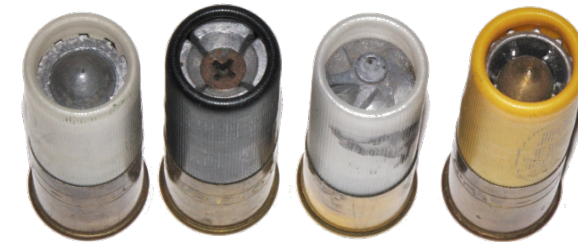


SIMPOSIO "AQUILA - REALE - STELVIO"

La continua ricerca nel Parco Nazionale sull'enigmatica Aquila reale

17 MARZO 2019 - Centro Visitatori del Parco Nazionale dello Stelvio

Piazza Forba, 4 - VALFURVA Loc. SANT'ANTONIO



DAGLI UCCELLI DA PREDAL AL NOSTRO PORTAFOGLI

*quanto ci costa l'uso del
piombo nelle munizioni
da caccia?*



Alessandro Andreotti

Riccardo Nardelli



Foto: Fabrizio Borghesi

Problematica nota per le zone umide
dagli anni '30 del secolo scorso

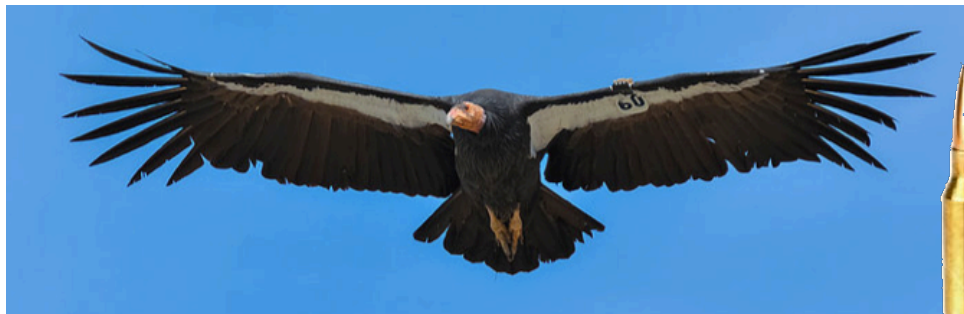


Foto: Massimo Piacentino



<https://www.desertusa.com>

<https://www.joshuaasel.com>



<https://www.worldatlas.com>



Anni '80 del secolo scorso:
prime evidenze degli effetti
sugli uccelli da preda

Uccelli come sentinelle ambientali



Foto: Stefano Pesaro

Il piombo delle munizioni da caccia è fonte di:

- inquinamento dei terreni
- inquinamento della falda
- contaminazione di numerosi organismi
- contaminazione di alimenti
- rischi sanitari per l'uomo



Foto: Massimo Piacentino



Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Restriction proposal on lead in shot used in wetlands, on the basis of Article 69(1) of the REACH Regulation .

Dossier approvato da ECHA

<https://echa.europa.eu/documents/10162/b092e670-3266-fb5d-6296-544eaccb5d4a>

Restrizione tuttora in fase di approvazione dall'Unione Europea

Costs implied by the central-case scenario		Benefits of the proposed restriction	
Annuitised one-off costs		Use value	
Replacement of guns	€6.3m	Avoided opportunity cost associated with the annual mortality of approximately 700 000 waterfowl from 16 wetland bird species known to ingest lead shot.	€105m
Testing of guns	€1.3m	Avoided opportunity cost associated with the annual mortality of other waterbirds, predators and scavengers.	non-quantified
Annual operational costs		Beneficial impacts on leisure activities including bird watching	non-quantified
Switching to alternative cartridges	€68.6m	Avoided human health impacts through consumption of contaminated game meat and/or potential consumption of contaminated (ground) water.	non-quantified
Total annual cost to hunters	€76.2m	Non-use values	
Distributional cost in terms of generated tax revenues assuming an average VAT rate of 20%	€15.2m	Protection of wildlife and ecosystem services	non-quantified
Distributional cost in terms of producer surplus gains (after VAT deduction)	Up to €25m	Existence value	
		Protection of rare bird species	non-quantified
		Cascading effects on birds of prey and predators feeding on waterfowl	non-quantified
Total societal cost	€35-61m	Total societal benefit	>€105m



