



Hudson River Natural Resource Damage Assessment Plan

More information from this division:

[Bureau of Habitat](#)
[Hudson River Assessment Page](#)

Table of Contents

[Executive Summary](#)
[The Trustee Role](#)
[Natural Resource Damage Assessment - How it Works](#)
[About the Damage Assessment Plan](#)
[How you can help](#)
[Index](#)

[Hudson River Natural Resource Damage Assessment Plan](#) (pdf file, 2019k, 81 pages) This file takes approximately 10 minutes and 30 seconds to download with a 28.8Kbps modem.

[PDF Help](#)

For help with the PDF(s)
on this page call (518)402-8924

Executive Summary

The Hudson River flows from its source in the Adirondack Mountains to its confluence with New York Harbor at the Battery in Manhattan, a distance of about 315 miles. The Hudson River has provided important natural resources and services to the residents of the Hudson River Valley since the earliest days of human settlement. The earliest European exploration was by Henry Hudson in the early seventeenth century. The Hudson River provided a travel corridor to facilitate westward exploration of New York by European settlers and was a focal point during the Revolutionary and French and Indian Wars. President Franklin Delano Roosevelt made his home along the Hudson River near Hyde Park, New York. Because of its rich resources and heritage, the Hudson River has been formally recognized as an American Heritage River and serves as the site of a National Estuarine Research Reserve.

The river has been used as a transportation corridor for commercial and recreational traffic, and has supported commercial and recreational fishing, as well as swimming and boating. Also, the river has been used in

the direct generation of electricity, and as a source of cooling water for other forms of power generation. Many river communities have depended on the Hudson River as a source of potable water. Over time, ever-increasing urbanization and industrialization began to degrade the river and its natural resources.

In the early 1970s, a group of toxic compounds known as polychlorinated biphenyls, or PCBs, were discovered in the water, fish, and sediment of the Hudson River below General Electric Company's (GE's) plants at Hudson Falls and Fort Edward. As a result of PCB contamination, fishing was banned in the Upper Hudson River from Hudson Falls to Troy between 1976 and 1995, and fishing in that river reach is currently restricted to catch and release only (1). In addition, the Hudson River below the Federal Dam at Troy was closed to commercial fishing for almost all species of fish, and fish in that part of the river have been the subject of "no consumption" or restrictive consumption advisories due to PCB contamination. The discovery of PCBs in the Hudson River and other locations also prompted many scientists to study the effects of these compounds on wildlife. Years later, this research indicates that PCBs can cause serious injuries to wildlife and other natural resources.

The Trustee Role

The responsibility for restoring natural resources that have been injured by hazardous substances belongs to Federal, State, and Tribal Trustees for fish, wildlife, other living resources, water, lands, and protected areas. Trusteeship is derived from Federal and Tribal treaties, Federal and State statutes, and other laws. For the Hudson River, the Trustees are the U.S. Department of Commerce, the U.S. Department of the Interior (DOI), and the State of New York (collectively "the Trustees"). These entities have each designated representatives that are responsible for evaluating the injuries associated with hazardous substance contamination of natural resources and determining appropriate actions to restore those resources. For the Hudson River, the organizations that have been designated to perform these evaluations are the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (USFWS), which represents the concerned DOI agencies (USFWS and the National Park Service), and the New York State Department of Environmental Conservation (NYSDEC).

The process by which the Trustees evaluate the injuries associated with hazardous substance contamination in natural resources is known as a natural resource damage assessment (NRDA). The ultimate objective of a NRDA is to restore natural resources that have been injured by hazardous substance contamination to baseline, or the condition that would have existed if the hazardous substances were not released. In addition, the Trustees may obtain compensation for natural resource injuries and the loss of the services they provide between the onset of the injury and full restoration.

