



Citizens' Guide to Hudson River Natural Resource Damage Assessment and Restoration

*By Rich Schiafo
September 2004*



CATCH AND RELEASE FISHING ONLY

All fish must be returned to the water immediately, without unnecessary injury.

Fish from these waters have high levels of chemical contaminants (PCBs) that may cause reproductive and developmental effects and cancer.

DO NOT POSSESS, REMOVE OR EAT FISH FROM THIS WATER

NYS Department of Environmental Conservation - 518-457-1769
NYS Department of Health - 1-800-458-1158 ext. 409



ACKNOWLEDGEMENTS

The author is grateful to the following people and organizations for their support and assistance with this project.



Scenic Hudson colleagues Alix Gerosa, Jay Burgess, Warren Reiss, Kerri Karvetski, Chris Davis Cina, David Diaz, and Donna Lenhart.



The following individuals for generously contributing time, providing telephone interviews, answering questions, providing leads on other sources of information and assisting in gathering images and graphics: Angela Bonarrigo, U.S. Environmental Protection Agency; Colette Charbonneau, U.S. Fish and Wildlife Service; Rachel Fletcher, Housatonic River Restoration Inc.; Meg Gibson, Vassar College; Tim Gray, Housatonic River Initiative; Stacy Greendlinger, U.S. Environmental Protection Agency; Melissa Hamilton, New York State Department of Environmental Conservation; Rebecca Leighton Katers, Clean Water Action Council; Dan Miller, New York State Department of Environmental Conservation; Jim Simmons, Hands Across the River Coalition; Jack Terrill, National Marine Fisheries, National Oceanic and Atmospheric Administration.



Many thanks to peer reviewers: Jeff Jones and Tim Sweeney, Environmental Advocates of New York; Debbie Mans and Aviva Zuller, NY/NJ Baykeeper; Lisa Pelstring, National Oceanic and Atmospheric Administration.



The preparation of this guide has been financed through a research grant from the **Hudson River Foundation for Science and Environmental Research, Inc.** The views expressed herein do not necessarily reflect the belief or opinions of the foundation, which assumes no responsibility or liability for the contents or use of the information herein.



Scenic Hudson, founded in 1963, is dedicated to protecting, preserving and restoring the Hudson River and its riverfront as a public and natural resource. To realize this vision, the group's experienced leaders and staff of experts combine coalition building, citizen-based advocacy and sophisticated planning tools to create environmentally healthy communities, champion smart economic growth, open up riverfronts to the public and preserve the valley's inspiring natural beauty.

www.scenichudson.org

Cover: Upper Hudson River looking north from North UMBERLAND Bridge.
Photo credits: Rich Schiafo, David Menke, Melissa Hamilton. Design: Pen & Ink Creative

30-Year Battle Reaches Critical Stage – Citizen Action Needed Today

During 2000 and 2001, the entire country witnessed a grand drama, three decades in the making, about the future of our treasured Hudson River. During these two years a highly publicized debate was waged among the General Electric Co.; U.S. Environmental Protection Agency; national, state and regional environmental groups; and citizens over removing PCBs from this legendary waterway. In February 2002, the EPA issued an **historic decision requiring a cleanup to rid the Hudson of 150,000 pounds of toxic, health-threatening PCBs.**

In the meantime federal and state agencies launched a parallel investigation to determine if the **Hudson River's natural resources were injured by PCBs.** Beyond the removal of PCBs from the river, **federal law mandates restoration of damaged natural resources.**

This assessment provides champions of our river – like you – a golden opportunity to help steer natural resource restoration. But to make a difference, you must be part of the process. This guide will give you a clear understanding of how you can **get engaged in this vital program.** Seize this moment, get active today and stay involved, until we all achieve our goal – **restoring the river so that it can be enjoyed and cherished for generations.**

Sincerely,



Ned Sullivan

President

Scenic Hudson

“Get active today and stay involved, until we all achieve our goal – restoring the river so that it can be enjoyed and cherished for generations.”

Citizens' Guide to Hudson River Natural Resource
Damage Assessment and Restoration

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EXECUTIVE SUMMARY

Natural resources such as water, the things that live in water – fish, turtles, and frogs – and other living creatures, such as birds and mammals, can be injured when hazardous substances, such as polychlorinated biphenyls (PCBs) are released into the environment. Injuries to these resources also can adversely affect the public's ability to use and enjoy the resources. Natural resources are held in the public trust – for us to protect, enhance and enjoy. When they are injured, the law provides a remedy. Public participation in development of this remedy is essential.

The authority to restore injured natural resources, as discussed in this guide, is set forth in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), [42 U.S.C. § 9607], commonly known as Superfund. Under CERCLA, those responsible for releasing a hazardous substance are required to restore injured natural resources and compensate the public for lost use of those resources.

Natural Resource Damage Assessment (NRDA) is the process used by federal and

state government agencies, as trustees, to (1) determine the nature and extent of natural resource injuries caused by a hazardous substance and (2) the need for compensation and restoration to address those injuries. NRDA can involve detailed studies on specific natural resources to identify and quantify injuries. The methodology and process to assess and restore natural resource damages, however, can vary from site to site. It also is important to note that, at any time in this process, trustees and those responsible for releasing the hazardous substance may reach a settlement, thereby precluding a full NRDA as described in this guide.

This guide is intended to help citizens understand the lengthy scientific and legal process set up to assess and restore injured natural resources with particular focus on the Hudson River PCBs Superfund site. It will identify when, where and the best ways to affect this process so that the ultimate goal – restoration of natural resources – can be enhanced through citizen participation.



Rich Schiafo

NRDA funds often are used to restore wetlands to protect and provide habitat for species that were injured by the release of a hazardous substance.

Understanding Natural Resource Damages

The process for restoring damaged natural resources is similar to the process for repairing a car that has been damaged in an accident. Barring human injury, compensation for the damaged vehicle is expected either as monetary compensation or restoration of the vehicle to its prior condition.

A car is usually damaged by another vehicle. Natural resources are damaged by the release of a hazardous substance. Just as with a vehicle, natural resources must be restored to the condition that existed prior to the release of the hazardous substance. Determining damage to a vehicle is fairly straightforward, because there are bluebook values for automobiles as well as established prices for replacing vehicle parts. With no such value guides for birds, mammals or other natural resources, determining damage and restoration for natural resource injuries is considerably more difficult.

The lost use of a car is akin to the lost use of a natural resource. Compensation for the lost use of a car, during repairs, most often takes the form of an allowance for a rental car. The inability to catch and consume fish contaminated by a hazardous chemical has resulted in the lost use of the fish and thus compensation for that lost

use is expected and deserved. However, compensating the public for the lost use of natural resources is inherently more challenging.

Hudson River NRDA

Hudson River natural resources have been injured by the General Electric Co. (GE) release of PCBs into the Hudson River. As the responsible party under CERCLA, GE is required, to “restore, rehabilitate, replace and/or acquire the equivalent of those natural resources that have been injured” by the release of PCBs. The Hudson River Trustees, responsible for assessing injuries and recovering damages are the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service and the New York State Department of Environmental Conservation. The Hudson River NRDA will lead to either a settlement of GE’s NRDA liability under CERCLA or possibly litigation initiated by the trustees to recover damages.

Based on experience at other contaminated sites, natural resource damages often are settled before a full assessment is complete. NRDA settlements often occur as part of a responsible party’s settlement of liability for hazardous waste cleanup.

A Hudson River NRDA settlement discussion may occur when and if GE and the EPA discuss the final cleanup agreement. GE may seek a “global” settlement of all of its Hudson River PCB contamination liability including both cleanup and restoration. Both EPA and the Hudson River Trustees participate in these negotiations, but to date neither cleanup nor restoration liabilities have been settled. Trustees may seek a settlement at any time.

