



Conserving The Nature of America

Pollution Levels Declining in Waterfowl at an Eastern North Carolina Waste Site

The U.S. Fish and Wildlife Service (USFWS) and partners measured pollutants in wood duck (*Aix sponsa*) eggs collected near a North Carolina paper mill. The mill, on the Roanoke River near Plymouth, is adjacent to one of the National Wildlife Refuges we manage in the public trust. In the early 1990's we found pollution levels of concern in wood duck eggs near Roanoke River National Wildlife Refuge. In the mid-1990's, a mill modernization reduced pollutant loading to the river, so we re-assessed pollution risks to birds between 2002 and 2005.

Our investigation was completed this year with two peer-reviewed publications* in the journal *Archives of Environmental Contamination and Toxicology*. Pollutant levels in wood duck eggs near the mill were higher than at a nearby reference site. However, all contamination in eggs was less than that associated with adverse effects in birds. The study was the first to use wood duck eggs in monitoring dioxin trends over time, and there was a 5-fold decline in levels of dioxin-like compounds between 1992 and 2005.



Wood duck pair, U.S. Fish and Wildlife Service photo

- * Augspurger TP, Tillitt DE, Bursian SJ, Fitzgerald SD, Hinton DE, Di Giulio RT. 2008. Embryo toxicity of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin to the wood duck (*Aix sponsa*). *Arch Environ Contam Toxicol* 55: 659-669.

Augspurger TP, Echols KR, Peterman PH, May TW, Tillitt DE, Di Giulio RT. 2008. Accumulation of environmental contaminants in wood duck (*Aix sponsa*) eggs with emphasis on polychlorinated dibenzo-*p*-dioxins and dibenzofurans. *Arch Environ Contam Toxicol* 55: 670-682.

The lack of contamination in reference site eggs, and decline in egg contamination after process changes intended to reduce pollution at the mill, provide strong evidence that mill discharges influenced contamination of local wood duck eggs. Results indicate the wood duck is an effective sentinel for pollutant monitoring. These results were used by the USEPA in explaining the remedy selected for contaminated sediments near the mill.

Our investigation was a cooperative effort with the U.S. Geological Survey Columbia Environmental Research Center, North Carolina Zoological Society, Sylvan Heights Waterfowl, Michigan State University, and Duke University. Copies of the papers can be obtained from the USFWS. For more information, contact Tom Augspurger, USFWS, Raleigh, NC (919/856-4520 x.21 or tom_augspurger@fws.gov).

Pollution is one of the public's greatest environmental concerns. The USFWS has been involved with studying contaminant effects on fish and wildlife since its earliest days, and today our Environmental Contaminants Program includes contaminants specialists at more than 75 locations around the country.