

# Non-toxic Shot

A path towards sustainable use  
of the waterbird resource



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# 1. Non-toxic shot: a necessity

## ***Introduction***

Why switch from lead shot to non-toxic shot? Why give up a traditionally used, well-known, cheap and high quality shot type in favour of anything else? Why go through all the trouble of educating and/ or raising awareness amongst hunters, producing new shot types, and changing legislation all over the world? These questions are straightforward and understandable. And so is their answer: a switch to non-toxic shot is necessary to preserve waterbirds and their habitats for the future. Not only for nature conservationists, but naturally also for hunters themselves. In our modern world, where there is a constant competition between environmental and human demands, there is no other solution than to use natural resources sustainably. In the light of this, there is no other way than to abandon the use of lead shot when hunting waterbirds in wetlands.



Waterbirds are a group of the world's most remarkable and impressive creatures. For many millennia they have been the travellers of the globe, flying thousands of kilometres every year from their breeding areas to wintering grounds and back. Some breed in the high Arctic and winter close to the equator. Some fly all the way across Africa in pursuit of the most favourable conditions. Some lose up to a third of their body weight during migration, and many never return. It is this travelling lifestyle itself that makes waterbirds extremely vulnerable.

During their entire lives, in all those places along their journey, waterbirds depend on wetlands in order to breed and to winter, but also just to rest and gather energy for the next part of their migration. Those wetlands need to be unspoiled and clean. Just as waterbirds depend on that for their survival, hunters depend on it to safeguard their passion. That's why it is so important that hunting activities do not lead to pollution of the wetland environment. If ingested by waterbirds lead shot pellets, however, are highly poisonous for them, showing a stubborn persistence in the environment.

It is estimated that lead shot pellets kill many millions of waterbirds worldwide each year. This mortality from lead shot ingestion becomes apparent either as large-scale die-offs or as less conspicuous, day-to-day mortality. Many instances of die-offs have been recorded in the United States and Canada. Although spectacular cases of mortality have drawn public attention to the issue of lead poisoning, these occasions are probably less important than the largely invisible losses of small numbers of birds on a daily basis. Sick and dying birds generally become increasingly reclusive. After death, carcasses are not likely to be seen, even by trained observers. Dead birds are not often noticed unless the mortality rate surpasses the ability of predators and scavengers to remove them efficiently.

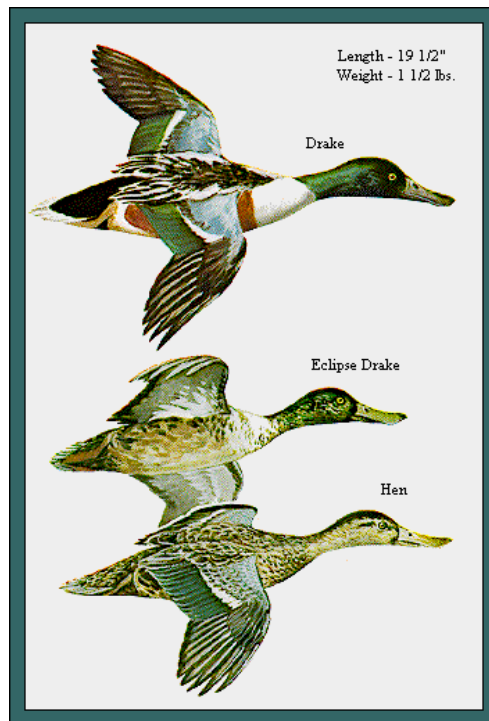
Because of the difficulties of directly measuring the day-to-day mortality of waterfowl from lead poisoning, various indicators of lead exposure have been developed and

used as indirect measures of lead shot exposure and poisoning. The most widely used method has been the gizzard survey, which estimates the incidence of spent shot ingestion at local sites at the time of sampling. Based on gizzard surveys, it has been estimated that as many as 40% of North American waterfowl ingest shot during a single season of exposure.

Lead poisoning by ingestion of lead pellets from the environment is referred to as primary poisoning. Secondary lead shot poisoning can occur when a predator or scavenger consumes animals that have been shot with lead shot shell ammunition and consequently carry lead shot pellets embedded in their bodies, or consumes the gizzard of a bird that has ingested lead shot. It was previously thought that this form of lead poisoning was a rare occurrence and probably did not constitute a significant wildlife management problem. However, research done in various countries over the past 5–10 years has demonstrated that secondary poisoning, particularly of raptors such as Bald Eagles (*Haliaeetus leucocephalus*), is a significant source of mortality in many places.

This information was compiled to give the reader an insight into issues related to non-toxic shot, its applicability and use. It gives a general overview of the issue of lead poisoning in waterbirds through the ingestion of spent lead shot, and it aims to give an introduction to possible solutions and strategies to tackle this issue effectively and to everyone's satisfaction.

In short, this information is meant as a practical guide, giving information and ideas and raising issues for thought and discussion. But above all, it is meant to encourage stakeholders at all levels to make an effort to give non-toxic shot a chance, and reduce or eliminate unnecessary waste of waterbird resource for the future!





## 2. Lead poisoning and alternative ammunitions



### *The Story in short*

The concept of lead poisoning is not new. Already in the late 1800s there were publications indicating that many specimens of ducks, geese and swans were dying from lead poisoning. The link between lead poisoning and hunting was soon discovered: many of the birds found dead carried lead shot pellets in their gizzards, and lead levels in their blood and tissues was high. It appeared that ducks, geese and swans have a habit of swallowing lead pellets. They mistake them for food items or grit, which is retained in the gizzard to facilitate the breakdown of the food.

### *Large annual deposition*

Lead shotgun shells used for hunting ducks and geese each contain about 200 -300 lead pellets, weighing around 30 grams in all. A hunter fires an average of three to six shells for every bird that is hit. Only a few of the pellets actually hit the bird. The rest fall to the ground or into the water. Thus, thousands of tonnes of lead are deposited in wetlands each year. In Canada, for example, the annual deposition was more than 2000 tonnes before the use of lead shot was banned in 1991. In France and Spain, these numbers are currently some 6250 and 5000 tonnes, respectively. These are no negligible amounts.



