



OCTOBER 2007

PRELIMINARY INVESTIGATIONS OF PCBs IN HUDSON RIVER BATS

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 of natural resources and determining appropriate actions to restore those resources. Natural resource damage payments provide a means for the Trustees to restore the 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.



Indiana bat, *Myotis sodalis*

The Hudson River and its surrounding habitat support nine species of bats, including the Indiana bat, *Myotis sodalis*, a state and federally listed endangered species. Bats that reside in the Hudson River Valley may be exposed to PCBs through the food web and may be at risk from that exposure. Bats may be particularly at risk from mobilization of stored organochlorines, including PCBs. The long life span of bats also allows more time for contact with, and accumulation of, contaminants. Similarly, relatively low reproductive rates (generally 1-2 young per year) can result in slow recovery of affected bat populations affected by PCBs.

This fact sheet provides information about a preliminary investigation by the Trustees assessing the exposure of Hudson River bats — specifically little brown bats (*Myotis lucifugus*) and big brown bats (*Eptesicus fuscus*) — to PCBs.

PCB EXPOSURE AND EFFECTS

Many laboratory and field studies done in other parts of the country have shown the potentially harmful effects of PCBs on fish, birds, selected mammals, and other wildlife. However, toxicological data on the impacts of PCBs on bats are limited. Past Trustee studies have revealed the presence of PCBs (over 5 parts per million) in emergent aquatic insects from the Hudson River. Little brown and big brown bats are insectivorous, and those on the Hudson River likely feed on these PCB-contaminated insects. Some past bat studies from other locations indicate that exposure to PCBs may cause behavioral abnormalities, biochemical alterations, and reduced survival of young. Bats are also prey for higher trophic level predators, including some migratory birds such as barred owls. Bats may thus provide a pathway of exposure of other wildlife to PCBs.

PRELIMINARY INVESTIGATION

The Trustees conducted a preliminary investigation to assess the extent to which bats along the Hudson River are exposed to PCB contamination. In July 2001, the Trustees collected bats from along the Hudson River at the Saratoga National Historic Park and from reference sites in New York State. In July 2002, the Trustees conducted a supplemental collection of bats from three other sites along the Upper Hudson River.

Thirty-one bats collected in 2001 (26 little brown bats and 5 big brown bats) were selected by the Trustees for sample preparation and analysis. The bats were dissected and the brains analyzed for PCB congeners, PCB homologue groups, and total PCBs.

The results show that Hudson River bats have been exposed to PCBs. Total PCBs in the brains of big brown bat females range from about 32 to 640 parts per billion (ppb). Total PCBs in the brains of little brown bat males and females range from about 1,800-2,400 ppb and about 270-1,800 ppb, respectively. By comparison, total PCBs in brains of little brown bat females from reference areas range from non-detect to about 660 ppb.

NEXT STEPS

This preliminary investigation confirms that Hudson River bats are exposed to PCBs. As a next step the Trustees are using available scientific literature and consultation with experts to evaluate the possible effect these PCBs may have on bat health. The Trustees are also considering the need for future injury determination studies of bats.



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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