

## **Evolution of Lead Hazard Reduction for Wildlife and Humans**

- ~2000 BC Environmental problems from lead mines first documented
- ~400 BC Hippocrates accurately describes the symptoms of lead poisoning
- 476 AD Roman Empire collapses; lead use in water pipes, cosmetics, pottery, and food suspected as major contributing factor, despite Roman knowledge of health hazards
- 1500s Lead used as poison for assassinations in renaissance Europe
- 1621 First lead mining in New World colonies, in Virginia
- 1786 Ben Franklin deplors that nothing has been done to protect people from the "mischievous effect" of lead poisoning
- 1842 Lead poisoning first identified as a disease in wild birds
- 1870s First reports of incidents of lead poisoning of waterfowl at hunting sites
- 1890s First documented mortality of waterfowl due to lead shot, information on lead hazard to wildlife published in scientific literature and the press
- 1920s Oil companies began adding tetraethyl lead to gasoline
- 1922 League of Nations bans interior lead paints
- 1930 Leading scientists report lead poisoning in waterfowl to be widespread
- 1959 Major scientific study identifies spent lead shot as source of exposure and widespread hazard for waterfowl
- 1970 Clean Air Act passes – charges Environmental Protection Agency with identifying and setting standards for harmful pollutants, including lead
- 1970s Concerns about lead toxicity from fishing weights for water birds published
- 1972 First nontoxic shot use requirements for limited areas in U.S.
- 1973 EPA initiates a phase-down of lead levels in motor vehicle gasoline to reduce health risks from lead emissions
- 1980 U.S. using 1.3 million tons of lead per year, or 5,221 grams of lead per American per annum, a rate of dependence on lead nearly ten times greater than ancient Romans
- 1980 Amount of lead in gasoline drops 50% from previous decade; average human blood-lead levels in U.S. correspondingly drop 50%, levels in children drop 37%
- 1980s Numerous secondary lead poisoning cases documented in bald eagles

- 1985 Last wild California condors brought into captivity for emergency breeding program due to high risks birds face in the wild, particularly from lead poisoning
- 1986 Federal regulations initiated to phase out lead shot for waterfowl hunting
- 1986 Safe Drinking Water Act amended to require "lead-free" plumbing - EPA sets standards limiting lead concentrations in public water systems and pipes
- 1986 Britain bans use of most lead fishing sinkers to protect swans
- 1990 Clean Air Act amended to prohibit leaded gasoline in motor vehicles by 1995
- 1991 Lead shot banned for all waterfowl hunting in entire U.S.
- 1991 EPA issues regulation under the Safe Drinking Water Act to limit the amount of lead in drinking water
- 1992 Studies published on hazards of lead fishing sinkers to loons
- 1992 Lead Exposure Reduction measures pass Congress, identifying dangerous levels of lead, publishing lead hazard information, and regulating residential renovation activities and federal facilities to abate and control lead paint
- 1994 EPA proposes nationwide ban on manufacture, import, processing, and distribution of lead fishing sinkers of a size hazardous to waterfowl – but the regulations are never ratified
- 1995 EPA issues regulations banning all lead in motor vehicle gasoline
- 1995 The use of lead solder in food cans is banned under the Federal Food, Drug, and Cosmetic Act
- 1995 Percentage of U.S. children with elevated blood-lead levels has dropped from 88.2% in the 1970s to 4.4% by 1995
- 1996 Food and Drug Administration bans the use of lead foil caps on wine bottles
- 1997 Canada implements partial ban on small-sized lead fishing sinkers in national parks and national wildlife areas
- 1999 Canada issues ban on lead shot for hunting migratory game birds
- 1999 Fish and Wildlife Service proposes to expand lead-free fishing areas on national wildlife reserves, wilderness areas, and waterfowl sites – but never issues a final decision
- 2000 74 nations have implemented some sort of regulations on the use of lead shot, and 37 more nations are preparing legislation; only 4 countries have applied restrictions to the sale and use of lead fishing sinkers
- 2000 Scientific reports show significant reduction in lead exposure to waterfowl after implementation of 1991 lead shot ban

- 2000 Lead air pollution shown to have decreased 98% since 1970
- 2004 Conservation groups petition California to require non-lead ammunition for hunting in condor habitat
- 2006 Lawsuit filed against California for allowing lead ammunition to continue to poison California condors
- 2006 95% of all condors in Arizona found to have lead exposure; 70% of the Arizona flock must be taken into captivity and treated for lead poisoning
- 2007 California legislature approves the Ridley-Tree Condor Preservation Act, requiring hunters to use non-lead ammunition for hunting big game and coyotes within the California condor's range in central and southern California
- 2007 The California Fish and Game Commission approves additional hunting regulations that expand the non-lead bullet requirements to include hunting nongame birds and mammals within the condor range
- 2007 Major recall of toys from China containing lead
- 2007 Venison donated by hunters to food centers in North Dakota and Minnesota found to have high levels of lead bullet fragments, pose health risk to humans consuming venison
- 2007 Number of condor deaths in California confirmed or linked to lead poisoning rises to 15 birds
- 2008 Several studies demonstrate potential risks to humans who consume game meat harvested with lead rifle ammunition
- 2008 The California Fish and Game Commission extends protections of the Ridley-Tree Condor Conservation Act to depredation hunting, the shooting of animals deemed a nuisance or threat
- 2009 Lawsuit filed to force management plans on public lands in Arizona to include actions to protect Grand Canyon condors from toxic lead
- 2009 National Park Service announces plan to eliminate use of lead ammunition and lead fishing tackle in national parks by 2010
- 2009 EPA grants citizen petition to ban lead automobile wheel balancing weights - regulations requiring non-lead alternatives to be issued in 2011
- 2010 California passes legislation reducing amount of lead that is permissible in plumbing products used to convey or dispense drinking water
- 2010 Confirmed lead poisoning death of 15<sup>th</sup> endangered condor in Arizona since reintroduction program began in 1996, with many more deaths suspected to be from spent lead ammunition
- 2010 Conservation groups petition EPA under the Toxic Substances Control Act to ban use of all lead ammunition and all lead fishing tackle nationwide