### *A problem is born*

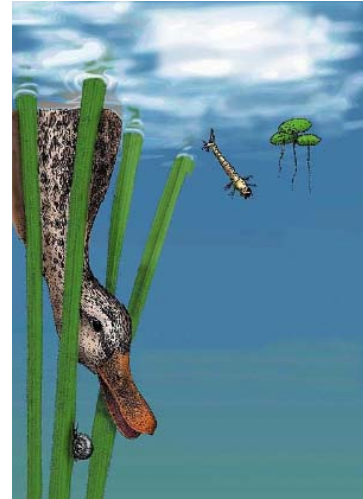
Waterbirds have no teeth. Therefore, just like chickens, they regularly ingest grit to facilitate the grinding of food in their gizzards. Shot pellets look just like grit, so birds sometimes inadvertently pick them up from the bottom and ingest them. Some are voided through the intestine but some may be retained.

The grinding action of the gizzard, combined with the acidic stomach juices, causes the retained pellets to dissolve easily. If this is the case the ionic lead then enters the blood stream through the wall of the intestine and that is when the trouble starts. Lead is a highly poisonous metal. Impeding the production of haemoglobin, the blood protein responsible for oxygen transportation, it can cause severe anaemia. In addition, it can affect the nervous and circulatory systems, liver and kidneys. Birds that ingest ten or more lead pellets will die of acute lead poisoning within a few days. If a smaller number - two to ten - is ingested, some birds may survive but others will gradually start to show signs of chronic lead poisoning,

such as drooping wings, green and watery faeces, weight loss and atypical behaviour. This influences their ability to forage and to escape from predators. Victims of chronic lead poisoning usually die within two to three weeks. If a bird swallows only one pellet, it usually survives, although its immune system and fertility could still be affected. Even low levels of lead impede energy storage, which is particularly problematic in migratory birds.

### ***On the hunter's plate***

After several incidences of large-scale die-offs in the United States, a lot of research was done in countries around the world e.g. in France (see Annex 1) to find out what the scale of this problem was. Based on worldwide data, it was estimated that the incidence of lead pellet ingestion during one single season lies between five and twenty percent. In the United States alone, one and a half to four million birds die of lead poisoning each year. Many hunters wonder about this: they seldom, if ever, find poisoned birds in the field and draw the conclusion that the problem cannot be that big. Poisoned birds, however, tend to retreat in dense vegetation in order to die peacefully. They won't be found out in the open. More importantly, they are often very quickly removed by predators or scavengers.



Because of that last factor, lead pellets are considered responsible for fifteen to twenty-five percent of post-fledging mortality in birds of prey, such as bald eagles (North America) and white tailed eagles (Europe). This is due to the fact that lead poisoned waterbirds are an easy prey for these raptors, many of which have a threatened status.

The health risk to humans is considerably less high. Humans don't have a muscular stomach; so ingested pellets usually pass through our digestive tract without being dissolved at all. It does happen occasionally that lead pellets are retained in the appendix, for example in avid game eaters. Patients in one Newfoundland study were reported to have up to two hundred lead pellets in their appendix! More importantly, high consumption not of lead pellets themselves, but of the meat of lead poisoned birds, may inadvertently lead to lead exposure and sometimes even intoxication. An average of fifteen percent of killed waterfowl exhibit lead levels that are higher than the generally accepted health standard of half a milligram of lead per kilogram of meat. In some of the research samples this standard was even exceeded by a factor of fifteen hundred. In other words, hunters and their dinner guests can find on their plates the unhealthy result of shooting with lead shot.

### ***Lead versus alternatives***

Shot pellets do not necessarily have to be made of lead. Several high-quality non-toxic alternatives have been developed so far, and acceptance of these alternatives among hunters has been increasing over the past several years. Examples of alternatives are made from steel, bismuth, zinc, tin, tungsten and several alloys of these metals. Other metals are too light, too hard, too expensive, or equally poisonous such as zinc. For a detailed description of several alternatives, and a comparison in different characteristics, please refer to Annex 2.

Steel is the most inexpensive alternative. Prices vary between regions, depending on the demand, which in turn is influenced by the national legislation. Steel cartridges are on average slightly more expensive than lead cartridges. An alternative some consider to be

superior and most comparable to lead (tungsten mixed with a polymer substance), however, is often ten times more expensive than lead. Therefore, because of its low cost and ready availability, steel has become the most widely used alternative.



The reason why hunters are still reluctant to switch to steel is that steel has two major disadvantages: it is much harder than lead, and its density is one third lower. Details of all resulting technical aspects can be found in Annex 2. The most important issues will be discussed here in general terms.

Steel's hardness causes hunters to believe that steel shot will wear the inside of their guns. This, however, is not true. Gun specialists agree in general that the damage (ring bulge) that might occur is strictly cosmetic and does not pose a threat to safety, nor does it alter the gun's patterning performance. However it is recommended before using non-toxic shot to check if the shotgun used is suitable for shooting of non-toxic shot. Moreover, when the instructions on non-toxic shot cartridge containers are properly followed, particularly with regard to the combination of choke and shot size, and when the gun is properly used, this damage can be largely prevented. However, the hardness of steel may cause the pellets to ricochet off hard surfaces, which may be a safety threat. In wetlands, as long they are not frozen, this is not considered to be a major problem when safety regulations are properly followed. Another, albeit minor, disadvantage of the hardness of steel is that pellets may cause damage to teeth when game meat is consumed in which one or several pellets are still present.

Table: Showing actual alternatives for lead shot in Denmark<sup>1</sup>

	Steel	Bismuth	Tin	Tungsten	Zinc
Toxic					+
Specific gravity, g/m <sup>3</sup>	7,9	9,8	7,3	10-11	7,3
Soft/ Hard	Hard	Soft	Soft	Soft	Hard
Stability	Stable	Risk of fragmentation	Stable	Stable	Stable
Woods	Not ok	Ok	Ok	Ok	Not ok
Comments	Several products	Limited availability?		Several combinations	Toxic?
Price in EURO	0.2-0.6	1	0.8	1.1	0.8

The lower density of steel is a much more important factor. Steel pellets lose their velocity much faster than lead pellets do, which influences their energy on impact and the maximum shooting distance. However, experienced hunters agree that 35 meters is the maximum shooting distance anyway, regardless of the type of ammunition. At this distance, the striking

<sup>1</sup> Table drafted by Mr Niels Kanstrup in 2003

energy of steel shot is comparable to that of lead shot when a slightly larger pellet size is used.

