



ASPECTS CONCERNING THE LEAD SHOT USED BY HUNTERS IN ROMANIA AND OTHER COUNTRIES

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Abstract

In this paper, legislative issues regarding the situation of hunting lead shots in the US and Europe are presented on the use of lead shots for waterfowl hunting.

It was also analyzed the situation of the lead dispersed under the cartridge form, number and amount of shots and for the approved/accomplished crop quota for the hunting stock No.29 Cefa that is representative in Bihor county from the assessed standpoint (waterfowl, large number of hunters). For now, the situation it is not alarming yet compared to other states or areas (Camargue region of France).

Keywords: lead shot, harvest quota, wetlands, non-toxic alternative munitions, hunting stock

INTRODUCTION

Pollutant is any substance, prepared under a solid, liquid, gaseous or vapor form, or of energy, electromagnetic, ionizing, thermal, sound or vibration radiation which introduced into the environment, alter the balance of its constituents and of living organisms and cause damage to the material property (according to the Emergency Ordinance 195/2005 on environmental protection, modified on the 1st of January 2012). There is a distinction between contamination and pollution. Contamination is achieved when a substance is present in the environment, but does not cause adverse effects, while pollution is restricted to cases when the negative effects are obvious.

Heavy metals (Pb, Hg, Cd) are considered very toxic to humans and living organisms and the sources of exposure are:

- *Natural*: the earth's crust and all the biosphere compartments, minerals, volcanic dust etc.

- *Artificial*: - steel industry, waste incineration, coal and oil combustion, cement production, wood combustion, professional activities, etc.

Special sources of exposure to lead are: lead-based paints, smoking (3-12 μg / cigarette; 2% of it is transferred into smoke, resulting in 1.2 to 4.8 μg Pb / 20 cigarettes), occupational exposure (mining, welding, printing, melting, rubber industry, production of batteries), food industry, water supply pipes of lead, lead shots in hunting.

From a legal standpoint, the values used for the population at European level are:

← for the quality of the drinking water, the limit value is 10 μg Pb/L, according to Directive 98/83 / EC on the quality of water for human consumption;

← For the air quality, the limit value is of 0.5 μg Pb/m³, according to Directive 99/30 / EC on establishing the annual limit values to protect the human health. In areas located near industrial sources, since 01/01/2005 the limit value is of 1.0 μg Pb/m³.

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In terms of lead used in hunting, the two special issues that bring two discussions regarding contamination, pollution and toxicity:

- the actual fires, highly concentrated in some places (bogs);
- waterfowls which ingest the available shots for an easy digestion.

There are no studies regarding the waterfowl hunting sessions, however, anecdotally the situation is mentioned as follows: 50 lead shots were found in the Appendix of a hunter in the Camargue region (France) during an appendectomy. Serious cases of lead poisoning have emerged but in the manufacturers of cartridges - (former Czechoslovakia). There are several effects on birds in these areas:

- Mortality is directly related to the ingestion of Pb (Moll, 2000):

- 1 ball of Pb → mortality rate of 9% in 20 days;
- 2 balls Pb → mortality rate of 25% in 20 days;
- 3 balls of Pb → mortality rate of 67% in 20 days;
- 4 balls Pb → mortality rate of 99% in 20 days.

- Effects on health, behaviour, orientation, reproduction, etc. in the waterfowl.

MATERIAL AND METHODS

In Bihor county, the hunting stock No.29 Cefa is one of the most populated stock by waterfowl (pond) and the number of hunters is in accordance (the number of hunters is 68 in 2 groups). In the conducted

study it was desirable to compare the situation here with areas highly exposed to the analyzed problems in other EU countries to see the actual situation in our country to be prepared to deal with such issues in the future.

Among the most exposed areas in Europe, we can mention Camargue region, France. Here, according to MATE (2001), 31.8% of the analyzed birds had at least one ball ingested, estimating also a high concentration of lead in the body with the risk of lead poisoning. The hunting lead shots appear here as dispersed waste. In France there are annually fired approximately 250 million cartridges.

250 million cartridges x 300 shots/ cartridge → 75 billion shots

Their weight is about 6000 t.

In the wild, it takes 30-200 years as a Pb ball to disintegrate and dissolve. The dispersion of these 6,000 t Pb / year does not pose any environmental problem or human health and wildlife threat, with one exception: the waterfowl.

