

:Is lead a threat in the great outdoors as well as in the toy box?

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News of recalled toys coated with lead paint has raised awareness about this toxic element and its effect on human health. You may have already combed through your child's toy box to retire suspect playthings and have checked the old paint in and on your house for chipping. But have you ever wondered if lead is a threat away from your home, in New Hampshire's wild places?

Thankfully, the answer is usually no. Lead levels outside in natural areas in New Hampshire pose little threat to humans. This is thanks in large part to the elimination of lead in many manufactured products, careful management of lead contaminated areas by state and federal agencies, and the phasing out of lead in 1973 from gasoline. Banning leaded gasoline alone prevented well over 200,000 tons of lead from

entering the U.S. environment each year. Today, no fuel containing lead may be sold for on-road use.

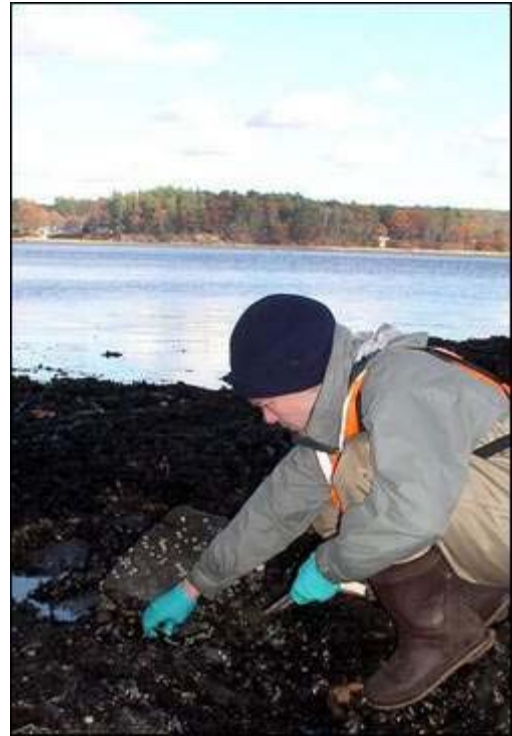
Lead does still pose a threat to wildlife, though, especially waterfowl. Starting about 100 years ago, the amount of spent lead shot from hunting began to build-up in the environment. It became so abundant that ducks, geese, swans, and other water birds ate the lead shot as they fed. Most birds will eat small rocks to aid food digestion and unfortunately lead shot looks just like small rocks. The US Fish and Wildlife Service estimated that at the height of its use, about 3,000 tons of lead shot was being discharged by U.S. hunters into the environment annually. Because of wide-spread lead poisoning of waterfowl during most of the 20th century a federal ban was enacted in 1991 on the use of lead shot in hunting.

More recently in 2000, New Hampshire became the first state to restrict the use of lead in fishing equipment. Lead fishing weights and small jigs are consumed by water birds in much the same way as lead shot. One bird in particular, the common loon, became an indicator of how bad the problem had become.

Researchers at Tufts University and the Loon Preservation Committee collected dead adult loons in the early 1990s and determined their cause of death, looking specifically for lead poisoning. Over a 10 year period, 66 (57 percent) of the 116 dead loons tested died from lead ingestion. Testing since the lead fishing equipment ban was implemented suggests that the loon death rate due to lead is decreasing, with 2006 rates being about 43 percent.

Even with the lead bans in place for fishing and hunting equipment and gasoline, lead still makes its way into New Hampshire's rivers and estuaries. In some areas with long histories of industrial activity, lead levels in sediments and surrounding soils can be high and lead will slowly leach into the surrounding water and affect aquatic creatures living in the area. One location that has such a condition is North Mill Pond in Portsmouth. Samples of blue mussels (*Mytilus edulis*) taken next to the Maplewood Avenue bridge indicate elevated levels of lead; however, these levels do not exceed U. S. Food and Drug Administrations FDA limits.

The monitoring effort that revealed the elevated levels of lead at North Mill Pond is part of a larger program in the region called Gulfwatch. Expanded to additional sites in New Hampshire's coastal waters by the New Hampshire Estuaries Project, Gulfwatch is a long-term program designed to monitor contaminants in coastal and estuarine waters that are part of the Gulf of Maine. To measure contaminant levels, scientists analyze tissues from species of plants or animals that are sensitive to a wide range of contaminants. These organisms are called indicator species and the one of choice to monitor contaminants in coastal waters is the blue mussel. These common shellfish of the intertidal zone filter large volumes of water during feeding, and thus readily incorporate water-borne and particulate contaminants, such as lead, into their tissues. Therefore, analysis of their tissues gives an integrated picture of contaminant levels in the water over time. For 17 years Gulfwatch researchers and volunteers have collected mussels for contaminant analysis at 57 locations, including 12 in New Hampshire's estuaries. It is one of the few long-term contaminant monitoring programs in the region and the only one to be coordinated with Canada.



Courtesy photo New Hampshire Estuaries Project coordinator Jodi Castallo collects mussels for analysis at Hilton Park in Dover.

Gulfwatch findings for all of New Hampshire estuaries are reported in the 2006 State of the Estuaries Report, which indicates that several toxic contaminants (including lead but also PCBs, and DDT) in the water and sediments of Great Bay and Hampton-Seabrook Estuaries are at levels of minimal concern and have actually decreased by 17 to 68 percent over the past 12 years.

Thanks to researchers who monitor lead levels in the environment and regulators who work to remove and contain contaminants, lead is not a significant concern for most people who are enjoying New Hampshire outdoors. Toy boxes, on the other hand, are another story.

Eye on our Estuaries is an educational column initiated by the New Hampshire Estuaries Project (NHEP) about coastal watershed issues. The NHEP is a collaborative program involving governmental agencies, universities, nonprofit organizations, businesses and the public to protect, enhance and monitor the environmental quality of the state's coastal bays and rivers. NHEP is funded in part by a grant from the U.S. Environmental Protection Agency. For details, visit www.nhep.unh.edu