Contents lists available at [ScienceDirect](#)

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



Economic assessment of wild bird mortality induced by the use of lead gunshot in European wetlands



Alessandro Andreotti ^{a,*}, Vittorio Guberti ^a, Riccardo Nardelli ^a, Simone Pirrello ^a, Lorenzo Serra ^a, Stefano Volponi ^a, Rhys E. Green ^{b,c}

^a *ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale, Via Ca' Fornacetta 9, 40064 Ozzano Emilia, Italy*

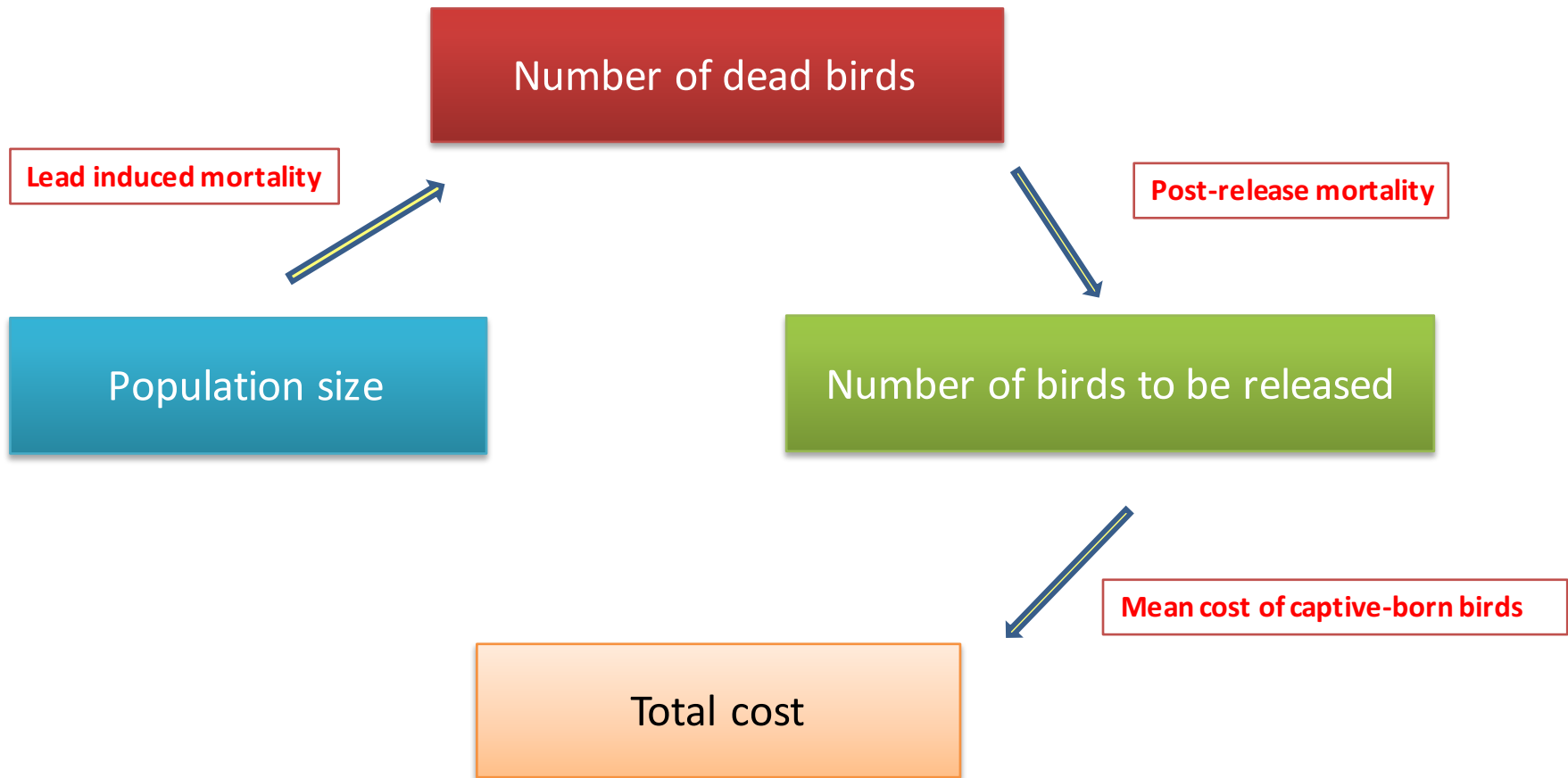
^b *Conservation Science Group, Department of Zoology, University of Cambridge, David Attenborough Building, Pembroke Street, Cambridge, CB2 3QZ, UK*