The use of steel shot may result in an increased pressure in chamber and barrel, since steel pellets are in some cases ('High Performance' cartridges) launched at slightly higher velocities to compensate for their lighter weight (the alternative being the use of larger pellets). These increased pressures, however, are still well within the internationally recognized standard proof pressures. Manufacturers recommend testing guns regularly regardless of which type of ammunition is used. Unfortunately this is not a common practice.

Steel does not only have disadvantages compared to lead. Due to their hardness, steel pellets hardly deform when the gun is fired. This allows for a more uniform shot column in comparison to lead pellets. Lead pellets can be slightly flattened, which causes them to scatter, increasing the risk of crippling birds. In addition, flattened lead pellets with a larger surface may push feathers into the wound. This decreases penetration and may reduce the effectiveness of the impact. Therefore, in contrast to what many hunters think, the use of steel shot does not increase the crippling rate. With sufficient practice and shooting within their own personal skill limits (indispensable regardless of shot type!) most hunters should be able to shoot just as well with steel shot as with lead shot.

An issue that also needs attention is the quality of the cartridges used. Too much attention is paid to shot material and too little to the composition and standard conformity of the cartridges. Muzzle velocity is a key factor and of higher importance for the shot efficiency than the shot material. But not all hunters are aware or really concerned about this.





### 3. Review of the issue



#### *A recently published update report*

In summary, lead shot is not necessary for hunting waterbirds. As indicated before there are non-toxic alternatives available which are more or less equally effective with proper hunting practice. Why, then, has lead shot not immediately been phased out in all countries?

This question has of course many answers. There are numerous factors - mainly of an organisational nature, specified below - that impede the efficiency of a large-scale operation like phasing out certain ammunition. Therefore, solving the issue requires an interdisciplinary approach, and to that end a few international projects have been initiated over the past years.

In 1982, the International Association of Fish & Wildlife Agencies (IAFWA) initiated a Cooperative Lead Poisoning Control Information Program (CLPCIP), in 1996 renamed Cooperative North American Shotgun Education Program (CONSEP). The objectives of this programme are to conduct research with regard to the use of non-toxic shot, and to organise workshops and training sessions aimed at promoting awareness among hunters and provide them with the skills necessary to successfully change to using non-toxic shot. The CONSEP workshops and training programmes serve as an example for governments and agencies worldwide to educate and train their hunters.

One of the first international initiatives to discuss these factors amongst a broad spectrum of interested parties was a workshop convened by the International Waterfowl and Wetlands Research Bureau (IWRB, now Wetlands International). This workshop was held in 1991 in Brussels and the proceedings were published in 1992. These still serve as a standard overview of the issue, and include essays about physiological, ecological, technical and organisational aspects.

To address the need to map persisting impediments and to assess the current situation in the Range States, the Implementation Priorities of the African-Eurasian Migratory



Waterbird Agreement (AEWA) require the publication of regular reviews of the issue. Wetlands International was requested to prepare these reviews, with financial support from AEWA and the UK Joint Nature Conservation Committee. Three such reviews have appeared so far, and the latest report, entitled *Lead Poisoning in Waterbirds. International Update Report 2000*, came out in 2001. This report describes the background of the issue, its scale, biological consequences, possible solutions as well as the advantages and disadvantages of the use of non-toxic shot. It furthermore reviews the major international conventions and agreements addressing the lead issue, and the developments which have been achieved. However, the main part of the report deals with the current situation and developments in individual countries.

For this section, a total of 137 countries and 11 organisations were queried, of which 74 and 9 responded respectively. Through detailed questions and short essay sections, the national contacts were asked to provide information on the current situation in their country concerning general situation, policy and legislation, awareness and education, research and development, co-ordination, and relevant references. Organisations and convention secretariats were asked to describe new developments in policies and legislation.

## Current legislative situation

The overall response to the questionnaire that formed the basis of the Lead Poisoning Update Report mentioned above, was 54% (74 out of 137). Of AEWAs Contracting Parties, 72% responded (23 out of 32). Seven countries reported to have a total statutory ban on the use of lead shot for all waterbird hunting: the USA, plus AEWAs Range States Canada, Norway, Finland, Denmark, The Netherlands, and Switzerland, the last four being Contracting Parties to AEWAs. In several countries there is a partial ban on the use of lead shot for waterbird hunting: there is a ban in certain (protected) areas, or for hunting certain species (see table).

**Table: Current legislation status in responding countries in the year 2000**

Country	Status	Country	Status	Country	Status
Canada	A	Cameroon	D	Egypt	F
Denmark	A	Chile	D	Gabon	F
Finland	A	Congo	D	Hungary	F
Netherlands	A	Iceland	D	Iran	F
Norway	A	Ireland	D	Italy	F
Switzerland	A	Kenya	D	Kuwait	F
USA	A	Lithuania	D	Mali	F
Australia	B	Luxembourg	D	Moldova	F
Belgium (Flanders)	B	Malawi	D	Namibia	F
Cyprus	B	Malta	D	Peru	F
Ghana	B	Mauritania	D	Thailand	F
Israel	B	Morocco	D	Ukraine	F
Japan	B	Romania	D	Gambia	U
Latvia	B	Slovak Republic	D	Algeria	N
Malaysia	B	Zimbabwe	D	Cape Verde	N
Russ. Federation	B	Botswana	E	India	N
South Africa	B	Czech Republic	E	Lebanon	N
Spain	B	France	E	Liberia	N
Sweden	B	Greece	E	Monaco	N
United Kingdom	B	Albania	F	Sri Lanka	N
Germany	C	Bosnia Herz.	F	Sult. of Oman	N
Argentina	D	Brazil	F	Togo	N
Austria	D	China	F	Uganda	N
Belarus	D	Croatia	F	Un. Arab Emirates	N
Cambodia	D	Ecuador	F		

(Explanation of letters: see following page)

