USGS

Patuxent Science Meeting 2004 Poster Abstract

Phosphorus amendment reduces bioavailability of lead to mallards

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Lead poisoning of waterfowl has been reported for decades in the Coeur d'Alene River Basin in Idaho as a result of the ingestion of lead-contaminated sediments. We conducted a study to determine whether the addition of phosphoric acid to sediments would reduce the bioavailability of lead to mallards (Anas platyrhynchos). When sediments were amended with 1% phosphorus under laboratory conditions, and diets containing 12% amended sediment were fed to mallards, reductions in tissue lead were 43% in blood, 41% in liver, and 59% in kidney with sediment containing about 4,520 µg/g lead on a dry-weight basis and 41%, 30%, and 57% with sediment containing about 6,990 µg/g lead. Although the phosphorus amendment substantially reduced the bioavailability of lead, lead concentrations in the tissues of mallards fed the amended sediments were still above those believed to be harmful to waterfowl. The addition of phosphoric acid as we used it might only significantly benefit waterfowl where sediments or soils contain less than 1,000-2,000 µg/g lead.