



MAY 2009

FISH TOXICITY PILOT STUDY FOR THE HUDSON RIVER NRDA

HUDSON RIVER NATURAL RESOURCE DAMAGE ASSESSMENT

Past and continuing discharges of polychlorinated biphenyls (PCBs) have contaminated Hudson River natural resources. While the U.S. Environmental Protection Agency is continuing with cleanup plans, federal and state trustee agencies – the U.S. Department of Commerce, the U.S. Department of the Interior, and New York State – are conducting a natural resource damage assessment (NRDA). These agencies are responsible for evaluating the injuries associated with hazardous substance contamination to natural resources and determining appropriate actions to restore those resources. Natural resource damage payments provide a means for the Trustees to restore injured public resources to the condition they would have been in but for the release of hazardous substances to the environment, and to compensate the public for lost services provided by those resources.

The Hudson River provides habitat for over 200 species of fish, including American shad, striped bass, and Atlantic sturgeon. Many of these Hudson River fish are in direct contact with contaminated sediment, water, and prey. These fish are critical links in the Hudson River food web. Fish are both predators and prey in the Hudson River; they eat plants, insects, and other fish, and in turn, may be eaten by amphibians, reptiles, birds, mammals and other fish. This fact sheet provides information about a preliminary investigation regarding the effects of PCBs on fish.

BACKGROUND

As part of the Hudson River NRDA, the Trustees are studying whether PCBs adversely affect fish in the Hudson River. Initially the Trustees reviewed existing field and laboratory studies to evaluate the effects of PCB exposure on Hudson River fish. Next, the Trustees assembled an expert panel to review that information and to provide guidance to the Trustees on next steps for determining whether PCBs are adversely affecting Hudson River fish. The expert panel recommended laboratory testing to evaluate the relative sensitivity of early life stages of different Hudson River fish species to PCBs.



Shortnose sturgeon (*Acipenser brevirostrum*).

Photo courtesy of U.S. Fish and Wildlife Service

STURGEON TOXICITY PILOT STUDY 2009

The Trustees are conducting a pilot study on the effects of PCBs on early life stages of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*). Shortnose sturgeon is an endangered species that spends its entire life in the Hudson River. Atlantic sturgeon is a species of concern that spawns in the Hudson River Estuary, and the estuary provides nursery habitat for juvenile fish before they migrate to sea. Both species can live to over 60 years of age and are exposed to PCBs because they feed on organisms that live in the mud at the bottom of the river.

The objective of the pilot study is to determine if early life-stages of these two fish species are sensitive to the toxic effects of PCBs. To conduct the study, Atlantic and shortnose sturgeon embryos obtained from ongoing programs that culture these species will be exposed to PCBs under controlled laboratory conditions. Throughout the study, fish that are exposed to PCBs will be compared with fish that are not exposed to PCBs. These comparisons will determine if embryo mortality, hatching rate, larval survival, physical deformities (e.g., spine, heart), and other indicators of chemical exposure differ between the exposed and unexposed fish.

NEXT STEPS

Depending on the results of this pilot study, the Trustees may conduct additional field investigations and/or laboratory studies to further evaluate the effects of PCBs on Hudson River fish.



Fish larva showing deformity (edema) following exposure to PCBs.

Photo courtesy of R.C. Chambers, NOAA

PCB EFFECTS ON FISH

Studies have documented high levels of PCBs in Hudson River fish. Some adverse effects of PCBs on fish include impaired reproductive, endocrine, and immune system function, increased lesions and tumors, and death. However, very few studies have assessed whether the PCB contamination in the Hudson River is harming Hudson River fish.



The Hudson River Trustees—assessing and restoring your natural resources

Further information on the Hudson River NRDA can be found on the following websites:

www.darp.noaa.gov/northeast/hudson/index.html

www.dec.ny.gov/lands/25609.html

<http://contaminants.fws.gov/restorationplans/HudsonRiver/HudsonRiver.cfm>

To add yourself to the **Hudson-NRDA listserv**:

1. Send a message to: requests@willamette.nos.noaa.gov
2. Write in the subject: Subscribe hudsonnrda

Hudson River Natural Resource Trustees
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If you have questions about natural resource damages, or want to submit a restoration project or be placed on the Hudson River NRDA mailing list, please contact one of the individuals listed below:

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