The U.S. Congress enacted the Superfund law to assign responsibility for

the cost of cleaning up hazardous substances that threaten human health and the environment, and for restoring or replacing any public natural resources that are harmed by hazardous substance releases. It is the U.S. Environmental Protection Agency's (EPA's) responsibility to select a remedy that is intended to reduce or eliminate current and future threats to human health or the environment. It is the Trustees' responsibility to restore or replace the natural resources that are harmed. Congress determined that, rather than requiring the taxpayers to bear the costs of cleanup and restoration, it was fairer and more reasonable that entities that profited from the generation and inexpensive disposal of hazardous substances, or had other significant connections to a site containing hazardous substances, be responsible for addressing the harms caused by those substances. Natural resource damages are therefore not penalties or fines. Rather, they provide a means to restore the injured public resources to the condition they would have been in but for the release, and to compensate the public for lost services provided by those resources.

Natural Resource Damage Assessment - How it Works

General guidelines for performing a natural resource damage assessment involving hazardous substances such as PCBs are described in regulations written by the U.S. Department of the Interior and appear in the Code of Federal Regulations at Title 43 Part 11. These guidelines describe methods for (1) deciding to conduct a damage assessment, (2) establishing that hazardous substance contamination has injured natural resources, (3) determining the quantity of injured natural resources, (4) determining the amount of restoration required to fix or replace the injured natural resources and compensating the public for the lost functions, and (5) planning and conducting projects designed to restore the injured resources.

The first phase of a NRDA is the preassessment phase, during which the Trustees organize and assess available information about the area of concern and summarize their findings in a document called a Preassessment Screen Determination (PSD). The Trustees issued a PSD in October 1997, formalizing their decision to proceed with a NRDA for the Hudson River. The Preassessment Screen Determination documents the following: PCBs were released to the Hudson River; Trustee resources have been or are likely to have been adversely affected by the PCBs; the concentration of the PCBs is sufficient to potentially injure natural resources; the data necessary to conduct a NRDA are available or can be obtained at a reasonable cost; and, the completed or planned response actions would neither completely remediate the injuries to natural resources nor compensate for the public's lost use.

About the Damage Assessment Plan

Following issuance of the Preassessment Screen Determination, the Trustees determined that development of a Damage Assessment Plan was appropriate. The Trustees then issued, for public review and comment, a "Draft Scope for the Hudson River Natural Resource Damage Assessment

Plan." That scoping document, which contained a preliminary outline of the potential contents of a Damage Assessment Plan for the Hudson River, formed the basis for subsequent development of this document.

This document, known as a Damage Assessment Plan, is part of the Hudson River NRDA. The purpose of this Assessment Plan is to structure the NRDA to ensure that it is performed in a planned and systematic manner and at a reasonable cost. Reasonable cost means that the anticipated cost of the assessment is expected to be less than the anticipated damage amount determined in the assessment. This Assessment Plan describes the activities that constitute the Trustees' currently proposed approach. These efforts are designed to provide more information on the nature and extent of the injuries associated with PCB contamination in the Hudson River.

This Assessment Plan documents that natural resources of the Hudson River have been exposed to contamination by PCBs. Those natural resources of the Hudson River for which exposure to PCBs has been confirmed are:

- Biota, including fish, birds, mammals, amphibians, reptiles, and invertebrates
- Surface water resources, including river sediments
- Groundwater resources
- Geologic resources, including floodplain soils, and
- Air resources

This Assessment Plan provides information regarding three major steps in the assessment: pathway and injury determination, injury quantification, and damage determination and restoration. This framework is consistent with the DOI regulations and provides an effective means of considering the impacts of PCB contamination in the Hudson River environment. Within each of these steps, the Trustees propose individual investigations (listed below) that, together, will define the nature and extent of injuries caused by PCBs in the Hudson River environment. Investigations may be added or removed as determined appropriate by the Trustees based on additional information developed by the Trustees. This is an iterative process which may take several years to complete.

During the pathway determination phase of the assessment, the Trustees will document how PCBs move through the environment. The Trustees' currently proposed approach to pathway determination entails three studies, as follows:

- PCB sources to sediment and water
- Food web pathway evaluation, and
- Floodplain evaluation

The studies listed above are preliminary investigations. Should the Trustees determine, based on such preliminary investigations, that a full pathway determination study is warranted, the Trustees will develop a

study plan for that effort that will be peer reviewed and released to the public for comment.