A = There is a **total statutory ban** on the use of lead shot for waterbird hunting  
 B = There is a **partial statutory ban** (certain species, certain areas) on the use of lead shot for waterbird hunting  
 C = There is a **voluntary ban** on the use of lead shot for waterbird hunting  
 D = There is **no statutory or voluntary ban, but waterbird hunting is only a (very) small-scale activity**  
 E = Waterbird hunting is a medium/large-scale activity. There is no statutory or voluntary ban, but there is an awareness of the problem and **legislation is being considered**

F = Waterbird hunting is a medium/large-scale activity. There is no statutory or voluntary ban, nor any awareness of the problem; **legislation is not being considered**

U = It is **unknown** to the informer whether lead shot is used for waterbird hunting, and whether there is any legislation concerning the use of lead shot

N = There is **no waterbird hunting at all**, for whatever reason (e.g. no wetlands, total ban on all hunting, or no reason given)

It appears that there are several distinct factors that hamper the switch from lead shot to non-toxic alternatives:

- There is either **no awareness** of the problem, or a **disbelief in the harmful impact** of spent lead pellets.
- There is an awareness of the problem, but it is, whether rightly or not, **considered to be of minor importance**, e.g. hunting is a very small-scale activity; lead sinks into the bottom and becomes inaccessible to birds; only terrestrial species are hunted.
- There is an awareness of the problem, but a **lack of expertise, finances and logistics** inhibit developments.
- The **scale of the problem is unknown**. There is a need for research, but financial and logistical problems inhibit developments.
- Legislation, awareness campaigns, research and/or co-ordination are being considered, but for **bureaucratic reasons** this process is very slow.
- Even though there is legislation concerning the use of lead shot, or concerning hunting in general, there is **a lot of illegal hunting**. Effective enforcement is not possible because of a lack of finances and logistics.
- The lead poisoning problem is **not on the priority list for political reasons**, e.g. war, transition period, political unrest.
- **Non-toxic shot is either not available, or disproportionately expensive** because the demand for it is too low.
- The **production of non-toxic shot is not prioritised by manufacturers** who determine the market.
- There is a **lack of co-operation and communication** between hunters' organisations and authorities. Hunters indicate that authorities are too rigid in imposing legislation, while they ignore the cost, effectiveness, and safety aspects of steel shot. Hunters also claim that there is insufficient support with regard to education and practical workshops, and that gun proofing facilities are lacking. Authorities report that hunters are reluctant to switch to steel shot for traditional reasons and prevailing misconceptions, which they seem unwilling to overcome.

These results have been taken into consideration at meetings of the AEWA Technical Committee, resulting in the emergence of recommendations and a draft resolution for the Second Meeting of the Parties to AEWA (see the chapter 'Further steps under AEWA').

**Information:** [http://www.wetlands.agro.nl/news/Documents/Lead\\_P\\_Report.htm](http://www.wetlands.agro.nl/news/Documents/Lead_P_Report.htm)

## 4. Conventions and Agreements relevant to the lead poisoning issue

### ***Introduction***

AEWA is the only multilateral environmental agreement that specifically addresses the necessity to phase out the use of lead shot for hunting in wetlands. However, this issue naturally does not stand on its own but is associated with general conservation concepts such as wise use, sustainable development, risk reduction, and the precautionary principle. Together with Conventions such as the Convention on Biological Diversity and the Ramsar Convention on Wetlands of International Importance, AEWA provides a legal framework to address the protection of waterbirds and their habitats.

In order to view the lead shot issue in a broader context, it is interesting to note the position that other conventions and agreements take on the concepts mentioned above. The following section gives a brief overview of the conventions themselves, and of their respective sections that are relevant to waterbird protection in general and the lead shot issue in particular.

### ***The Convention on Biological Diversity (CBD)***

In 1992, the Convention on Biological Diversity, the first global agreement on the conservation and sustainable use of biological diversity, was concluded. CBD gained rapid and widespread acceptance. Over 150 governments signed the document in 1992 at the Rio conference, and since then more than 188 countries<sup>2</sup> have ratified the agreement.

CBD has three main goals:

- The conservation of biodiversity,
- Sustainable use of the components of biodiversity, and
- Sharing the benefits arising from the commercial and other utilization of genetic resources in a fair and equitable way

CBD is comprehensive in its goals, and deals with an issue so vital to humanity's future, that it stands as a landmark in international law. It recognizes - for the first time - that the conservation of biological diversity is "a common concern of humankind" and is an integral part of the development process. Among others, it links traditional conservation efforts to the economic goal of using biological resources sustainably. Importantly, CBD is legally binding; countries that join it are obliged to implement its provisions.

Although CBD does not name lead poisoning specifically as a threat to biodiversity, it addresses through its Decisions all the major underlying principles, and leaves no question that wetlands should be used sustainably and that all environmental impact should be minimised. Decision IV/4, for example, deals with 'status and trends of the biological diversity of inland water ecosystems and options for conservation and sustainable use', and urges Parties and Governments to include inland water biological diversity considerations in their participation and collaboration with organisations, institutions and conventions affecting or working with inland water resources. Specifically, it urges Parties to investigate the processes contributing to the loss of biological diversity of inland water ecosystems, through targeted research including investigations into the impacts of harmful substances, and the

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<sup>2</sup> As of 1 August 2004

identification of measures needed to address these issues where they constitute threats to inland water ecosystem biological diversity.

Decision VI/13, 'Sustainable use', stresses that the challenge of sustainable use of biodiversity is to balance the need to maximise human livelihoods against the necessity of conserving the underlying natural resource base, and that the involvement and participation of all stakeholders, including indigenous and local communities, in natural resource management is a prerequisite for their conservation and sustainable use. Importantly, this decision highlights the collaborative efforts and synergies developed between CBD and other international organisations such as the Ramsar Convention. Also, it addresses the need to compile case studies submitted by Parties, other Governments, international organisations and other relevant organisations on the sustainable use of biological diversity, and to make those available through the clearing-house mechanism of CBD.

**Information:** <http://www.biodiv.org>

### ***The Ramsar Convention***

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. There are presently<sup>3</sup> 140 Contracting Parties to the Convention, with 1374 wetland sites, totalling 121,4 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance.