Whether a settlement occurs in the near future or a lengthy assessment and legal battle ensues, it is important that the public stay informed and involved to hold trustees and GE accountable for adequately assessing injury, appropriately restoring natural resources and sufficiently compensating the public for the lost use

“Citizens are strongly encouraged to think about community-based ecological restoration, keeping in mind how such restoration can benefit the larger ecosystem.”



Courtesy of Melissa Hamilton

Mammals, such as river otters, accumulate high levels of PCBs by consuming contaminated fish, which may adversely affect their ability to reproduce.



Creating access to a restored fishery is one way the public can be compensated for lost opportunities that resulted from fishing bans due to the release of PCBs.

of resources caused by PCBs. An informed and active citizenry will lead to a successful restoration of Hudson River natural resources.

Restoration of Natural Resources

One of the simplest and most effective ways for citizens to participate in the Hudson River NRDA is by suggesting potential restoration project ideas to address the injuries caused by PCBs.

The Hudson River Trustees have stated that, "Restoration is the goal of a NRDA. It is an active component of damage assessment that can be seen and felt for generations. For example, restoration projects may improve or create aquatic habitats, thereby providing fish with clean spawning habitat and anglers with opportunities to catch fish with reduced PCB levels. Similarly, restoration may involve creating conservation areas and nesting sites that are attractive to waterfowl, eagles, owls, or other birds. Restoration also may include increasing the viability and abundance of threatened, endangered, special concern, or rare species."

In 2000, the Hudson River Trustees began soliciting ideas for restoring natural resources injured by PCBs. Some ideas generated by the public include:

- Preserve freshwater intertidal habitats
- Preserve habitats with rare and endangered species and/or significant biodiversity
- Restore herring runs

- Restore oyster beds
- Restore striped bass fishery and spawning population
- Restore waterfowl habitat
- Construct fish ladders to bypass migratory obstructions
- Control invasive plant species (phragmites, purple loosestrife, water chestnut)
- Control sediment runoff and other sources of nonpoint source pollution
- Remove dams
- Restore wetlands
- Restrict access through vegetated buffers
- Secure conservation easements on farms and working forests along the upper Hudson

A more complete summary of the Hudson River proposals can be found on page 24.

Citizens are strongly encouraged to think about community-based ecological restoration, keeping in mind how such restoration can benefit the larger ecosystem. The Hudson River NRDA provides a vehicle for broad-based restoration as long as the proposed restoration is connected to the PCB-related injury. A Hudson River NRDA restoration proposal form is found in Appendix B. Please copy and complete this form for submission to the Hudson River Trustees. In addition please share this form with others interested in restoring Hudson River natural resources.

“One of the simplest and most effective ways for citizens to participate in the Hudson River NRDA is by suggesting potential restoration project ideas to address the injuries caused by PCBs.”

Summary

The history of the Hudson River PCBs Superfund site as well as a detailed description of the PCB injury assessment work being done along the Hudson River are presented in this section. This will provide the foundation for citizens to get involved in the Hudson River NRDA.

The ultimate goal of the NRDA is restoration of natural resources. Therefore, citizens are strongly encouraged to actively participate in shaping the restoration of Hudson River natural resources. To help citizens stay informed, this section also presents information on how to request a trustee presentation on the Hudson River NRDA, or join the Hudson River NRDA listserv, an electronic newsletter.

The Hudson River and PCBs

Hudson River Facts

- Source – Lake Tear of the Clouds – Adirondack Mountains
- Drains approximately 13,390 square miles – four states
- Flows southward for 315 miles – emptying into New York Harbor
- Upper River – freshwater system – 160 miles – Adirondacks to Troy Dam
- Lower River – tidal estuarine system – 155 miles – Troy Dam to New York Harbor
- Home to more than 200 species of fish
- Home to more than 150 species of birds
- 64 species are threatened, endangered, rare or of special concern
- Estuarine portion – 41 sections of significant tidal habitat
- 34 areas designated as Significant Coastal Fish and Wildlife Habitats; also Essential Fish Habitat
- Four designated areas – NOAA National Estuarine Research Reserve
- American Heritage River

History of PCBs in the Hudson River

Polychlorinated biphenyls (PCBs) are a family of man-made chemicals widely used as insulators, coolants and lubricants from 1930 until their manufacture was banned

in 1977. Highly stable chemical compounds, PCBs are very resistant to breakdown in the environment and concentrate thousands of times as they pass up the food chain. They remain a common toxic pollutant more than 25 years after production and use was halted.

Today, PCBs dumped into the Hudson River by GE can be found in sediment, water and animals throughout the river ecosystem.

Beginning in the 1940s, GE used PCBs at two manufacturing plants on the Hudson River at Hudson Falls and Fort Edward. Until PCBs were banned in 1977, it is estimated that up to 1.3 million pounds of PCBs were discharged into the Hudson River resulting in a 200-mile stretch from Hudson Falls to New York Harbor being classified a national hazardous waste or Superfund site in 1983.

Large amounts of PCBs remain concentrated in river sediments in a 40-mile stretch of the upper Hudson between Fort Edward and the Troy Dam. The U.S. Environmental Protection Agency (EPA) has concluded that the main source of PCBs to the rest of the river are the contaminated sediments in the upper Hudson.

The two GE plant sites are heavily contaminated and continue to release PCBs into the Hudson River. These facilities and surrounding properties are being cleaned up, but the task is far from complete. Cleaning up the GE plant sites along with removal of contaminated sediments in the Hudson River are critical to restoring the Hudson River.





Rich Schiafo



Tom Ligamari



Rich Schiafo

From the 1940s to the 1970s, GE discharged PCBs into the Hudson River leading to fishing bans and restrictions along 200 miles of the river from Hudson Falls to New York City.

High PCB levels in commercially important fish led New York State to prohibit commercial striped bass fishing in the Hudson River in 1976. It remains closed today. A settlement was already reached with commercial fishermen and will not be a part of this NRDA claim.

The Hudson River PCB Superfund Saga

In 1984, the EPA issued an interim “no-action” decision regarding Hudson River PCBs based on uncertainty about the effects of dredging. The 1984 decision did call for the capping of some shoreline contamination – known as the “remnant deposits.” Four of five of these were capped in 1990.

In 1989, the EPA announced that it would reevaluate the 1984 “no-action” decision. Following more than ten years of scientific analysis and debate, in February 2002 the EPA decided that 2.65 million cubic yards of sediment containing 150,000 pounds of PCBs would need to be removed from the upper Hudson to protect public health and the environment. Under the federal Superfund law, GE is responsible for the cleanup.

Following the design phase, the PCB cleanup is currently scheduled to begin in 2006. The targeted dredging project is expected to take six years.

The Role of the Trustees

NRDA trustees are obligated by law to assess injuries to natural resources, recover damages and restore the injured

resources to the baseline condition that existed prior to the release of the hazardous substance. Hazardous waste sites most often have more than one trustee. The respective federal and state agencies and Indian tribes usually share trustee responsibilities, where applicable.

The Hudson River NRDA Trustees are the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (FWS) and the New York State Department of Environmental Conservation (NYSDEC).

NOAA is responsible for coastal and marine resources, including tidal wetlands, commercial and recreational fishery resources, and habitats of migratory fish. Natural resources entrusted to the FWS are national wildlife refuges, migratory birds, and threatened and endangered species. The NYSDEC is responsible for all of the publicly held state natural resources.

Trustees Bear Burden of Proof

Through the NRDA process, the trustees are building a legal case against the responsible party, GE, compiling evidence proving the release of PCBs caused injuries to natural resources. The burden of proving injury based on contamination lies with the trustees.

It is widely acknowledged that unacceptably high levels of PCBs are found in Hudson River fish and throughout the food chain. However, the mere existence or contact with PCBs does not prove there was an injury. While many hazardous sub-

NRDA trustees are obligated by law to assess injuries to natural resources, recover damages and restore the injured resources to the baseline condition that existed prior to the release of the hazardous substance.