During the injury determination and quantification phase of the assessment, the Trustees undertake investigations to determine the injuries to natural resources resulting from exposure to PCBs, and then quantify those injuries, including how long each resource has been or will be injured, and the reduction in services that has resulted from the injury. This Assessment Plan identifies procedures that are appropriate to evaluate the injuries to natural resources associated with exposure to PCBs.

The Trustees are considering conducting injury determination and quantification for the following Hudson River resources: fish, birds, mammals, amphibians and reptiles, surface water, groundwater, geologic resources, and air. The Trustees' currently proposed approach to injury determination and quantification entails the following specific investigations:

- Fish consumption advisory
- Fish - FDA evaluation
- Preliminary fish evaluation
- Fish health reconnaissance survey
- Effects of PCBs on early life stages of fish
- Waterfowl consumption advisory
- Waterfowl - FDA evaluation
- Preliminary avian evaluation
- Breeding bird survey
- Bird egg study
- Evaluation of avian exposure from feeding on floodplain organisms
- Bald eagle monitoring
- Mink and otter health
- Bat exposure
- Snapping turtle consumption advisory
- Snapping turtle health
- Water quality evaluation
- Sediments characteristic of solid waste
- Sediments injury: pathway and biota
- Groundwater quality evaluation
- Geologic resource evaluation
- Air quality evaluation

The studies listed above can be categorized as either preliminary investigations or injury determination/quantification studies. Many of the studies listed above are preliminary investigations, designed to improve the Trustees' understanding of exposure of Hudson River resources to PCBs. Data from these preliminary investigations will then be assessed by the Trustees to determine whether injury determination/quantification studies are warranted, or whether a particular resource should not be assessed further for injury. Should the Trustees determine, based on such a preliminary investigation, that an injury determination study is

warranted, the Trustees plan to develop a study plan for that effort that will be peer reviewed and released to the public for review and comment. The results of any study conducted pursuant to such a study plan will be peer reviewed upon completion of the study, and the results then released to the public.

Based on the results of the injury determination and quantification, the Trustees will establish the total quantity of injured natural resources that must be restored or replaced, or for which the equivalent must be acquired. The Trustees will also calculate the total reduction in services that has resulted from the injury. The Trustees will then determine how to restore, replace, or acquire those resources. The Trustees will also determine the compensable value of services lost to the public from the time of the release to full restoration. This can be done by establishing the value of the injured resources or by calculating the cost of the restoration projects that will compensate the public for the injuries. This is done in the damage determination and restoration phase of the assessment. The Trustees' currently proposed approach to damage determination and restoration entails four studies, as follows:

- Recreational fishing lost use study
- Habitat equivalency analysis
- Assessment of lost navigational services
- Assessment of impacts to National Park Sites and Affiliated Areas

The results of any of these, or other, studies undertaken by the Trustees will be contained within the Report of Assessment to be issued by the Trustees at the conclusion of the assessment. The Report of Assessment will be released to the public.

This Assessment Plan is a living document that the Trustees will continue to develop and refine as the NRDA progresses. As Trustee investigations proceed and as new study plans are proposed, the Trustees intend to issue updates, including fact sheets, so that all interested individuals can remain apprised of ongoing and planned NRDA activities. As additional opportunities for public involvement arise, the Trustees plan to advertise those opportunities in newspapers, direct mailings, and on the Trustees' internet sites, and to provide information on how to participate. The internet sites for NOAA, USFWS, and NYSDEC are available at:

- <http://www.darp.noaa.gov/neregion/hudsonr.htm> (leaving DEC's site)
- <http://contaminants.fws.gov/restorationplans/HudsonRiver.cfm>
(leaving DEC's site)
- <http://www.dec.state.ny.us/website/dfwmr/habitat/nrd/index.htm>

The Trustees will consider all public comments and input on the Assessment Plan, and will prepare a responsiveness summary to the comments. Based on the public's comments or other information, the Trustees may modify the Assessment Plan at any time. Any modifications will be made available for review by the public, including the party or

parties responsible for the contamination. At the conclusion of this assessment, the Trustees will prepare a Report of Assessment that includes this Assessment Plan, as well as any comments and responses to comments on plan modifications and subsequently developed study plans and any additional information relevant to the assessment. The Report of Assessment will be released to the public.