The Ramsar Convention does not specifically address the lead poisoning issue, but addresses it indirectly by urging its contracting parties to conserve wetlands and their species, and to use them sustainably.

Recommendation 6.14 provides a framework within which the toxic threats to wetlands should be addressed: "Many of the principles articulated in the Convention, such as wise use, environmental impact assessment, and ecological character, should include recognition of the harmful impacts of toxics."

Recommendation 9 (Promotion of Hunting Research and Education) 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.

**Information:** <http://www.ramsar.org>

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<sup>3</sup> As of 18 August 2004

### ***The Convention on the Conservation of Migratory Species***

One of the conventions developed under auspices of the United Nations Environmental Programme (UNEP) is the Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention, after the German city where it was concluded in 1979). This convention aims to conserve terrestrial, marine and avian migratory species throughout their range. It is one of the small number of intergovernmental treaties concerned with the conservation of wildlife and wildlife habitats on a global scale. Since the Convention's entry into force on 1 November 1983, its membership has grown steadily to include 86<sup>4</sup> Contracting Parties from Africa, Central and South America, Asia, Europe and Oceania.

CMS parties work together to conserve migratory species and their habitats. Particular focus is on co-ordinated species conservation and management plans, conservation and restoration of habitat, control of factors impeding migration, co-operative research and monitoring, and public education and exchange of information among parties. In addition, strict protection is provided for a specified number of endangered migratory species.

Several agreements have been concluded under CMS. These may range from legally binding treaties to less formal memoranda of understanding. The most important agreement with regard to the lead poisoning issue is Agreement on the Conservation of African-Eurasian Migratory Waterbirds, described below.

CMS itself has taken no specific action on the matter of lead poisoning.

**Information:** <http://www.cms.int>

### ***The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)***

The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) developed under CMS, was concluded on 16 June 1995 and entered into force on 1 November 1999.

AEWA covers 235 species of birds ecologically dependent on wetlands for at least part of their annual cycle, including many species of pelicans, storks, flamingos, swans, geese, ducks, waders, gulls and terns. The agreement encompasses 117 Range States (including the European Union) from Europe, parts of Asia and Canada, the Middle East and Africa. In fact, the geographic area covered by AEWA stretches from the northern reaches of Canada and the Russian Federation to the southernmost tip of Africa. Currently<sup>5</sup>, the number of Contracting Parties is 47.

The agreement provides for co-ordinated actions to be taken throughout the migration systems of the waterbirds to which it applies. Parties to the agreement engage in a wide range of conservation actions, which are described in a comprehensive action plan. This detailed plan is the product of extensive negotiations and discussions among governments, and addresses issues such as species and habitat conservation, management of human activities, research and monitoring, education and information, and implementation. A key element of the AEWA Action Plan are the Conservation Guidelines, one of which, the Guideline on Sustainable Harvest, gives advice to parties to the Agreement on best practice and policy for hunting.

At its first session the Meeting of Parties adopted a Resolution on phasing out lead shot in wetlands (see Annex 2).

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<sup>4</sup> As of 1 August 2004

<sup>5</sup> As of 1 August 2004

Paragraph 4.1.4 of the Action Plan reads as follows: *Parties shall endeavour to phase out the use of lead shot for hunting in wetlands by the year 2000*. It was acknowledged by the Meeting of the Parties that many Range States currently have technical difficulties in phasing out lead shot. Therefore, the Technical Committee of AEWA was requested to review the experience of those countries that have already done so, or are endeavouring to do so. Based on this review and in consultation with the hunting organisations, gun and ammunition manufacturers and traders, the Technical Committee brought elaborated guidance to the Meeting of the Parties at its second session in September 2002. This resulted in the acceptance of a new resolution: Resolution 2.2 on Phasing out Lead Shot for Hunting in Wetlands (see Annex 3).

The review mentioned above was one of the projects outlined in the International Implementation Priorities 2000-2004, adopted by the Meeting of the Parties at its first session. These Priorities were extended at the Second Meeting of the Parties to include 2003-2007. Beside this regular review of the use of non-toxic shot for waterbird hunting, the Implementation Priorities also include the organisation of workshops to provide important guidance for decision-makers and hunters' organisations on how to solve this problem. In addition, the AEWA Secretariat has taken up the task of publishing information material targeting a wide range of stakeholders, including policy-makers and hunters. This information material includes a special issue of the AEWA Newsletter (see Annex 4), entirely dedicated to non-toxic shot, and a series of articles for national hunters' magazines (see Annex 5).

**Information:** <http://www.unep-aewa.org>

### ***The Bern Convention (initiated by the Council of Europe)***

The Council of Europe is an independent, intergovernmental organisation with several humanitarian, democratic, and cultural aims. Its mission statement also includes environmental protection. The Council of Europe counts 45 member states. The 25 European Union states are all members of the Council of Europe.

Council of Europe work leads to European conventions and agreements in the light of which member states subsequently harmonise and amend their own legislation to comply with them. Some conventions and agreements are also open for adoption by non-member states. The results of studies and activities are available to governments in order to foster co-operation, environmental protection and social progress in Europe.

Conventions and agreements are organised in the European Treaty Series (ETS). The issue of lead poisoning is particularly addressed in one convention, listed as ETS No. 104: The Convention on the Conservation of European Wildlife and Natural Habitats. This convention is also known as the Bern Convention.

The Bern Convention entered into force in 1982 and is also open to European and African non-member states. It has been ratified by 39 member states, the European Community, Monaco and four African states (Burkina Faso, Morocco, Senegal and Tunisia).

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 asks 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. Many of these species (e.g. ducks, geese, swans, loons, waders, and raptors) are, due to their preferred habitat and feeding methods, most at risk of lead poisoning.

Recommendation No. 28 concerns the use of non-toxic gunshot in wetlands (see Annex 6). After the adoption of this recommendation by the Standing Committee of the Bern Convention in 1991, no further activities have been undertaken on the specific matter of lead poisoning. However, lead poisoning is mentioned as one of the main causes of mortality in the Marbled Teal (*Marmaronetta angustirostris*), for which a European Action Plan (drafted by Wetlands International) was adopted by the Bern Convention. This plan is monitored by a Bern Convention/ BirdLife International Group of Experts on Bird Conservation, which meets every three years and gives the Contracting Parties advice on the implementation of the plans. The Plan has also been approved by the European Commission's Ornis Committee and endorsed by CMS COP5.