^c *RSPB Centre for Conservation Science, Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire, SG19 2DL, UK*



Foto: Massimo Piacentino

REPLACEMENT COSTS



$$\text{Mortality (\%)} = \sum_{i=1}^7 d_i = \frac{p_i}{h_i} \cdot t \frac{m_i}{100}$$

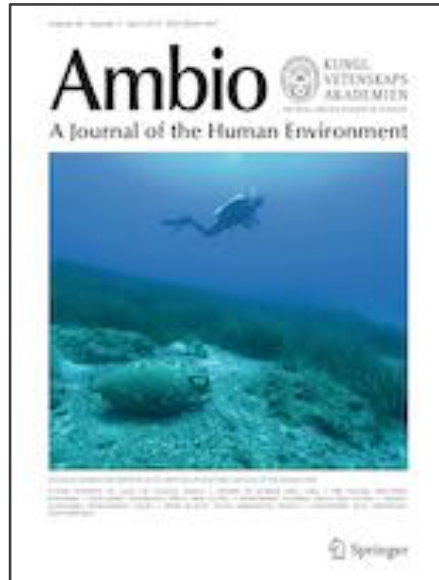
d = % dead birds for lead poisoning
h = hunting bias correction factor
t = turnover correction factor
m = mortality

Species	Lead shot ingestion prevalence % (n ^a)	Estimated mortality %	Estimated individuals suffering sub-lethal effects %	Wintering population in Europe n	Wintering population in the EU n	Estimated mortality in Europe n	Estimated mortality in the EU n	Estimated individuals suffering sub-lethal effects in Europe n	Estimated individuals suffering sub-lethal effects in the EU n
Tundra swan	0.2 (516)	0.2	0.8	22,400	22,000	45	44	179	176
Barnacle goose	0.0 (61)	0.0	0.0	718,500	718,500	0	0	0	0
Greylag goose	4.4 (203)	4.5	13.5	1,002,500	956,700	45,113	43,052	135,338	129,155
Pink-footed goose	2.7 (73)	2.8	8.2	422,500	422,500	11,830	11,830	34,645	34,645
G. white-fronted goose	0.0 (30)	0.0	0.0	1,960,000	1,866,750	0	0	0	0
Common goldeneye	16.0 (156)	16.2	48.8	440,000	376,250	71,280	60,953	214,720	183,610
Red-crested pochard	12.4 (97)	12.5	37.5	374,000	46,705	46,750	5838	140,250	17,514
Common pochard	23.1 (2333)	23.4	70.6	241,500	112,200	56,511	26,255	170,499	79,213
Tufted duck	10.5 (4208)	10.6	32.4	1,545,000	1,222,500	163,770	129,585	500,580	396,090
Greater scaup	0.0 (11)	0.0	0.0	218,500	213,514	0	0	0	0
Northern shoveler	10.4 (1515)	10.5	31.5	324,000	260,160	34,020	27,317	102,060	81,950
Gadwall	3.8 (816)	3.8	11.2	209,000	169,175	7942	6429	23,408	18,948
Eurasian wigeon	2.1 (1518)	2.1	6.9	2,295,000	2,087,000	48,195	43,827	158,355	144,003
Mallard	11.9 (20,927)	12.1	36.9	3,730,000	2,355,000	451,330	284,955	1,376,370	868,995
Northern pintail	31.5 (977)	31.9	96.1	160,000	130,610	51,040	41,665	153,760	125,516
Common teal	4.7 (43,069)	4.7	14.3	1,115,000	939,000	52,405	44,133	159,445	134,277
Total				14,777,900	11,898,564	1,040,230	725,881	3,169,609	2,214,092