If such a lead ball decomposes in more than 30 years, within the gizzard of the waterfowls, it digested in just 20 days.

For the hunting stock no. Cefa 29, data were taken from AJVPS Bihr for 2014-2015 to determine the amount of lead that could spread during a hunting season.

Table 1. Area of the hunting stock on use categories (source: AJVPS Bihor)

U.M.	Cinegetically productive for:						Cinegetically unproductive	GENERAL TOTAL Col.1+6+7
	Game waterfowl	Rest of game species						
	Water surface (water streams, channels, ponds, lakes, etc.)	Forest	Arable, hay-field, vineyards, orchards, etc.)	Pasture, common pastures	Alpine barren zone	Total col. 2+3+4+5		
0	1	2	3	4	5	6	7	8
Ha	500	235	10053	173	-	10461	25	10986
%	4.6	2.1	91.5	1.6	-	95.2	0.2	100

Table 2. Species of game for which evaluation is not made on sexes (source: AJVPS Bihor)

Crt. no.	Species of game	Optimum number (piece)	Assessed number (piece)		Harvest quota 2014/2015		Achieved percent, (%)	Size of shot, (mm)
			2014	2015	Approved	Achieved		
1	Rabbit	1400	1700	1700	240	240	100	3.5
2	Pheasant	300	700	700	320	320	100	3.0
3	Weasel	x	10	10	1	0	0	3
4	Musk rat	x	200	200	50	0	0	3



Table 3. Species of game for which evaluation is not made (source for the harvest quota AJVPS Bihor)

Crt. no.	Species of game	Harvest quota 2014/2015		Achieved percent, %	Size of shot, mm
		Approved	Achieved		
1	Collared dove	150	65	43.3	2.0
2	Quail	300	77	25.7	2.0
3	Skylark	150	68	45.3	2.0
4	Fieldpore	20	0	0	2.0
5	Bean goose	20	0	0	4.0
6	Grey-leg goose	80	0	0	4.0
7	White-fronted goose	100	57	57.0	4.0
8	Mallard	600	319	53.2	3.5
9	Teal	100	0	0	3.0
10	Ferruginous duck	50	0	0	2.0
11	Coot	50	15	30.0	3.0
12	Common snipe	10	0	0	2.0
13	Magpie	50	28	56.0	2.0

To determine the quantity of shots necessary for the accomplishment of harvest quota, there are known:

Table 4. Number of shots that are included in a cartridge (Cotta, 1982)

Calibre and length of the tube	Weight of shots' load (g)	No of shots of size ... mm					
		2	2.5	3	3.5	4	4.5
12/70	35.5	780	390	220	140	95	70
12/65	34.5	750	370	215	135	90	65
16/70	31.0	675	335	190	125	85	60
16/65	28.5	625	310	175	115	75	55
20/70	26.5	575	285	165	105	71	53
20/65	25.5	555	275	160	100	68	50

For the hunting stock Cefa, by respecting the harvest quota accomplished during the season 2014-2015 and processing the data in Tables 1-4.it resulted:

- Approx. 2700 fired cartridges fired, 745 000 shots (of 2-4mm) respectively, on the entire hunting stock with an average of 1,095 shots/ ha

- Approx. 96 kg Pb / season

- On the 500 ha of water surface, channels, rivers, the average amount of dispersed Pb was 0.08kg / ha.

If the reports are made with respect to the approved harvest quota, these values could increase to:

- Approx. 5132 fired cartridges, respectively 1142000 shots (of 2-4mm) on the entire hunting stock with an average 1,740 shots/ ha

- Approx. 182 kg Pb / season

- On the 500 ha of water surface, channels, rivers, the average amount of dispersed Pb was 0.193kg / ha.

RESULTS AND DISCUSSION

Based on data above, Figure 1 presents the Pb dispersed according to the achieved harvest quota but also in the case in which this quota would have been fully achieved.