**Information:** [http://www.coe.int/t/e/Cultural Co-operation/Environment/Nature and biological diversity/](http://www.coe.int/t/e/Cultural_Co-operation/Environment/Nature_and_biological_diversity/)

### ***The Birds and Habitat Directives (initiated by the European Commission)***

The European Commission is the executive body of the European Union and, in that capacity, responsible for designing, implementing and managing policy and legislation within the EU. In order to conserve biodiversity in the EU, legislation has been adopted in the form of the Birds and Habitat Directives. The Ornis Committee, operating under the EC Environment Directorate and consisting of representatives of the 25 EU member states, takes decisions to implement the Birds Directive EC/79/409. The issue of lead poisoning in waterbirds has been discussed in this regard; the Committee has not proposed any joint EU action but has recommended that each member state take its own measures. Consequently, the European Commission has neither proposed nor taken any action in this field.

**Information:** <http://europa.eu.int/comm/environment/nature/>

### ***The Declaration on Risk Reduction for Lead (initiated by the OECD)***

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation in which representatives of 30 industrialised countries in North America, Europe and the Pacific, as well as the European Commission, meet to co-ordinate and harmonise policies, discuss issues of mutual concern, and work together to respond to international problems. Most of the OECD's work is carried out by more than 200 specialised committees and subsidiary groups made up of country member delegates.

The OECD, as part of its Risk Management Programme, has been investigating problems associated with lead since 1991. In addition to producing a background document on lead in 1993, the OECD organised a workshop in Toronto in 1994 investigating international views on the (eco)toxicological risks associated with lead, and providing directions for improved risk assessment and management. The workshop also specifically addressed the environmental risks associated with the use of lead shot and lead fishing sinkers, including the impact on waterbirds.

Leading on from the OECD workshop discussions and previous work for the Risk Management Programme, Environment Ministers from OECD member nations adopted a "Declaration on Risk Reduction for Lead" in 1996. The purpose of the Declaration was to advance national and co-operative efforts to reduce the risk from exposure to lead, giving high priority to certain actions. One such action was to restrict the use of lead shot in wetlands and promote the use of alternatives to lead sinkers in shallow waters. In support of this Declaration, the lead industry (e.g. paint, battery, fuel and ammunition manufacturers) was encouraged to make best use of its expertise by making it available to OECD and non-

OECD countries, and to develop a voluntary programme with activities to reduce lead exposure, in co-operation with national authorities and OECD countries.

As part of its work on Risk Management, the OECD issued a “status report monograph” on lead in 1999. In this report, which is based on questionnaires filled in by member states, the observation is made that Belgium, Canada, Sweden and the USA have made considerable progress concerning their legislation on the use of lead shot and fishing weights.

**Information:** <http://www.oecd.org>

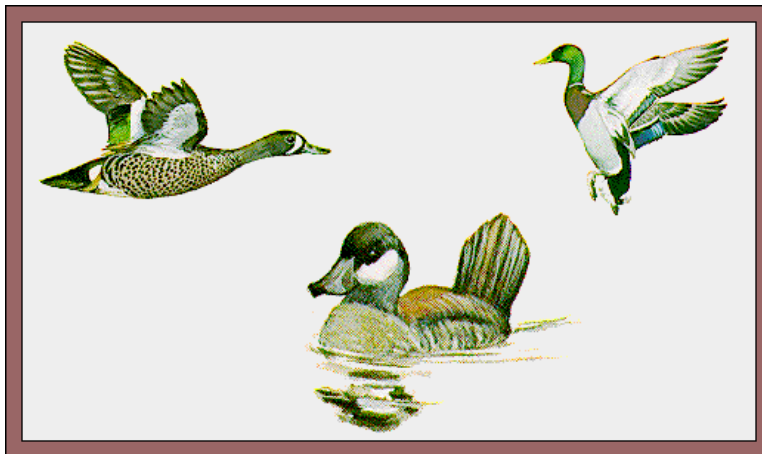


## 5. An Overview of initiatives

### *Non-toxic shot is gaining territory*

The United States and Canada provided the kick-off. A few others have followed: Denmark, England/ Wales, The Netherlands, Finland, Norway, and Switzerland. Common factor is the ban on the use of lead shot for all hunting in wetlands. Slowly but gradually, other countries are starting to take similar actions.

As indicated in previous paragraphs, the use of lead shot is not in accordance with the principal of wise use. Ecosystems and species are affected worldwide. Therefore many countries have decided or will decide in the near future to restrict the use of lead shot and promote the use of alternative, non-toxic materials.



### *International agreement*

Already in 1894 a scientific publication indicated that many specimens of duck, geese and swans were dying from lead poisoning by ingested lead pellets. It took almost a century, and many large-scale die-offs of waterbirds around the world, until the first few countries started to take the issue seriously. The International Association of Fish and Wildlife Agencies (IAFWA) started this process in the 1980s and 1990s by initiating a series of educational programmes for hunters, which emphasised the need for the use of alternative ammunition. Political action soon followed. In 1991, the United States were the first nation to ban the use of lead shot for waterbird hunting. International co-ordination of similar actions started in that same year when the International Waterfowl and Wetlands Research Bureau (IWRB, now Wetlands International) convened a workshop to assess the scale of the issue, and to discuss possible solutions.

The outcomes of this workshop led to the formulation of regulatory statements in a number of international Conventions and Agreements, notably the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA). As already mentioned before, paragraph 4.1.4 of AEWA's Action Plan literally states that *Parties shall endeavour to phase out the use of lead shot for hunting in wetlands by the year 2000*. Both at the first and second sessions of the Meeting of Parties to AEWA Resolutions on '*Phasing out lead shot for hunting in wetlands*' were adopted (see Annex 2 and 3). The Meeting of Parties

urged the Contracting Parties to AEWA to phase out lead shot but also requested that the Agreement Secretariat gather and disseminate knowledge and expertise at international level by making information material available. One of the actions taken by the UNEP/ AEWA Secretariat was to publish a special issue of the AEWA Newsletter dealing solely with the issue of lead shot.

