

Songbirds: Monitoring Mercury in Invertivores

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Monitoring Mercury in Invertivores: Songbirds

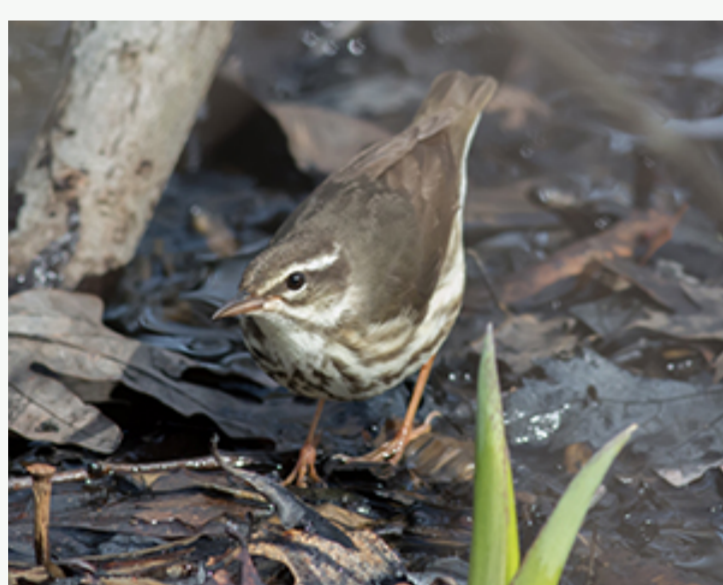
Recent studies have shown that insect-eating birds and bats can bioaccumulate high amounts of mercury in their bodies and therefore are good bioindicators of mercury contamination. During their summer breeding season, many birds rely on insects and other invertebrates (e.g., spiders) as food for their young.

Invertebrates that spend some of their early developmental stages in aquatic ecosystems are a particularly important link to the aquatic ecosystems most affected by mercury pollution.



What We Found

BRI scientists initially discovered the potential for mercury exposure in songbirds when conducting a risk assessment of a U.S. Environmental Protection Agency Superfund Site on the Sudbury River in Massachusetts. There, invertebrate-eating birds (i.e. Red-winged Blackbirds) were found to have blood mercury concentrations four times higher than associated fish-eating birds (e.g. the Belted Kingfisher).



Significance

Such findings led to a paradigm shift in how governmental agencies assessed the risk and injury of mercury contamination in ecosystems. The potential risk mercury poses to wildlife was no longer considered a problem for fish-eating wildlife alone, but also for wildlife feeding on invertebrates.



Continuing Studies

Since that initial study on the Sudbury River, BRI has captured, sampled, and analyzed more than 10,000 songbirds for mercury concentrations, mostly using blood and feather tissues. These data provide critical information on species sensitivity, as well as geographic areas and habitats of greatest concern.

Published findings indicate wetland songbirds are at greatest risk, especially species that are mostly invertivores during the breeding season and that forage by gleaning invertebrates from vegetation. Species of greatest concern in the northeastern United States include the Carolina Wren; Northern and Louisiana Waterthrushes; Rusty and Red-winged Blackbirds; and Nelson's, Saltmarsh, and Seaside Sparrows.



USING MUSEUM BIRD SKINS TO TRACK MERCURY

Methylmercury is naturally bound in the feathers of birds. Therefore, analyzing methylmercury in the feathers of bird skins from museum specimens offers a novel way to determine the change in environmental mercury loads over time, often as far back as the late 1800s.

BRI conducts this historical analysis with the Harvard Museum of Natural History, the Natural History Museum of New York, and the University of Michigan Museum of Natural History. Species in which mercury may be causing significant population level declines over the past few decades include the Olive-sided Flycatcher and the Rusty Blackbird.

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ADDRESS

Biodiversity Research Institute
276 Canco Road, Portland, ME 04103
Phone: 207-839-7600 Fax: 207-887-7164
Email: bri@briloon.org