Roles of Government Agencies

Comparing the cleanup and restoration process to a house fire can help explain roles and responsibilities. The EPA is the fire company, the responder that puts the fire out and oversees the cleanup. The trustees oversee the rebuilding or restoration of the house to its condition before the fire. GE started the fire, (by releasing PCBs into the Hudson River), and is responsible for the cost of both cleanup and restoration.

stances, such as PCBs, are known to have adverse ecological effects, the burden is on the trustees to prove that contact to a contaminant has actually resulted in an injury to the natural resource or the public's ability to use that resource.

Hudson River NRDA – Restoring to Baseline

The Hudson River Trustees have determined that the presence of GE's PCBs warrants further investigation. They are in the midst of developing a natural resource damage claim by assessing injuries caused by PCB contamination.

The goal of the Hudson River NRDA is to fully restore Hudson River natural resources injured by PCB contamination to baseline: the condition that would have

existed if PCBs had not been released into the Hudson River. In addition to restoring injured resources, compensation can be sought for lost services provided by those resources.

Restoring Hudson River Natural Resources to Baseline Could Include:

- Fish, sediment and other natural resources not contaminated with PCBs
- Elimination of fish consumption advisories
- Bird health and reproduction unimpaired by PCBs

Coordinating Cleanup and Restoration

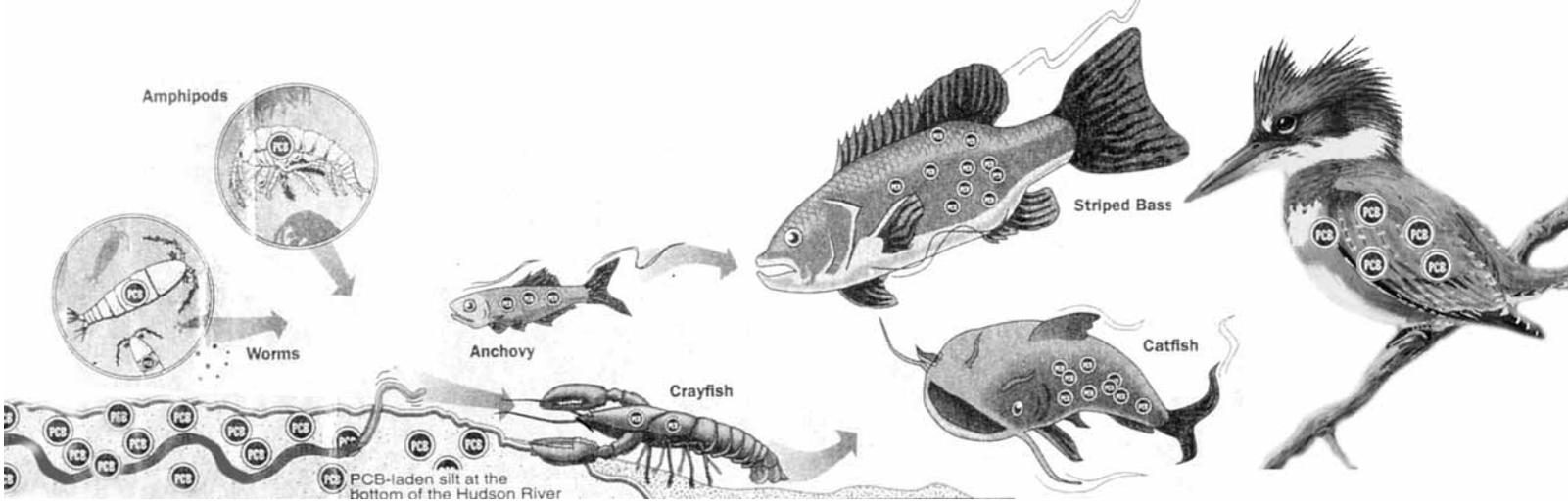
The Hudson River PCB cleanup and Hudson River NRDA are separate processes conducted by different government agencies, but they are interdependent and intimately related. Trustees, with expertise in habitats and sensitive species, are assessing the natural resource damages caused by PCBs. The EPA, with expertise in the risks associated with hazardous substances and protection of public health, is overseeing the cleanup. Coordination is essential to maximize both cleanup and restoration efforts and to avoid conflict.

The goal of the Hudson River NRDA is to fully restore Hudson River natural resources injured by PCB contamination.



Dave Menke, courtesy of Audubon

Increased levels of contaminants such as PCBs are suspected of causing severe reproductive problems in bald eagles.



As PCBs move up the food chain they accumulate in animals potentially injuring natural resources.

Although the EPA is not a trustee, CERCLA places the responsibility for coordinating the cleanup and restoration efforts with the agency. The Hudson River Trustees participate in the EPA’s investigations, planning and design work at the Hudson River PCBs site.

Restoring the river’s natural resources can be enhanced by removing contamination. In general, a more comprehensive cleanup lessens the likelihood that injuries will continue, resulting in a smaller natural resource damage claim. Trustees can consider additional removal of contamination to help meet their restoration goals. If there is no cleanup at all, natural resources can continue to be injured; hence a larger claim for natural resource damages.

Restoration does not need to wait until cleanup activities are complete. The public should be compensated for natural resource injuries as soon as possible, but final restoration efforts should wait until the remediation is finished. Restoration can often be achieved in a more timely fashion if trustees and GE are able to settle; however if litigation must be pursued, it will take considerably more time to restore injured natural resources.

The estimated cost of the Hudson River cleanup is \$500 million, but this does not include GE’s legal obligation to provide natural resource damage restoration. The cost of the cleanup is not part of the NRDA claim.

As part of the cleanup, but separate

from the NRDA there will be a habitat replacement program. Coordinating NRDA work and cleanup-related habitat replacement is essential. Damaged resources not appropriately mitigated, replaced or restored as part of the cleanup effort can be factored into the NRDA claim.

The NRDA Process

The chart on page 12 outlines the Hudson River NRDA process, illustrating the intricacies and numerous components that can make up a NRDA. Each of the steps is described below.

Preassessment Screen

The decision to conduct a NRDA is documented in a preassessment screen. This usually involves a detailed literature search on the effects of the hazardous substance on natural resources. The preassessment determines whether or not there is a link between the hazardous substance and its potential to injure natural resources.

The Hudson River Preassessment Screen, released in October 1997, documents that:

- PCBs were released into the Hudson River
- PCBs have, or are likely to have, adversely affected natural resources
- PCB concentrations are likely to cause potential injury
- Data is available or obtainable at a “reasonable cost” to conduct an assessment
- EPA’s remedy would not completely address injury nor compensate for loss

STATUS OF HUDSON RIVER NRDA

To date, the trustees have:

- Determined that significant evidence exists to link PCBs to natural resource injuries and to pursue a damage claim
- Determined that fish, birds, mammals, amphibians, reptiles and invertebrates as well as floodplain soils, river sediments, ground-water and air have been exposed to PCBs
- Received 350 potential restoration project ideas from the public
- Completed a draft NRDA plan that details the approach for documenting damages to natural resources caused by PCBs
- Begun assessing individual species of birds, fish and mammals for injuries due to PCBs

THE HUDSON RIVER NRDA

PREASSESSMENT – 1997



NATURAL RESOURCE DAMAGE ASSESSMENT – Ongoing



- | | | |
|---|---|---|
| <ul style="list-style-type: none"> • Biological: mammals, birds, reptiles, amphibians, fish, benthic invertebrates • Water, sediment and soils • Recreation (lost use) • Navigation (lost use) • Air | <ul style="list-style-type: none"> • PCB sources to water and sediment • Food web evaluation • Floodplain evaluation | <ul style="list-style-type: none"> • Recreational fishing (lost use) • Habitat equivalency analysis • Navigational services (lost use) • Impacts to national parks and affiliated areas |
|---|---|---|



RESTORATION AND COMPENSATION DETERMINATION PLAN



REPORT OF ASSESSMENT



RESOLUTION OF A CLAIM



RESTORATION PLANNING AND IMPLEMENTATION

NOTE: An NRDA settlement can occur at any time.