Although some progress has been made in the implementation of the Resolutions mentioned above banning the use of lead shot for hunting in wetlands on an international scale is still a distant ideal. The following AEWA Range States actually have banned out the use of lead shot in wetlands: Canada, Denmark, England/ Wales, Finland, The Netherlands, Norway and Switzerland.

It is worth mentioning that recently France decided to ban the use of lead shot in wetlands as of 2005, and also that the 50<sup>th</sup> General Assembly of the International Council for Game and Wildlife Conservation (CIC) adopted a Resolution on the problems of the use of lead shot for hunting in wetlands (see Annex 7).



Introducing legislation concerning the use of lead shot is a process with many difficulties. Niels Kanstrup, director of the Danish Hunters' Association Kalø and President of the CIC Migratory Waterbird Commission, is positive about the way the ban on lead shot was introduced in his country. "Having observed the phasing-out of lead shot in Denmark during the last fifteen years," Kanstrup explains, "I have listened to – and taken part in – a lot of discussions. The authorities have been quite firm, but they have also been willing to listen to the hunters and their organisations." In Denmark, the authorities applied a stepwise introduction of the ban on the use of lead shot. This way, the new legislation allowed for a period of education campaigns and training for hunters. All stakeholders had a chance to adapt to the new situation. "The hunters have been open and willing to take up the challenge," Kanstrup adds, "mostly with the overall motive of manifesting a good image of hunters being a responsible partner in modern nature management. Looking back, the process has absolutely been a case of 'win-win'."

### ***Proper hunting practice***

Not in all countries is the switch in legislation going as smoothly as in Denmark. There appear to be a number of factors that impede the process. Firstly, there is the question of awareness. In many countries, the issue is not known beyond a narrow circle of specialists. Research into the incidence and exact scale of the problem on the national level has been carried out in just a few countries. Even though there is general data available on the impact of lead shot, policy makers seem to want specific information about the extent to which their own country is subject to the issue. Setting up research programmes, of course, costs time and money.

Even if hunters know about the effects of lead on the environment, they are not enthusiastic about switching to using non-toxic shot. "Many hunters are very sceptical about

alternatives,” says Niels Kanstrup. “This is not because they had any negative experience with it, but because “they always used lead”. In other words, hunters are conservative.” True, alternative shot has other properties than lead shot, but with training and proper hunting practice, hunters can easily adapt to these features of alternatives, says Kanstrup. He finds it deplorable that prejudices against alternative shot are widely persistent. “Honestly, I do not care very much what shot I use,” he says. “To shoot large birds like geese and heavy sea ducks, I always choose high performance shot – mostly steel shot size 3,5 mm to 4 mm. For smaller game species I will use any alternative with a standard load (28 gram). I have absolutely no worry concerning damage to my gun or risk of explosion.” However, Kanstrup has had to make adjustments to his hunting style. “In general, I am more aware of shooting distances than before,” he explains, “and today I keep monitoring the number of shot used per bagged animal, which should always be somewhat below three. Concerning security I am aware of the higher risk of ricochets from hard shot (mostly steel), although this has caused no increase in numbers of hunting accidents in Denmark. In areas where you might hit hard surfaces (ground, stones, trees) I would normally use soft shot.”



### ***Increasing demand***

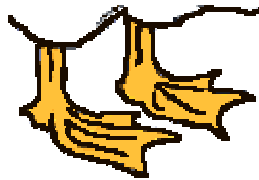
Why then, if alternative shot seems to be satisfactory, do not all countries adjust their legislation? The answer to that often lies in the fact that phasing out lead shot is often not given the highest priority by the policy officers, perhaps because they are not aware of the real problem. Even if both the national authority and the hunting community are aware of the problem, and even if they agree that a solution should be sought in order to comply with the wise use principle, it still is not always easy to get the ball rolling. Ammunition manufacturers have to switch to producing non-toxic shot, for example. Although in principal the manufacturers don't have any problems with this they are still hesitant to make this step. They fear that due to higher costs and lower demand, they will be the ones that pay the price. This fear is understandable, although it is estimated that with changing legislation, and consequently increasing demand, profits for manufacturers will not be likely to drop.

And then there's the question of finances, logistics and expertise on the side of the authorities in charge. Research, change of legislation, monitoring and enforcement efforts are costly and require good planning. Many countries are not in a position to prioritise these actions, due to factors such as political unrest or an economic transition period. “The Danish example of banning all use of lead for hunting seems to be too ambitious for most other countries,” states Niels Kanstrup. “To many of them, hunting-related lead poisoning is a rather limited problem compared to general conservation needs. To address the problem worldwide there is a clear need for a constructive dialogue on a national and international level between governments, nature conservationists and hunters. Such co-operation is a precondition to maintain the momentum of the process of phasing out lead shot in wetlands.”

Some countries are doing all that is in their capacity. A very positive example in that respect is being set by Spain. In Spain, a country with a large waterfowl hunting tradition, research showed that thirty to fifty thousand waterbirds annually die due to lead shot ingestion. Incidence of lead shot ingestion lies at around fifty percent. Therefore the authorities recently introduced a ban on the use of lead shot over wetlands that are protected under the international Ramsar Convention. This will strongly decrease the annual 5000-ton lead deposition, since these wetlands are the principal hunting areas in Spain.

## **Workshop**

The story is therefore not just a negative one. True, compliance with the African-Eurasian Migratory Waterbird Agreement (AEWA) is still rather low, but things are slowly changing for the better. More and more countries have put forward a date for the introduction of measures, whether statutory or voluntary. Campaigns are being set up, communication networks are being established among hunting associations, nature conservation organisations, authorities and ammunition manufacturers. In 2001, the Federation of Associations of Hunting and Conservation of the E.U. (FACE) and the UNEP/ AEWA Secretariat jointly organised a Non-toxic Shot Workshop in Romania, aimed to introduce the issue in all its various aspects to the Central and Eastern European hunting community. Delegates attended this meeting from Romania, Hungary, the Czech Republic, Slovakia, Slovenia and Ukraine. Furthermore speakers representing conservation organisations, hunting federations and guns and ammunition manufacturers from United Kingdom, Denmark, France, Belgium and the Netherlands were present.