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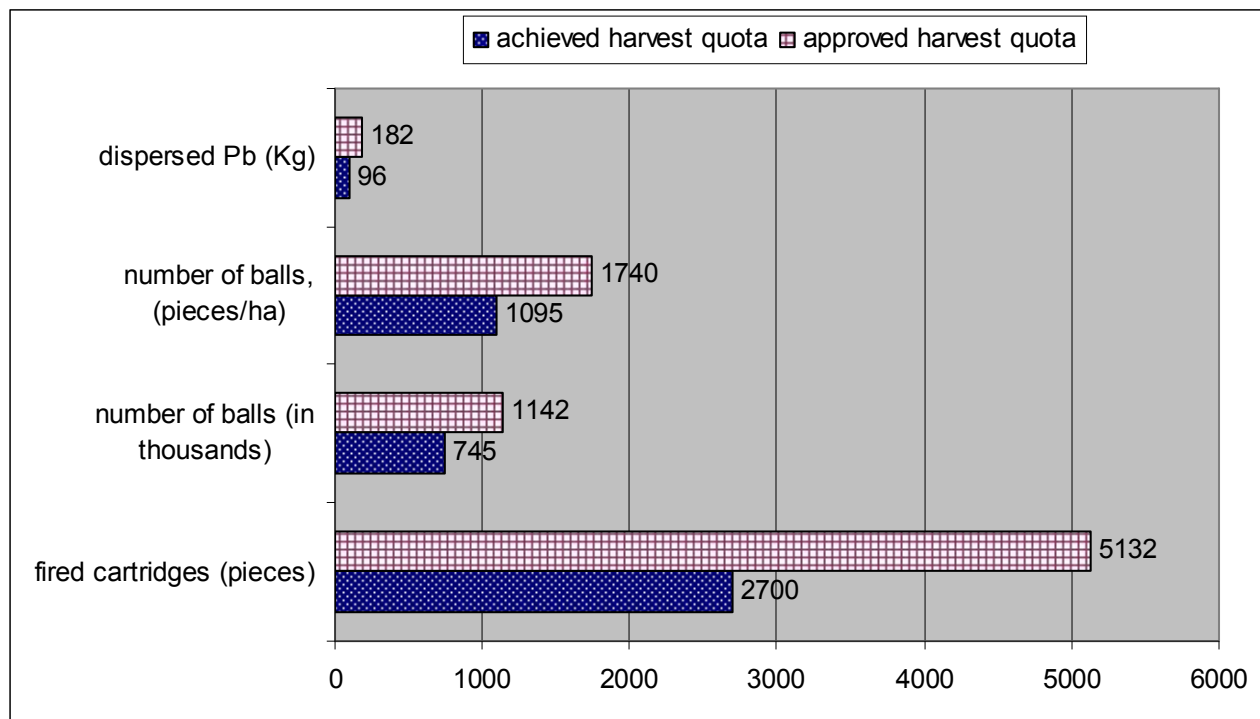


Fig.1 Situation of lead dispersed under the form of cartridges, number of shots and quantitatively for the approved/achieved harvest quota

The amount of dispersed Pb is a small one due to the reduced number of hunters and the small number of shots fired by them. The total number of balls seems to be high but the situation worsens when their density per unit area is a big one and there is the risk as the waterfowl to swallow these balls of lead. In the present case, the achieved results are reassuring: for the 500 ha of water surface, channels, water streams, there are approximately 330 balls / ha., with a maximum of 636 balls/ha in case the approved quota would have been achieved, respectively 0.08-0.19 kg Pb/ha.

A dramatic situation could be in the following case: the 68 hunters come in the approved five months of approx. 20-30 times for hunting waterfowl and fire 25-50 cartridges per day every time. The amount of Pb dispersed in the area would be of approx. : 1,2 – 3,6 tonnes of Pb. If we restrict the area to a lake of several hectares, it will result tens or even hundreds of kilograms of Pb "thrown" in that lake.

To compare the results of the study, the situation of the hunting lead in the US and Europe is shown.

The usage of lead shots was banned in case of the waterfowl hunting in the United States in the 90s.

In 2013, California state has banned all types of lead-based ammunition and established a transitional technological period until 2019.

In America, the lead bullets have been banned first in the National Parks and the non-toxic ones (made of a tough alloy made of copper + zinc) emerged in 1974 from the American company Barnes (Tălpeanu, 2012).

In Europe, lead is prohibited in the wetlands in England, Denmark, Finland, The Netherlands, Belgium, Norway, Sweden, France and Germany since 2000.

In England bismuth is used but its cost is 4 times higher than the lead. On September 1, a law 1999 came into force banning the use of ammunition containing lead in more than 250 places of special scientific interest and in the maritime area mostly.