While fishing was outlawed along the upper Hudson River from 1976 to 1995 due to PCB contamination, anglers are now permitted to catch fish, but are not permitted to keep them.

The trustees must consider how much it will cost to study the damages to natural resources. Usually a NRDA is conducted only if the trustees determine that the claim will result in recovering monies greater than the study cost. To do this, the trustees develop a “Preliminary Estimate of Damages” prior to performing the NRDA.

The trustees established a preliminary estimate of damages and determined that the Hudson River NRDA can be completed at a “reasonable cost.” Trustees are not required to release the estimate of damages until the NRDA is complete. The Hudson River preliminary estimate has not yet been released.

Hudson River Natural Resources Damage Assessment Plan

A draft *Hudson River NRDA Plan* released in September 2002 outlines the approach the trustees would take to evaluate the nature and extent of Hudson River natural resource injuries caused by GE PCBs. The plan outlines studies needed to document and quantify injuries caused by the hazardous substance release.

The NRDA plan can be modified at any time. While the trustees already had a formal public comment period on the NRDA plan, they are open to receiving additional information regarding their injury assessment work. Citizens are encouraged to submit ideas regarding the lost use of natural resources caused by PCBs and suggestions for how injured resources can be restored.

Opportunities for continued public involvement throughout the NRDA steps are discussed in more detail below.

Hudson River Injury and Pathway Determination Studies

Trustees can use computer models or specific scientific field investigations to assess injuries. The Hudson River injury assessment, which includes primary investigative science, is outlined below.

Interim and Residual Injuries

Past, present and interim injuries may have occurred from the beginning of the PCB discharges in the 1940s to some point in the future. Exactly how far back to go to measure injury is still an unclear part of the NRDA process. This subject is widely debated among trustees. Residual injuries are those that continue into the future after the cleanup.

Trustees must determine if and how an injury occurred due to PCB exposure (injury determination), quantify the injury (injury quantification) and determine the movement of PCBs through the environment to the natural resource (pathway determination).

Hudson River Trustees have begun certain natural resource injury studies. Some injury study plans were released for public review and comment. Additional injury studies should also be released for public review and comment.

NRDA PLAN

The NRDA plan outlines a series of studies the trustees are conducting to determine:

- The past, ongoing and future natural resource injuries from PCBs
- PCB movement through the environment to particular natural resources
- The potential methods of restoration and compensation for lost human uses of specific resources

To get on the Hudson River NRDA mailing list or request a Hudson River NRDA presentation for your group, please contact:

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www.darp.noaa.gov

Keeping up to date via the Hudson-NRDA Listserv

To join the trustees’ listserv and receive email updates every three to five months, 1. Send a message to: requests@williamette.nos.gov. 2. Write “Subscribe hudsonnrda” in the subject line to receive a confirmation email to which you must reply within 24 hours. (For additional resources see Section V.)

1997

Gov. George E. Pataki announces that New York State will join federal agencies to pursue a Hudson River NRDA damage claim.

1997

The National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service and New York State Department of Environmental Conservation — the trustees — begin the NRDA process.

1997

Trustees complete the preassessment and determine that a full damage assessment is warranted.

1998

Trustees release first draft public participation plan.

1998

Trustees organize a focus group to examine public involvement.

1998

Trustees issue a draft NRDA scoping document for public review and comment.

1998

Trustees notify GE of the assessment and seek company's cooperation.

2000

Trustees begin soliciting restoration project ideas from the public.

2001

Trustees release *Injuries to Hudson River Fishery Resources: Fishery Closures and Consumption Restrictions*.

2002

Trustees release *Floodplain Soil and Biota Screening Sampling Report*.

2002

Trustees release second draft public participation plan.

2002

Trustees issue a draft NRDA plan for public review and comment.

2002 and beyond

Trustees continue PCB injury assessment to build NRDA claim.

2004

Trustees release *Draft Study Plan for Year 2004: Avian Investigations* for public review and comment.

?

Resolution of assessment, claim and restoration.

Potential Hudson River Injury Studies

- Amphibian (wood and leopard frogs)
- Bird (sandpiper, kingfisher and tree swallows)
- Snapping turtle
- Fish health
- Effects of PCBs on early life stages of fish
- Evaluation of PCB levels in fish
- PCB sources to sediment and water
- Evaluation of how PCBs move through the food chain
- Evaluation of PCBs in the floodplain

Staying aware of the trustees injury assessment work will help the public better understand and participate in future restoration efforts. To aid in the assessment, members of the public are encouraged to provide trustees with PCB injury-related information.

Damage Determination and Restoration

Another very important, complicated and heavily debated subject is placing a dollar value on the injured natural resources and the loss or reduction in their services. Information gathered in the injury studies is used to identify lost

TYPES OF INJURIES

- Physical deformities
- Reproductive problems
- Increased incidence of cancer in specific species
- Exceeding regulatory standards
- Institutional controls such as fish consumption advisories

human uses and to begin determining how to restore or replace resources. Determining compensation and restoration can be done by establishing the value of injured resources or by calculating the cost of restoration projects, or a combination of both.

To determine damage to a vehicle, as in the automobile analogy, bluebook values can be used. Placing an economic value on a loss of habitat or the inability of an animal to reproduce is much more difficult. Nevertheless, valuation of injured natural resources and costs for replacing and restoring them is an important element of NRDA.

Trustees attempt to place a value on natural resources and the use of those resources through, among other methods, public surveys and models.



The Hudson River Trustees are investigating possible PCB-related injuries to birds such as the sandpiper and kingfisher, and amphibians such as the wood frog.



Notice!

Some **fish** and crabs from these waters may be **harmful to eat.**

Rich Schiafo



Rich Schiafo



Rich Schiafo

The trustees have proposed four damage determination studies:

- **Loss of recreational fishing** – This effort will include an examination of how fishing restrictions due to PCB contamination have likely changed angler behavior and the way they view the river and its fishery.
- **Habitat equivalency analysis** – Once the trustees determine the extent of resources injured, this is a potential method to establish the quantity of restoration that would equal the resources injured and lost.
- **Loss of navigational services** – The trustees will determine if the inability to remove contaminated sediment from the Champlain Canal on the upper Hudson has led to any loss or impairment of the canal's services. Compensation for this loss potentially can be the monetary difference associated with the removal and disposal of contaminated sediment from the canal versus removal and disposal of clean sediment. The trustees also may evaluate how PCB contamination has compromised the navigability of the lower Hudson.
- **Impacts to National Park sites and affiliated areas** – PCBs at these sites may have affected how visitors view these treasured resources. The trustees could study the impacts PCBs have had on Hudson Valley sites – such as Saratoga National Historic Park, the Franklin D. Roosevelt National Historic Site, and the Vanderbilt Mansion National Historic Site.

Restoration and Compensation Determination Plan

After trustees identify the type and extent of injury they will develop a *Restoration and Compensation Determination Plan* (RCDP). This plan will identify, evaluate and document the evaluation of many restoration options, discuss the reasoning behind the preferred alternatives, and detail the costs of restoration activities.

Federal regulations require the trustees release the RCDP for public review.

The public will have at least 30 days to comment on the plan. Reasonable extensions to the public comment period may be granted. The RCDP has not yet been released.

Report of Assessment

The NRDA will culminate in a *Report of Assessment* documenting all the findings from the assessment.

