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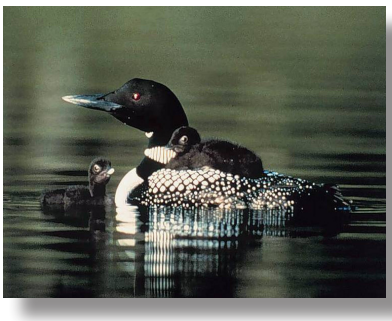
Patuxent Wildlife Research Center

Effects of Mercury on Birds

- ***The Challenge:*** Mercury is one of the most pervasive and toxic of all environmental contaminants. Because mercury is an element, once it is released into habitats occupied by birds and other wildlife it does not break down, but instead becomes a permanent part of the global environment. One of the most insidious aspects of mercury pollution is that all forms of mercury, whether in its liquid, elemental form or in various compounds, can be biologically transformed into the most toxic form, methylmercury. Methylmercury has been shown to be extremely hazardous to humans and wildlife. Birds seem to be especially sensitive to methylmercury, and with birds the embryonic life stage is the most vulnerable.

- ***The Science:*** The most important questions about the hazards of mercury to birds were related to its harmful effects on reproduction, but the difficulty was that the two most common ways to examine reproductive affects in wild birds (field studies in mercury contaminated areas, or controlled feeding studies in captivity) are time consuming and expensive. Therefore, a new approach was adopted, one that would make it possible to test the relative sensitivity of many wild birds to the embryo toxicity of methylmercury. Eggs from wild birds were collected in nature and brought back to the lab where they were injected with various doses of methylmercury, and the survival of embryos was measured.



- ***The Future:*** Eggs from 26 different species of birds were injected with methylmercury. Some species, such as the American kestrel, osprey, and snowy egret were very sensitive to methylmercury, whereas other species, such as the lesser scaup, Canada goose, and double-crested cormorant, were much less sensitive. One of the surprising findings was that the mallard was less sensitive than nearly all of the other species tested. This finding was especially important because the results from controlled feeding studies with mallards have been used for decades to establish a threshold for how much mercury in eggs causes embryo mortality and teratogenic effects. It now appears that the threshold that applies to mallards may be insufficient to protect other species -- a finding that suggests other species need to be tested in controlled feeding studies or in rigorous field studies.

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