep.org>
- Bern Convention:
<http://conventions.coe.int/Treaty/Commun/QueVoulezVous.asp?NT=104&CM=8&DF=1/22/2008&CL=ENG>
- CBD: <http://www.cbd.int/>
- CMS: <http://www.cms.int>
- European Commission/ Nature and Biodiversity: http://ec.europa.eu/environment/nature/index_en.htm
- Ramsar Convention: <http://www.ramsar.org/>

International hunting organisations:

- CIC website: <http://www.cic-wildlife.org/>
- FACE website: <http://www.face-europe.org/>