^a n represents the number of examined specimens.

BIRDS TO BE RELEASED AND THEIR COST

Species	Captive-bred birds to release annually (n)		Estimated costs (euros)	
	In Europe	In the EU	In Europe	In the EU
Tundra swan	164	161	74,010	72,689
Pink-footed goose	43,333	43,333	3,163,333	3,163,333
G. white-fronted goose	0	0	0	0
Greylag goose	165,247	157,698	6,940,385	6,623,308
Barnacle goose	0	0	0	0
Eurasian wigeon	176,538	160,538	8,120,769	7,384,769
Gadwall	29,092	23,548	1,309,121	1,059,668
Common teal	191,960	161,659	9,022,106	7,597,989
Mallard	1,653,223	1,043,791	29,758,022	18,788,242
Northern pintail	186,960	152,618	10,843,663	8,851,818
Northern shoveler	124,615	100,062	6,729,231	5,403,323
Red-crested pochard	171,245	21,385	6,678,571	834,018
Common pochard	207,000	96,171	9,729,000	4,520,057
Tufted duck	599,890	474,670	26,995,055	21,360,165
Greater scaup	0	0	0	0
Common goldeneye	261,099	223,269	22,976,703	19,647,692
Totals	3,810,367	2,658,905	142,339,970	105,307,070




[Ambio](#)

pp 1–20 | [Cite as](#)

Wildlife, human and environmental costs of using lead ammunition: An economic review and analysis

Authors

[Authors and affiliations](#)

Deborah J. Pain , Ian Dickie, Rhys E. Green, Niels Kanstrup, Ruth Cromie

[Open Access](#) | [Lead Use in Hunting](#)

First Online: 16 March 2019

310

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Abstract

A proposed European Union (EU)-wide restriction on the use of lead gunshot for shooting in and over wetlands estimated that the societal benefits of a restriction outweighed costs, despite few identified benefits being quantified economically. A subsequent Annex XV Investigation Report on the evidence of impacts of lead ammunition in terrestrial environments concluded that additional measures to control its use are warranted, although to date this has not been further evaluated. To help inform this process, we review the literature and undertake new analyses to estimate the costs of continued use of lead ammunition associated with impacts on wildlife, people and the environment. We estimate minimum annual direct costs across the EU and Europe of c. €383 million–€960 million and €444 million–€1.3 thousand million respectively.



Quanto ci costa in Europa l'uso del piombo nelle munizioni da caccia?

Costi legati all'impatto sulla fauna

a. Restocking 16 specie di uccelli acquatici	105 ML €	142 ML €
b. Restocking 4 specie di rapaci attraverso il rilascio di uccelli allevati	25-457 ML €	37-750 ML €
b. Restocking di galliformi rilasciati per la caccia	>3,4 ML €	>3,4 ML €
c. Cura uccelli acquatici avvelenati	28 ML €	40 ML €

161,4-593,4 ML € 222,4-935,4 ML €



Table 2 Estimated replacement costs of selected raptor species killed by lead poisoning from ammunition sources in the European Union and throughout Europe