Mateo et al. in 2014 (source: ScienceDaily) present that lead shot was forbidden in 2001 in Spanish wetlands on the Ramsar List of these areas of international importance. Ten years later, this prohibition -and the consequent use of steel shot by hunters- has started to bear fruit, according to a report in the journal Environment International.

This study has allowed the assessment of the effectiveness of the measures adopted by countries signing the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA). At the last AEWA meeting, the parties were asked to assess the effectiveness of the lead shot prohibition in wetlands



and of the changeover to non-toxic alternative munitions.

The AEWa is an agreement to protect waterfowl along their entire migration route between Africa and Eurasia. It was signed by some 30 European countries.

In Romania, Professor and Director General Neculai Selaru organized two workshops, namely: "Non-toxic shots" under AEWa in Bucharest and Tulcea in 2001 and "European legislation" under the CFE in Bucharest - Romania in 2005. Thus it was concluded that, for the Romanian hunters, the use of non-toxic ammunition would also involve the change of at least 70% of the hunting weapons in the country. Besides the high cost of weapons of this kind, it is also considered the low efficiency of the nontoxic shots with respect to the lead shots. Selaru declared that Romania is concerned as in the future to join such a system but correlated with the financial possibilities of our hunters.

On 11 APRIL 2014, in SWEDEN, the FACE members (The European Federation of Associations for

Hunting & Conservation) established that the situation regarding the phasing out of lead shot in wetlands within the EU (source: www.face.eu):

1 Member State, Denmark has a ban on the use and trade of lead shot,

2 Member States, the Netherlands, plus the Flemish region of Belgium have banned all use of lead shot for hunting and sport shooting,

14 Member States (BG, CY, CZ, DE, HU, IT, ES, FI, FR, GR, LV, PT, SE, UK) have banned lead shot either on wetlands or for waterfowl hunting,

4 Member States (AT, EE, LU, SK) ban on the use the near future,

4 Member States (IE, LT, **Romania**, SI) discussions are underway,

3 Member States (HR, MT, PL) have no ban on lead shot.

As regards the alternative ammunition, the table below shows some aspects of possible materials that can be used to produce shots, with their advantages and disadvantages.

Table 5. Characteristics of alternative ammunition

Material	Density	Hardness	Sphericity	Toxicity	Price	Availability
Bismuth	Good	Satisfactory	Average -unsatisfactory	Zero	Very expensive	Limited
Tin	Poor	Satisfactory	Average	Zero	Expensive	Good
Oțel/ steel	Poor	High	Excellent	Zero	Average	Good
Plumb/lead	Good	Satisfactory	Good- Average	High	Average	Good
Zinc/zinc	Poor	Satisfactory	Average	Low	Expensive	Good

In the past decade new alternatives to lead have been created, mainly mixtures of bismuth, tin tungsten, and various polymers.

The first attempts with steel shots dates from 1949 (MAC, 2012). The steel shots, being not toxic, do not endanger the environment or game waterfowls. Lead is toxic, does not degrade over time and can sicken the game that swallows it.

Steel shots are a little bit more expensive than those of lead. But in a few years the situation could reverse because according to some international bodies (ro.wikipedia.org) there are currently used about 8 kg of lead per capita worldwide. It is estimated that the lead ores will be exhausted in 42 years, and if we consider a production increase of 2% per year each year, they may run out in just 18 years, fact which leads us to consider recycling.

Among the companies which are currently selling non-toxic hunting bullets, the following can be

mentioned: European firms like RWS, Norma, Blaser, Sellier & Bellot, and U.S companies like Barnes, Hornady, Federal and Remington (Tâlpeanu. 2015).

CONCLUSIONS

In Bihor County, the hunting stock no.29 Cefa is representative from the assessed standpoint (waterfowl, large number of hunters). For now, the situation is not alarming yet compared to other states, the number of hunters, respectively of shootings being quite small. But the number of hunters is increasing annually (also because of the foreign hunters) and the negative effects must be kept under control.

The Nordic countries have banned the lead hunting in the wetlands.

The alternative ammunition, although it is more expensive, it is sometimes adopted by some states.



Although they seem now as minor problems for Romania, due to the increasing number of hunters, we have to control these aspects (depending on the specifics of each area) which in France create conflicting situations.

As pointed out during the Congress of the representatives of amateur and sport hunters and fishermen in Romania - Sibiu. May 30, 2015 - "...through the Treaty of Lisbon, all EU member countries must protect nature, fish, game, generally the natural environment, which the human health depends on."

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