How You Can Help

The Trustees are interested in receiving feedback on this Assessment Plan. To facilitate this process, the Trustees are asking the public and the party or parties responsible for the contamination to review the Assessment Plan and provide feedback on the proposed approach and studies. Comments should be submitted by November 1, 2002. These comments will help the Trustees plan and conduct an assessment that is scientifically valid, cost effective, and that incorporates a broad array of perspectives. To that end, the Trustees request that you carefully consider this Assessment Plan and provide any comments you may have to:

Contact for Public Comments

Steven Jay Sanford

Chief, Bureau of Habitat

Division of Fish, Wildlife and Marine Resources

New York State Department of Environmental Conservation

625 Broadway

Albany, NY 12233

518-402-8996

fax: 518-402-8925

sxsanfor@gw.dec.state.ny.us

Index

List of Acronyms and Abbreviations	iii
Executive Summary	1
Chapter 1 The Natural, Cultural, and Economic Significance of the Hudson River	7
Ecological Communities of the Hudson River	9
Hudson Falls to Troy	10
Troy to Newburgh	11
Newburgh to Manhattan	12
Historical Significance of the Hudson River	15
Recreation and the Modern Economy	17
Further Economic Significance of the Hudson River	18
Chapter 2 PCB Contamination in the Hudson River	19
History and Effects of PCBs in the Hudson River	19
Cleaning Up PCBs in the Hudson River	21
Chapter 3 The Role of The Trustees	27

Preliminary Determination of the Recovery Period	30
Coordination with Other Government Agencies	31
Importance of Public Participation	32
Invitation for Cooperative Assessment	33
Chapter 4 The Hudson River NRDA: Assessment and Restoration	35
Pathway Determination	36
PCB Sources to Sediment and Water	37
Food Web Pathway Evaluation	37
Floodplain Evaluation	38
Injury Determination and Quantification	38
Biological Resources	39
Surface Water	50
Groundwater	52
Geologic Resources	53
Air	53
Damage Determination and Restoration	54
Recreational Fishing Lost Use Study	54
Habitat Equivalency Analysis	55
Assessment of Lost Navigational Services	55
Assessment of Impacts to National Park Sites and Affiliated Areas	56
References	57
Glossary	63
Appendix A: Quality Assurance Management	67
Appendix B: Fact Sheets	71
Assessing Fish Health	73
Preliminary Investigations of Bird Injuries	75
Preliminary Investigation of Snapping Turtles	77
Hudson River Natural Resource Damage Assessment: Summary of the NRDA Plan	79
Exhibits	
Exhibit 1-1	Hudson River Below Corinth, New York
Exhibit 1-2	Endangered, Threatened, Special Concern or Rare Species Identified in or Near the Hudson River by the State of New York or as Potentially Occurring in or Near the Hudson River by the U.S. Fish and Wildlife Service
Exhibit 1-3	Selected Events in the Recorded History of the Hudson River
Exhibit 2-1	Basic Chemical Structure of PCBs

Exhibit 2-2	PCB Concentrations in Selected Hudson River Natural Resources, Regulatory Criteria and Guidelines, and Threshold/Effects Identified in the Literature	22- 24
Exhibit 2-3	Selected Chronology of Events Related to the Discharge, Discovery, and Removal of PCBs in the Hudson River	25
Exhibit 4-1	Pathway Determination	37
Exhibit 4-2	Injury Determination and Quantification	40- 41
Exhibit 4-3	Damage Determination and Restoration	55
Exhibit A-1	Project Quality Assurance Organization	68

This page was last revised on Friday, September 13, 2002

[Back to top of page](#)