



Contaminant Exposure and Potential Effects on Reproduction of Ospreys Nesting in Chesapeake Bay Regions of Concern

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Statement of Problem: Environmental contaminants have historically posed a serious threat to waterbirds in Chesapeake Bay. With the banning of the most toxic chemicals, populations of many affected species have recovered and are expanding into some of the most polluted portions of the Bay. The hazard of contaminants in these regions of concern to waterbirds remains largely unknown.

Objectives: The objective of this study is to assess exposure to traditional and new emerging contaminants, and examine potential effects of contaminants on reproduction of ospreys nesting in Chesapeake Bay “Regions of Concern”.

Approach: This is a cooperative project with staff of the Chesapeake Bay Field Office of the Fish and Wildlife Service that will assess contaminant exposure and potential adverse effects on ospreys nesting on navigation markers and other fixed structures within the Chesapeake Bay. The study is being conducted in three Regions of Concern (Anacostia River, Baltimore Harbor, and the Elizabeth River), and at the South, West and Rhode Rivers near Annapolis, Maryland (presumed reference site). From each nest, a single egg will be collected and analyzed for organochlorine pesticides, total PCBs, PCB congeners, mercury, alkylphenols and ethoxylates, brominated diphenyl ethers, and perfluorinated compounds. Blood and feather samples from near fledging young will be collected and analyzed for heavy metals, metalloids and trace element analysis. Nest success (hatching of eggs, and fledging of young) and growth rate of nestlings will be monitored at frequent intervals to determine potential relationships between contaminant exposure and reproductive success.

Selected Reports and Other Products:

B.A. Rattner, P.C. McGowan, N.H. Golden, J.S. Hatfield, P.C. Toschik, R.F. Lukei Jr., R.C. Hale, I. Schmitz-Afonso, and C.P. Rice, 2004, Contaminant exposure and reproductive

success of ospreys (*Pandion haliaetus*) nesting in Chesapeake Bay regions of concern: Archives of Environmental Toxicology and Chemistry, v. 47, p. 126-140.

Contaminant Exposure and Potential Effects on Reproduction of Ospreys (*Pandion haliaetus*) Nesting in Chesapeake Bay Regions of Concern, 2003, Patuxent Wildlife Research Center Science Brief for Research Managers 2003-03.

Schmitz-Afonso, I., J.E. Loyo-Rosales, M. de la Paz Avilés, B.A. Rattner and C. P. Rice, 2003, Determination of alkylphenol and alkylphenol ethoxylates in biota by liquid chromatography with detection by tandem mass spectrometry and fluorescence spectroscopy: Journal of Chromatography A, v. 1010, no. 1, p. 25-35.

Toschik, P.C., B.A. Rattner, P.C. McGowan, N.H. Golden, R.F. Lukei, R C. Hale and M.A. Ottinger, 2003, Environmental contaminant exposure and reproduction of ospreys on the Elizabeth River, Virginia: November 16-20, Proceedings of the Twenty-third Annual Meeting of the Society of Environmental Toxicology and Chemistry, Proceedings, P039.

Relevance and Benefits: This research projects is directly related to the following USGS Chesapeake Science Plan Goals:

1. Assess the occurrence of toxic constituents and emerging contaminants.
2. Assess the factors affecting the health of fish, wildlife, and their habitats.