The participants agreed on the formulation of the following Workshop Outcomes:

*In order to avoid unnecessary deaths of waterbirds because of poisoning through the ingestion of spent lead shot, and the resulting contamination of the environment, the participants recommended that the phasing out of lead shot over wetlands, in accordance with the international commitments under AEWA, should be speeded up by:*

- *Increasing international co-operation (with AEWA, FACE, CIC, CIP, manufacturers, etc.) to achieve the objective*
- *Collecting existing information and disseminating it through appropriate networks (AEWA, FACE, CIC) to those countries yet to phase out lead shot*
- *Encouraging investigations, where appropriate, to assess the scale of ingested lead shot poisoning at the national level*
- *Developing guidelines, based on existing experience, to address the specific requirements of developing countries and those with economies in transition*
- *Raising awareness about the problem and possible solutions among user groups and decision makers, through*
  - *material for grassroots-level in appropriate languages (leaflets/hand-outs, etc.)*
  - *special issues of AEWA/FACE/CIC newsletters*
  - *hunting magazines, etc.*
- *Educating and training of hunters in the effective use of non-toxic alternatives*
- *Facilitating and encouraging improvement of shooting through practising at shooting ranges, etc.*
- *Standardising product description by cartridge manufacturers*
- *Encouraging the local manufacture of non-toxic cartridges*
- *Creating incentives for introducing alternatives*

- *Encouraging further development of effective non-toxic shot*
- *Finally, participants recommended that hunting interests are fully involved in all debates and developments concerning the future use of lead shot in east European and other countries.*

For the near future similar workshops are planned for other regions. The word is spreading that alternative shot does not even perform all that badly in the field. This is the development that we need to minimise the unnecessary losses of waterbirds in the future.



## 6. Further steps under AEWA

### ***Overview of further steps under AEWA***

Over the past two years, the AEWA Technical Committee has discussed how the implementation of the phasing-out of lead shot, which is one of the obligations of Parties to AEWA, could be stimulated and facilitated. In 2002 the Technical Committee thoroughly discussed and revised a draft of a new AEWA Resolution (prepared by the AEWA Secretariat) especially aimed at phasing out the use of lead shot in wetlands. This draft resolution was scrutinized and accepted at the Second Meeting of the Parties (MOP2) in Bonn, Germany, 25-27 September 2002.

The Resolution proposes, among other things, to continue the process of phasing out lead shot and to render this more feasible by introducing legislation in distinct phases. Very importantly, it requests Parties to make their phasing-out deadlines public, and report on progress and any problems encountered. Also, the Resolution proposes actions to ensure communication and co-operation, particularly concerning the exchange of expertise, logistics and finances.

In the AEWA Implementation Priorities, the issue has taken a prominent position. Concrete results have been the formulation of the new resolution, but also the co-financing of the International Update Report on Lead Poisoning in Waterbirds published by Wetlands International, the organisation of the workshop in Romania and the planning of a similar workshop in the near future, and the publication of several kinds of information material. This reader is also an example of actions of the AEWA Secretariat to raise awareness of the issue among hunting federations and policy makers.

AEWA actions foreseen in the future reflect a continued dedication to achieve an AEWA region-wide ban on the use of lead shot in wetlands. However, AEWA realises that legal action alone is not going to be effective. Awareness-raising activities in combination with training and education remain the main focus, together with coordination and cooperation efforts on flyway level. An important step forward will be the establishment of a special working group under the AEWA umbrella, coordinated by the AEWA Technical Committee, comprising representatives of all the main stakeholder groups, such as FACE, CIC, Wetlands International, BirdLife International, CIP, manufacturers, etc.

The AEWA Technical Committee will keep a close watch on the issue, and will bring recommendations to the Third Meeting of the Parties (MOP3). By then a new edition of the International Update Report on Lead Poisoning in Waterbirds will be available. Also, as dictated by the newly adopted Resolution 2.2 on Phasing Out Lead Shot in Wetlands, the Contracting Parties are expected to present at MOP3 elaborate progress reports on their situation. It is expected that this will help to pinpoint difficulties and uncertainties at the national level, and that this will be able to contribute to an enhanced effort to take coordinated action at the international level, and create a flow of knowledge and expertise throughout the Agreement area.

**Information:** <http://www.unep-aewa.org>

## 7. Some useful practical information:

### *Fact sheets about non-toxic shot on the Internet:*

#### **African-Eurasian Migratory Waterbird Agreement:**

<http://www.unep-aewa.org/eng/info/Leadshot/leadpage1.htm>

#### **Canadian Fish and Wildlife Service:**

<http://www.cws-scf.ec.gc.ca/theme.cfm?lang=e&category=6>

#### **Department of Natural Resources, State of Victoria, Australia:**

<http://www.dse.vic.gov.au> (information on hunting/ non-toxic shot can be found under the topic recreation & tourism)

### *Some more useful Internet sites:*

#### **General information on lead poisoning:**

- Very comprehensive French site: <http://www.univers-nature.com/dossiers/plomb/>
- Good overview of the issue and its implications:  
<http://www.swansociety.org/issues/lead/0102lead.html>

#### **Ammunition:**

- Browning: <http://www.browningint.com>
- Remington: <http://www.remington.com/ammo/shotshell/shotshell.htm>
- Useful site with many good tips and links: <http://www.wildfowling.co.uk>

#### **Organisations:**

- AEW (Agreement on the Conservation of African-Eurasian Migratory Waterbirds): <http://www.unep-aewa.org>
- Wetlands International: <http://www.wetlands.org>
- FACE (Federation of Hunting Associations and Conservation of the European Union): <http://www.face-europe.org>
- CIC (International Council for Game and Wildlife Conservation): <http://www.cic-wildlife.org>
- British Association for Shooting and Conservation: <http://www.basc.org.uk>
- IUCN (International Union for the Conservation of Nature): <http://www.iucn.org>
- Wildfowl and Wetlands Trust: <http://www.wwt.org.uk>

### ***Some key publications on lead poisoning in waterbirds:***

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