The Report of Assessment will include:

- Preassessment Screen Determination
- Preliminary Estimate of Damages
- NRDA – injury determination and quantification, pathway determination, damage determination and restoration
- Restoration and Compensation Determination Plan
- Public comments received on the entire process

This report will be available to the public for review and input.

Resolution of Claim – Post Assessment

Compensation is then sought from the responsible party, GE, for the lost use of natural resources and compensation for projects designed to restore damaged natural resources. The trustees must present a written damage claim to GE that includes injury assessment costs. This request for damages may include a notice of intent to file a lawsuit. GE has 60 days to respond to the trustees. If a settlement is reached, a consent decree is submitted for court approval and public review. Prior to court approval, the regulations provide **the public at least 30 days to review the proposed settlement. The court is to consider public input.**

Trustees may bring a claim at any point during the NRDA, when they believe they have sufficiently built their case.

Parties Can Settle

Trustees may settle with GE at any time in the NRDA process. A settlement should

outline the amount of money GE must pay or restoration actions it must implement. If a settlement is not reached, a full NRDA, as outlined in this guide, may occur prior to the trustees actually bringing a claim against the responsible party.

Settlement negotiations are private and subject to little or no public scrutiny, underscoring the importance of public participation in the assessment process prior to settlement.

A draft settlement, subject to court approval, should outline the amount GE must pay, including NRDA costs and/or restoration actions it must implement. Prior to court approval, **a 30-day public review and comment period is required for proposed settlements.** The court considers this public input prior to finalizing the settlement.

Once the court signs off, GE has 60 days to respond to trustees' request for payment.

Depending on the settlement, the courts or the trustees hold NRDA funds, but the trustees determine how restoration funds are used. Public input will help shape how the NRDA funds are used.

Filing Suit

If a settlement is not reached, the trustees can file a lawsuit in a federal court against GE seeking funding and/or implementation of the Hudson River restoration plan, which includes compensation for the lost use of natural resources. A claim may include a monetary request and require specific projects designed to restore injured natural resources.

NRDA IS FOR THE BIRDS

- B**aseline – restore resources to condition if hazardous substance had not occurred
- I**njury – how has resource been harmed
- R**estoration – repairing or rehabilitating injured resource
- D**amages – what trustees can prove has been injured; amount of money sought for injury and loss
- S**ervices – lost human use of the resource

Restoration Planning and Implementation

Once the claim is settled or a judgment issued, a *Restoration Plan* will be prepared by the trustees that outlines a process for deciding how NRDA monies will be used to restore, rehabilitate, replace or acquire the equivalent of the injured Hudson River natural resources. This plan will be based on the RCDP if one has been prepared earlier in the NRDA process.

The plan will establish restoration goals, priorities, and criteria, as set forth in the regulations, to evaluate and select restoration projects. Evaluation criteria will include such things as technical feasibility and cost-effectiveness. The plan also may outline the trustees' preferred restoration options and specific chosen projects.

Before a *Restoration Plan* can be approved it must be released to the public for review and comment. Because injuries to natural resources can have a direct impact on their use and enjoyment by the public, trustees usually encourage public participation in the restoration planning process.

NRDA monies recovered for restoration of injured resources can either be put in a separate account in the federal or state treasury, or the responsible party can place the funds in an interest-bearing account payable in trust to the federal or state-designated trustee.

Soliciting Restoration Ideas

Federal regulations allow for trustees to publicly solicit restoration ideas during the NRDA and include them as part of this plan. Hudson River Trustees began solicit-

ing ideas in 2000 and remain interested in receiving Hudson River restoration suggestions from the public. Please see the *Restoration Proposal Form* in Appendix B.

LESSONS LEARNED

- Trustees' goal is to restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources.
- Documenting injury due to the release of PCBs is complicated and difficult.
- The ultimate objective of the Hudson River NRDA is restoration of natural resources to address both lost human uses and the ecological health of the entire Hudson River watershed.
- Burden of proof is on the trustees to prove injury to natural resources due to GE PCB contamination.
- Trustees have identified certain Hudson River natural resources that have been injured, can be quantified and restored.
- Trustees are currently engaged in a lengthy series of original scientific studies to determine how natural resources have been damaged by PCBs.
- At any time during this assessment the trustees and GE may settle this NRDA case.
- If an NRDA settlement cannot be reached, detailed scientific injury assessment will continue for several years, and restoration will take considerably more time.
- While the NRDA process can be long and time-consuming, it is a powerful tool for restoring Hudson River natural resources injured by PCBs.
- There are fixed points where public involvement is required by law in the NRDA; however, early participation can ultimately enhance restoration efforts.
- Trustees should encourage public input to garner support for restoration goals.
- Cooperation between GE and trustees is encouraged.

Cooperative Assessment

NRDA regulations encourage cooperation between the trustees and the responsible party in assessing and restoring natural resource injuries. Cooperative assessments can result in a more timely evaluation and restoration of injured natural resources. An NRDA not conducted cooperatively can result in ongoing injuries, cost more and take longer.

The trustees have reached out to GE to urge the company to work with them on the Hudson River NRDA. At this point GE has not expressed interest in conducting the assessment cooperatively, nor is there any public indication of a NRDA settlement in the near future. GE's commentary indicates that the trustees will need to conduct a full assessment and pursue damages in court. In a March 20, 2004 Poughkeepsie Journal article regarding the trustees' bird injury studies, a GE spokesman stated – "We're very early in what we expect will be a very long scientific and legal process."

If the trustees and GE agree to cooperate on any or all of the assessment, the public is to be kept informed of any such arrangement. In the cooperative process it is essential that trustees actively seek to engage non-governmental organizations, community representatives, environmentalists and other stakeholders in the assessment.



Rich Schiafo

Concrete structures like this in the upper Hudson River typically offer no fish or wildlife habitat value. Softening such shorelines can restore those habitats.

Section II. GENERATING HUDSON RIVER RESTORATION PROJECTS

Summary

While restoration will not occur until the NRDA claim is settled, either through negotiation or litigation, Hudson River NRDA restoration planning has already begun. Hudson River Trustees have been soliciting restoration project ideas for the past few years. This section is designed to encourage citizens to participate in NRDA restoration planning by submitting restoration ideas to the Hudson River Trustees. Knowledge and understanding of the following can help the reader think about and generate restoration ideas for the Hudson River.

- Hudson River injury studies that are complete, in progress or proposed
- NRDA restoration project ideas that have already been suggested for the Hudson River
- NRDA restoration efforts that have and have not worked at other hazardous substance sites

Community Participation in NRDA and Restoration Planning

Public involvement opportunities in NRDA vary from site to site with citizen participation dependent on site-specific factors ranging from cooperation among trustees, cooperation among trustees and the responsible party, the extent of outreach by the trustees and the extent to which citizens are proactive and organized. An engaged, active and interested public can hold trustees and responsible parties accountable in their efforts to address injury and restore resources.

Citizens, local elected officials, county environmental management councils and various appointed officials such as members of local planning boards, conservation advisory councils and local waterfront revitalization programs are encouraged to actively engage in the process.

Trustee restoration goals will be more readily achieved if the public is informed and engaged in restoration planning and there is recognition of the connections between local community

concerns and ecosystem-wide natural resource restoration.

Trustees are aware that they can build trust and support for restoration by involving the public in the NRDA process. Incorporating public input can result in more effective and efficient restoration planning.

Thinking Holistically

Officials and others concerned about restoration are encouraged to think beyond local boundaries and consider developing restoration projects that benefit the overall watershed. Restoration projects can be specific in location, but broad in scope and impact.

Restoration planning creates opportunities for communities to work collaboratively to develop restoration initiatives that will benefit the ecological health of the entire Hudson River ecosystem. Community-based restoration efforts that keep local officials involved through design and implementation are typically the most effective. They also promote local stewardship.