Species	Population (pairs) EU; Europe ^a	Annual adult survival ^b	Numbers of adults (individuals) estimated to die annually EU; Europe	Percentage of mortality estimated from lead poisoning ^c	Numbers of adults estimated to die annually from lead poisoning EU; Europe	Replacement cost (€48 108 per adult) EU; Europe	Replacement cost (€661 284 per adult) EU; Europe	References
White-tailed eagle	4202; 10 650	0.90–0.95	420–840; 1066–2130	22	92–184; 234–468	€4.4–8.9 million; €11.3–22.5 million	€61.1–122.3 million; €154.9–309.9 million	Isomursu et al. (2018) [Finland], Krone et al. (2009) [Germany], Nadjafzadeh et al. (2013) [Germany], Helander et al. (2009) [Sweden]
Golden eagle	5300; 10 800	0.87	1378; 2808	5–10	69–138; 140–281	€3.3–6.6 million; €6.8–13.5 million	€45.6–91.1 million; €92.8–185.7 million	Ganz et al. (2018) [Swiss Alps], Ecke et al. (2017) [Sweden], Russel and Franson (2014) [USA], Langner et al. (2015) [USA]
Griffon vulture	32 350; 33 400	0.97 (released—long-term estimate)	1941; 2004	2.5	49; 50	€2.3 million; €2.4 million	€32.1 million; €33.1 million	Berny et al. (2015) [French Pyrenees]
Red kite <i>Milvus milvus</i>	27 950; 29 300	0.92 (3rd year in absence of illegal killing)	4472; 4688	7.15	320; 335	€15.4 million; €16.1 million	€211.4 million; €221.7 million	Molenaar et al. (2017) [England], Berny et al. (2015) [French Pyrenees]
Total—EU; Europe					530–691; 760–1135	€25.4–33.2 million; €36.6–54.5 million	€350.2–456.9 million; €502.5–750.4 million	



Quanto ci costa in Europa l'uso del piombo nelle munizioni da caccia?

Costi legati all'impatto sull'uomo

a. Riduzione del quoziente
intellettivo nei bambini

40-104 ML €

> 40-104 ML €

b. Altri costi sanitari per gli adulti

40-104 ML €

> 40-104 ML €



Quanto ci costa in Europa l'uso del piombo nelle munizioni da caccia?

Costi legati all'impatto sull'ambiente

a. Costi per il risanamento
ambientale dei poligoni di tiro

81-162 ML €

> 81-162 ML €

b. Costi per il risanamento
ambientale delle aree più
inquinare (appostamenti
di caccia)

100 ML €

> 100 ML €

181-262 ML €

> 181-262 ML €



Quanto ci costa in Europa l'uso del piombo nelle munizioni da caccia?

Altri costi

- a. Sorveglianza e ricerca
- b. Rispetto delle norme vigenti
- c. Collisioni con linee elettriche
- d. Contaminazione di cibi
- e. Avvelenamento dei cani

1 ML

>1 ML €

1 ML €

>1 ML €



Quanto ci costa in Europa l'uso del piombo nelle munizioni da caccia?

Totali

a. Impatto sulla fauna	161,4-593,4 ML €	222,4-935,4 ML €
b. Impatto sull'uomo	40-104 ML €	> 40-104 ML €
c. Impatto sull'ambiente	181-262 ML €	> 181-262 ML €
d. Altri impatti	1 ML €	>1 ML €

383,4-960,4 ML >444,4-1,132,4 ML €

L'impatto sulla salute in Italia



Food Additives & Contaminants: Part A

ISSN: 1944-0049 (Print) 1944-0057 (Online) Journal homepage: <http://www.tandfonline.com/loi/tfac20>

Wild game consumption habits among Italian shooters: relevance for intakes of cadmium, perfluorooctanesulphonic acid, and ¹³⁷cesium as priority contaminants

Mauro Ferri, Loredana Baldi, Stefania Cavallo, Roberta Pellicanò & Gianfranco Brambilla

Numero di cacciatori (2007): 751,876

Il consumo regolare di carne di selvaggina è esteso anche ai familiari nell'**83%** dei casi per gli uccelli e nel **60%** per i mammiferi

