Environment Canada
Canadian Wildlife Service

Environnement Canada
Service canadien de la faune

Science Background On Toxicity Of Lead Shotshell Ammunition

Lead Poisoning In Waterfowl

Lead shot ingestion has been reported in waterfowl since the late 1800's. Lead in the form of lead shot, is a toxic substance, estimated to kill some 250,000 waterfowl each year in Canada and poison millions more. Lead poisoning of waterfowl from ingestion of lead shot has been reported in at least 16 countries including Canada, the United States, Mexico, Great Britain, Norway, Sweden, Finland, Denmark, and Australia. Ten countries currently prohibit the use of lead shot for waterfowl hunting nationally or within zones.

Gizzard surveys from over 21,000 dabbling ducks from Canadian provinces (excluding Newfoundland) determined that lead shot ingestion occurred in all surveyed areas. Highest ingestion rates in dabblers were reported in British Columbia and the maritime provinces, whereas the lowest rates were from Alberta. A survey of lead concentrations in wing bones of over 8,000 young-of-the-year mallard and black ducks revealed a geographical pattern of elevated lead exposure consistent with that found from gizzard surveys. Further research using stable lead isotopic analysis concluded that high lead exposure in waterfowl and their predators is consistent with lead shot ingestion, and is not consistent with exposure to other forms of environmental lead, such as lead from past gasoline combustion.

Secondary Lead Poisoning Of Eagles

Many eagles and other predatory or scavenging birds also suffer lead poisoning by consuming lead shot embedded in tissues of game animals killed or wounded with lead ammunition. Where it has been explicitly studied in Canada, secondary lead poisoning of bald and golden eagles accounts for an estimated 14 - 19 % of the recorded post-fledging mortality in individuals examined for lead exposure.

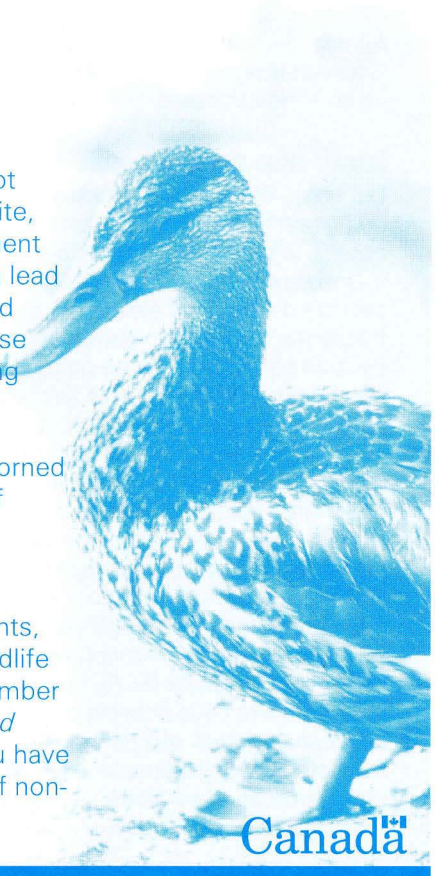
	Bald Eagles	Golden Eagles
British Columbia	19 %	-
Alberta, Saskatchewan, Manitoba	18 %	14 %
New Brunswick, Nova Scotia, PEI	14 %	-

Lead Shot Poisoning In Non-Waterfowl Species

Although impacts of lead shot on upland game birds are less well documented, lead shot ingestion in dryland habitats has been documented in mourning doves, northern bobwhite, partridge, pheasant, ruffed grouse, scaled quail, wild turkey and wood pigeon. Environment Canada initiated a study after the 1995/96 hunting season to identify the sources of high lead exposure found in woodcock. These studies revealed a higher frequency of elevated lead exposure in young of the year woodcock than in dabbling ducks. The possibility that these birds ingest lead shot directly, or are exposed to soil and food chain lead from weathering of lead shot pellets deposited in the bird's environment, cannot presently be ruled out.

Although secondary lead poisoning in upland game bird predators has not been thoroughly investigated, CWS has documented a few cases of lead poisoning in great horned owls and eagles that are not associated with waterfowl consumption. Documentation of embedded shot in game animals other than waterfowl, such as pheasants and rabbits, suggest that predators of upland game birds are also at risk for lead shot ingestion and poisoning.

For more information on the effects of lead shot on wildlife and their environments, please contact Dr. A. (Tony) Scheuhammer at the Canadian Wildlife Service, National Wildlife Research Centre, Tel: (819) 997-6128. To obtain a copy of the CWS Occasional Paper Number 88, entitled, *A review of the environmental impacts of lead shotshell ammunition and lead fishing weights in Canada*, please contact CWS Publications at Tel: (819) 997-1095. If you have access to the internet, you may view this publication and other information on the use of non-toxic shot on our website at: http:www.ec.gc.ca/cws-scf/pub/hunting/nontoxic.html



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