Natural resource restoration efforts traditionally focus on the estuarine portion of river systems, as they have for the Hudson River. However, the non-estuarine headwaters of the Hudson River are vitally important. NRDA prompts consideration of projects that could benefit the entire length of the Hudson River and its ecosystem. The same ecological attention and protection now paid to the Hudson River estuary can be garnered for the upper reaches of the river through the Hudson River NRDA.

What is Restoration?

According to Restore America's Estuaries, a national nonprofit organization, "restoration" is "returning an area... to a successful, self-sustaining ecosystem with both clean water and healthy habitat that support fish and wildlife and human uses...such as swimming, boating and recreational and commercial fishing.

WHO SHOULD PARTICIPATE IN THE HUDSON RIVER NRDA

- State, county and local elected officials
- County environmental management councils
- County and local planning boards
- Conservation advisory councils
- Local waterfront revitalization program committees
- Community-based groups concerned about ecological health and natural resources
- Environmental and conservation organizations
- Any citizen interested in ecological health and natural resources

Restoration is restoring an area to a successful, self-sustaining ecosystem with both clean water and healthy habitat that support fish and wildlife and human uses.

Restoration usually does not focus on a single species but strives to replicate the original natural system. The goal is to help rebuild a healthy, functioning system that works like it did before it was polluted or destroyed. Restoration also means an actual increase in – habitats, as measured both by acreage and by ability to support fish and wildlife.”

The EPA defines “restoration” as “the return of an ecosystem to a close approximation of its condition prior to disturbance. In restoration, ecological damage to the resource is repaired. Both the structure and the functions of the ecosystem are recreated. The goal is to emulate a natural, functioning, self-regulating system that is integrated with the ecological landscape in which it occurs.”

Types of NRDA Restoration

NRDA restoration can either be primary or compensatory. Primary restoration involves changing the physical, chemical or biological conditions with the intention of restoring a natural resource to its baseline condition.

In addition to the physical restoration of injured resources, compensatory restoration is when payment is sought for the lost use provided by a natural resource. Compensatory restoration is the amount of money required to compensate the public for the lost use of a resource and the services the resource provided from the time of injury until full restoration. Enhancing resources or providing replacement resources is considered compensatory restoration.

Submitting Hudson River NRDA Restoration Project Ideas

Restoration projects can:

- Enhance water quality
- Improve recreational fishing
- Improve river access
- Protect local streams or wetlands
- Protect and preserve land
- Protect or restore specific habitats
- Protect or restore certain species

of fish, mammals, birds, reptiles or amphibians

A *Restoration Proposal Form* can be found in Appendix B.

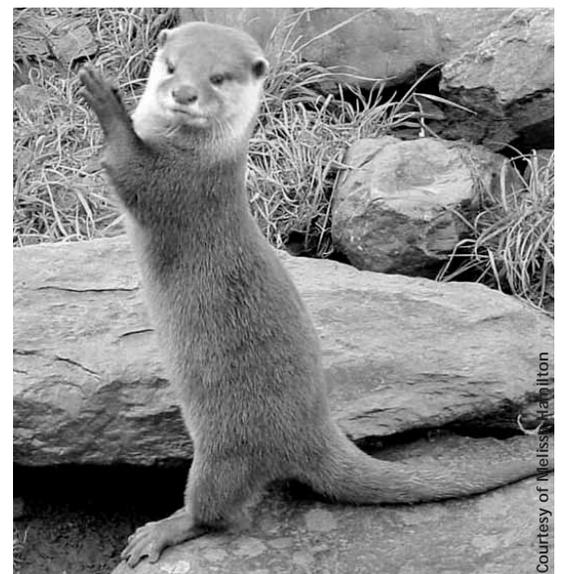
Hudson River Injuries and Generating Restoration Projects

Understanding the types of natural resource injuries the trustees are examining can help the reader to creatively think about restoration project ideas. Project proposals can address, but are not limited to, restoring mammals such as mink, restoring birds such as the spotted sandpiper and belted kingfisher, restoring snapping turtles, restoring recreational fishing opportunities, and improving water quality. The injuries being studied by the Hudson River Trustees are discussed in Section I and below.

Injury to Mink

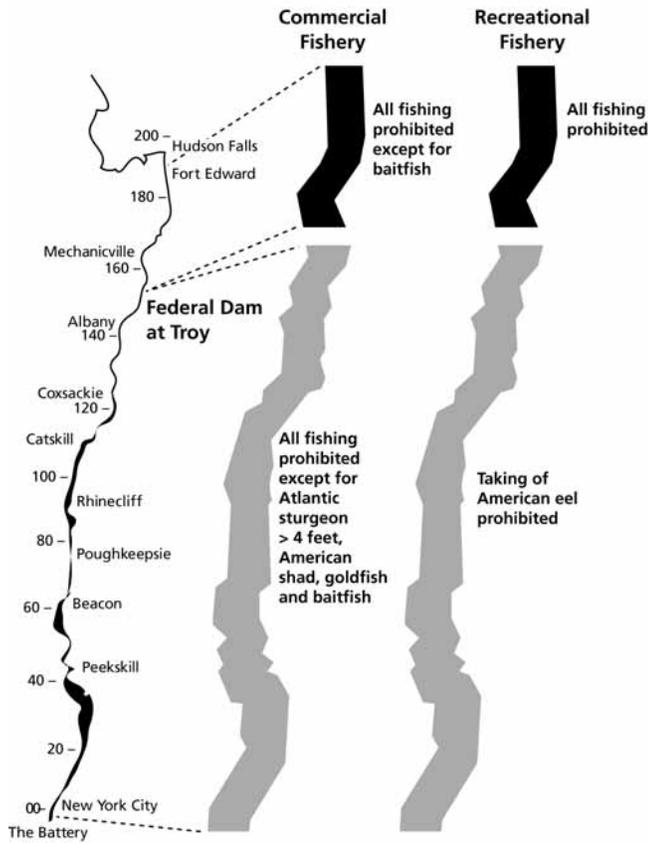
Trapping and tracking results document that there are fewer mink in the area around the Hudson River as compared to similar ecological systems.

Mink generally accumulate PCBs by eating contaminated fish. Trustees have found that Hudson River mink are more highly contaminated than mink in other areas. According to the trustees, existing data

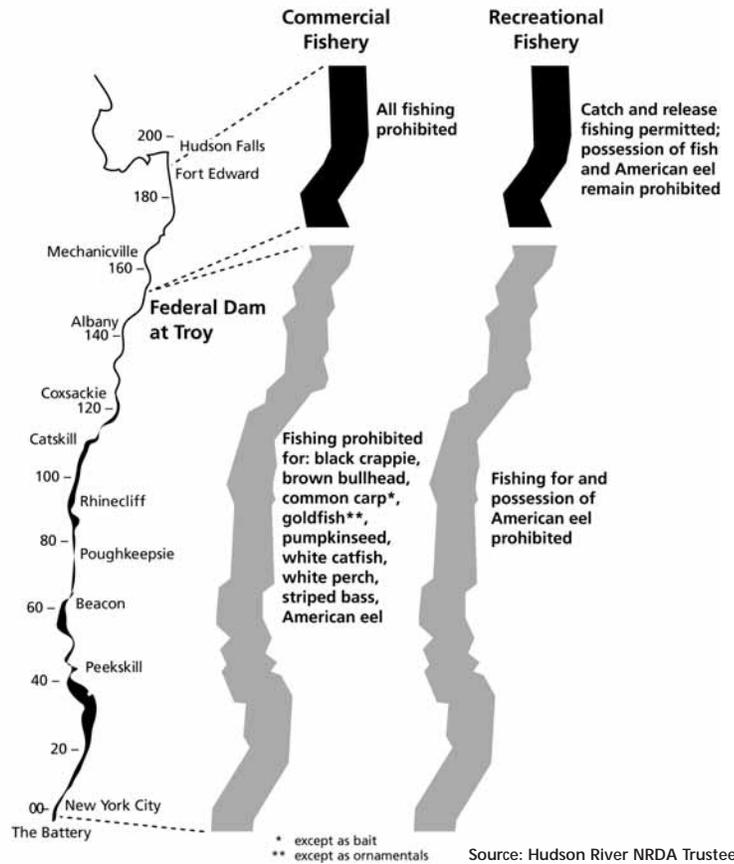


The rarity of mink in the Hudson watershed may be attributable to PCB contamination.