Nucleo familiare medio (cacciatore incluso): **3**

Persone che consumano uccelli selvatici: **2.000.000**

Persone che consumano mammiferi selvatici: **1.650.000**

Percentuale della popolazione italiana sotto gli 8 anni: **7,6%** (fonte: ISTAT)

150.000 bambini a rischio in Italia

**vs. 83.000
stimati in Europa**

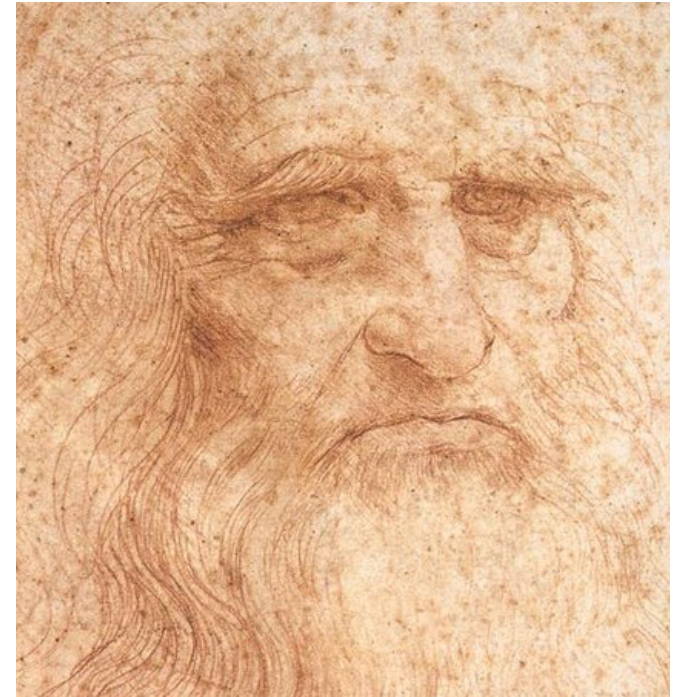
Quanto vale la perdita dell'intelligenza?

Riduzione del guadagno per ogni punto di QI perso: da 3.882 a 10.000 € nel corso della vita

582-1.500 ML € in Italia

72-187 ML € annualizzati

vs. 40-104 ML € stimati in Europa



Valutazione di minima, che considera solo un aspetto marginale legato alla perdita di intelligenza!

L'inquinamento dei terreni in Italia

Provincia di Brescia (2005)

appostamenti fissi: **5.139**

uccelli abbattuti: **1.137.495**

$$\sum_i DL_i = \frac{NK_i \cdot c_i \cdot W_i}{1000}$$

piombo disperso: **40-60 t/anno**

piombo per
appostamento fisso: **5-6 kg/anno**

<http://www.isprambiente.it/it>



ISPRA
Istituto Superiore per la Protezione
e la Ricerca Ambientale

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

**Il piombo nelle munizioni
da caccia: problematiche
e possibili soluzioni**

RAPPORTI

158 / 2012

Quanto costa il disinquinamento dei terreni?

Durata media di attività di un appostamento: **50 anni**

Piombo per appostamento: **250-300 kg**

Costo (stimato) per bonifica: **10.000 €/appostamento**

Costo complessivo per la sola provincia di Brescia: **50 ML €**

vs. 100.000 ML € stimati in Europa

Numero di appostamenti fissi in Lombardia (2012): 13.017
(dato tratto dal Piano Faunistico regionale)



BONIFICA TERRENI [Login / Register](#)

[Login / Register](#) / [f](#) [t](#) [in](#) [g+](#)

RICHIEDI PREVENTIVO

Nome Cognome *	<input type="text"/>
Email *	<input type="text"/>
Telefono	<input type="text"/>
Scrivi richiesta *	<input type="text"/>
Quale è la somma di: *	<input type="text" value="6 + 9"/>

INVIA

VIVA LE MUNIZIONI LEAD- FREE!!!



Grazie per l'attenzione...