HUDSON RIVER FISHERY CLOSURES IN 1976



HUDSON RIVER FISHERY CLOSURES FOR 2000-2001



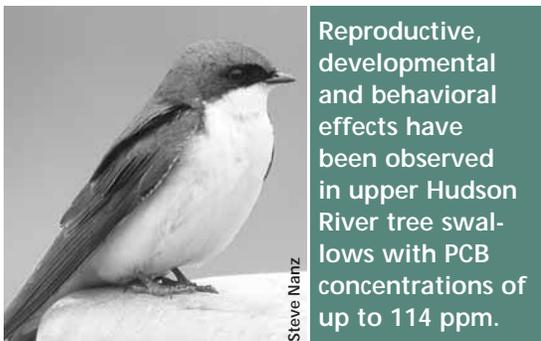
Source: Hudson River NRDA Trustees

suggest that mink are more sensitive to PCB exposure than most other mammals and, at certain levels, PCBs can adversely affect their ability to reproduce.

Bird Injuries

Preliminary investigations of certain Hudson River birds revealed high concentrations of PCBs in the eggs of the belted kingfisher and the spotted sandpiper. Spotted sandpipers have the highest individual egg concentrations of PCBs at 56 parts per million (ppm).

For comparison purposes, contaminated



Reproductive, developmental and behavioral effects have been observed in upper Hudson River tree swallows with PCB concentrations of up to 114 ppm.

Steve Nantz

Hudson River sediment that is more than 50 ppm will be classified as hazardous and must be handled and disposed of in a toxic waste landfill. Therefore, tree swallow and spotted sandpiper eggs could be classified as hazardous waste. Regardless of such high PCB levels, the burden lies with the trustees to prove this contamination causes injury to these birds. Trustees are currently attempting to determine if reproductive or other injuries are tied to PCB exposure.

Fishery Closures and Consumption Advisories as an Injury

From 1976 to 1995, due to PCB contamination, recreational fishing in the upper Hudson River from Hudson Falls to the Troy Dam was prohibited. It is still illegal to keep fish, although anglers are now allowed to catch and release the fish. Due to health implications of PCBs, since 1976 the New York State Department of Health

Since 1976 PCBs have resulted in a variety of fishing bans and restrictions placed on the Hudson River fishery as depicted above.



Dave Menke, Courtesy of Audubon

Rich Schiafo

Hudson River Trustees have received suggestions to use NRDA to, in part, clean up brownfields, enhance habitat for raptors and restore natural stream channels.

The New York State Department of Health advisories warning anglers about fish consumption have existed along the Hudson River for almost three decades.

(DOH) has advised women of childbearing age and children under 15 not to eat any fish from any location along the Hudson River. Health advisories in place along 200 miles of the river interfere with and compromise recreational and subsistence fishing. The risks to human health and wildlife in the Hudson Valley from PCB exposure far exceed protective standards.

The DOH advisories warning anglers about fish consumption have existed along the Hudson River for almost three decades. The trustees have concluded that these fishing restrictions are an injury according to NRDA regulations. The trustees have documented the extent of this injury in a report, *Injuries to Hudson River Fishery Resources: Fishery Closures and Consumption Restrictions*, June 2001.

Snapping Turtle Injury

Hudson River snapping turtles have high levels of PCBs, up to 3,092 ppm. The



Thomas Strömberg

Studies at other sites have shown that PCBs affect sex differentiation in snapping turtles and reduce hatching success in eggs.

trustees are examining how contamination may adversely impact the turtles.

In addition, there are snapping turtle consumption advisories. The trustees must determine the extent to which Hudson River PCBs contributed to the need for these advisories.

Exceeding Important Standards as Injury

Exceeding federal or state environmental protection standards is considered an injury. Some standards that are regularly exceeded:

a. Water Quality Injury

The trustees have found that PCBs in Hudson River water consistently surpassed applicable federal and state water quality standards. PCB levels in the water routinely exceed the standards that are designed to protect those who want to catch and consume fish. Further work is being done to quantify this injury.

b. Surface Water Injury

PCB levels in Hudson River sediments possibly surpass thresholds designed to protect animals that live in the sediments and animals that feed on sediment-dwelling organisms. These PCB concentrations may be causing injury to these natural resources. The trustees are continuing this investigation. If PCBs are shown to have injured animals that live in the sediments it is considered a surface water injury.

Hudson River Restoration Project Proposals

The Hudson River Trustees started soliciting restoration project ideas from the public in 2000. The trustees have sorted project ideas according to following four 'benefit' categories:

- Habitat Improvement
- Environmental Quality Enhancement
- Species Enhancement
- Human Use Improvement

Many of the proposed projects fall into more than one category. Ideas already submitted, summarized in the list on page 24, may help generate additional thoughts.

How to obtain the current list of Hudson River Restoration Proposals

The trustees have created a database of restoration proposals that, as of January 2004, contained more than 350 possible restoration project ideas. The list of projects is available by contacting:

Lawrence Gumaer

NYS Department of Environmental
Conservation

Natural Resource Damages Unit

625 Broadway, Albany, NY 12233-4756

Phone: 518-402-8971

Fax: 518-402-9027

lwgumaer@gw.dec.state.ny.us



Rich Schiafo

Removal of dams or use of fish ladders can help improve fish migration and enhance fishing thereby addressing the loss of recreational fishing opportunities due to the release of PCBs into the Hudson River.

Habitat Improvements

- Construct detention basins
- Control erosion/sedimentation/rip-rap along tributaries
- Control invasive plant species (phragmites, purple loosestrife, water chestnut)
- Enhance tidal exchange/improve tidal flow
- Increase fish habitat through vegetation
- Limit railroad use of herbicides
- Monitor rare and endangered species communities
- Monitor sewage loading
- Control nonpoint source pollution
- Re-establish natural vegetation
- Remove bulkheads
- Remove dredge spoils (from areas such as Rogers Island)
- Repair seawalls
- Restrict access through vegetative buffer
- Restore upland and tidal marshes
- Restore hydrologic function – clear/repair culverts, improve flow, restore natural channels
- Restore wetlands
- Stabilize banks

Species Enhancement

- Add baffles to make pools at low flow
- Add raptor habitat elements
- Monitor/reduce agricultural runoff
- Clean up trash
- Construct fish ladders
- Create a Hudson Riverkeeper organization for the upper Hudson
- Create artificial nesting structures
- Create environmental education centers

- Develop an ecological community inventory and a methodology for the valuation of ecological communities on the Hudson
- Develop a database that could help to identify restoration sites
- Enhance pollutant uptake through vegetation
- Preserve habitats with rare and endangered species and/or significant biodiversity
- Remove dams
- Remove obstructions for migratory fish
- Restore herring runs
- Restore oyster beds
- Restore striped bass fishery and spawning population
- Restore waterfowl habitat

Environmental Quality Enhancements

- Dredge PCBs and render them harmless
- Establish environmental education/stewardship program for children
- Establish urban/suburban stream buffers
- Implement estuary plan
- Preserve freshwater intertidal habitats
- Provide technical assistance to planning boards to evaluate impacts of local land use projects on habitat and water quality
- Remove culverts, replace with bridges

Human Use Improvements

- Clean up abandoned brown-fields to improve water quality and river access
- Create community vegetable gardens in low income/minority neighborhoods (loss of Hudson River fish as a food source)
- Create educational and vocational training center with environmental and maritime field focus for BOCES students

- Create environmental education programs for children
- Create/establish hiking/biking trails
- Create parks
- Create public facilities to provide alternatives to shoreline recreation in waterfront neighborhoods
- Create/improve docking facilities
- Create wetlands
- Construct trails/interpretive signage
- Develop a marina, conference center, and recreational uses
- Develop environmental education centers
- Develop nature trails
- Dredge boat channels, creeks, Champlain Canal (for navigational purposes)
- Establish boat launches/boat ramps
- Establish greenways
- Establish industrial park/redevelop mill for business use/light industrial use
- Establish picnic areas
- Establish viewing areas (scenic overlooks)
- Establish wildlife observation areas
- Fund acquisition of farmland
- Improve handicapped access to existing parks, recreational areas
- Increase access for recreational fishing
- Increase public outreach on environmental issues
- Protect land through land acquisition/conservation easements/land preservation
- Provide docking/pump-out/water facilities for boaters
- Stabilize historic canal structures
- Strengthen village ties to waterfront by making streetscape improvements in commercial areas

This list is based on the Hudson River Natural Resource Damage Trustee January 2004 interim draft of the Hudson River Restoration Project Proposals received from the public. This list is sorted based on the “benefit” of the project as categorized by the trustees.



Steve Nanz



Rita D. Shaheen



David Diaz

Outdoor classrooms, such as this one along Black Creek, can help enhance restoration efforts of frogs and owls that may have been injured by PCBs.

Restoration Projects at Other Sites

Another way to help generate restoration project ideas is to examine restoration projects approved at other sites. Such restoration projects that have met NRDA criteria primarily involve habitat protection and enhancement. Below are some examples from the New Bedford Harbor Mass. and Lower Fox River Wis. sites. A comprehensive list from these sites can be found in Appendix A. More detailed descriptions of these NRDA sites are found in the next section.

New Bedford Harbor Restoration Projects

- Eelgrass habitat restoration – survey eelgrass, identify eelgrass habitat, select priority areas for restoration, plant eelgrass to provide fish and shellfish habitat
- Purchase 160 acres – the largest undeveloped, uncontaminated parcel of coastal property in the harbor
- Purchase and establish conservation restriction on specific properties
- Aquarium exhibit on PCB impact to natural resources

Lower Fox River Restoration Projects

- Re-establish wetland and associated upland habitat to restore native ecosystems used by grassland birds, waterfowl, and waterbirds, specifically the sandhill crane
- Wetlands restoration – replacing wetlands to provide suitable spawning

and waterfowl habitat

- Acquire and protect significant habitats –169 acres to protect headwater streams and wetlands
- Restore and enhance lake sturgeon spawning habitat in the watershed

Nexus

Restoration projects must have some connection to the injury caused by PCBs. One of the better understood injuries are the restrictions on the Hudson River recreational fishery due to PCB contamination. Therefore, improving fishing access to uncontaminated fish would be an appropriate restoration project. Another example is that mink are believed to be rare along the upper Hudson River due to PCB contamination. Restoration projects to protect mink habitat and restore the mink population may also be appropriate ideas. The connection to the injury will be important in project selection.

The projects eventually funded with NRDA monies will be more limited. Factors affecting the trustees final selection of restoration projects will include the amount of the NRDA settlement and the connection or ‘nexus’ of the project to the injury.

NRDA funds cannot be used for any restoration effort. NRDA funds must be used to restore, rehabilitate, replace, and/or acquire the equivalent of the injured resources. Restoration projects must be linked to the injury caused by

“NRDA funds must be used to restore, rehabilitate, replace, and/or acquire the equivalent of the injured resources. Restoration projects must be linked to the injury caused by PCBs.”



The Hudson River Trustees have received suggestions to use NRDA funds to provide environmental education opportunities in the Hudson Valley.

PCBs. This link or nexus is continually debated and remains to be determined as the Hudson River NRDA Trustees are still assessing the injuries. At this point, it is unclear how much or when NRDA restoration monies will be available for the Hudson River.

Controversial Projects at Other NRDA Sites

While generating restoration project ideas, it helps to understand the suggestions that sparked controversy and resistance at other sites. These controversies further underscore the need for a nexus, or link between the injured resource and the proposed restoration project.

Recreation

While creating public access to waterways or providing compensation for the loss of recreational fishing can provide benefits for human use of the resource, using NRDA funds for recreational initiatives can be contentious.

A proposal to allocate NRDA funds for a park in New Bedford, Mass., was supported by some, but opposed by those who thought there was no link to the injury. The trustees recognized that PCBs resulted in a loss of recreational opportu-

nities and approved NRDA funding for the park. However, due to limited NRDA work, the trustees recommended additional study to determine the scope of lost recreational uses.

At the Fox River, Wis., site, trustees set a goal of spending less than ten percent of NRDA settlement funds for public-use enhancement projects. They indicated that such projects could direct high-intensity public activities away from ecologically sensitive areas and appropriately compensate for PCB-caused losses. Still, the trustees did not want public-use enhancement projects to dominate NRDA restoration spending.

Education

NRDA funds cannot be used directly for education unless a direct connection can be made to the injury.

The New Bedford Harbor Trustees approved funding for a PCB exhibit at a proposed aquarium because the exhibit is designed to instruct visitors to change their everyday behavior and routines in ways that positively impact the harbor and its natural resources. It is anticipated that by conducting before and after attitude surveys, quantifiable changes in behavior could be measured.

LESSONS LEARNED

The Lower Fox River Trustees indicated that proposals that include environmental education as a component of habitat protection or restoration should meet the restoration selection criteria. However an environmental education project proposed without a habitat component would not restore, replace, and/or acquire the equivalent of injured natural resources.

Water Quality

Although exceeding water quality standards clearly indicates injury, using NRDA funds to monitor and improve water quality at New Bedford Harbor was contentious. While some monitoring money was initially approved, it has not been funded.

One of the most significant issues at New Bedford Harbor was restoration of shellfish beds injured by PCBs. Although more than 500 commenters requested NRDA funds for sewer projects, the trustees would not approve this without further studies to determine if the proposed water quality improvement projects would benefit shellfish. This response underscores the need for creating the nexus or link between the proposed project and the injury.

Additional Removal of PCBs

Debate still surrounds using NRDA monies for additional removal of contaminants above and beyond the cleanup action. The EPA cleanup is based on protecting public health. Removing contamination as part of the NRDA would serve to restore, replace or rehabilitate injured natural resources.

Supplemental removal is often characterized as restoration dredging, as opposed to remedial dredging. Hudson River Trustees have supported a more aggressive cleanup than the one chosen by the EPA. The trustees have indicated that the EPA's remedy would leave behind contamination that would continue to injure natural resources, and therefore, may consider the need for restoration dredging.

- The most significant role that the public can play in NRDA is through the generation and submission of restoration project ideas.
- The restoration planning and implementation facet of NRDA is more amenable to public participation than the injury assessment work.
- Public input is important in identifying injuries, but broad-based participation in NRDA restoration planning is paramount because it will directly determine how successfully natural resources are restored.
- Citizens, community-based organizations, and local officials all along the Hudson River are encouraged to provide Hudson River restoration project ideas.
- Understanding injury assessment is useful in generating of restoration project ideas.
- Fish consumption advisories due to PCB contamination that have resulted in lost opportunities for recreational fishing are a clear example of an injury.
- Examination of Hudson River restoration projects already submitted can be useful in spurring additional restoration ideas.
- Examination of projects approved at other NRDA sites is also useful in identifying appropriate restoration projects.
- Full, active participation will help ensure that adequate compensation and restoration is received for injuries and lost use of Hudson River natural resources due to PCBs.
- Early participation can put citizens in a better position to advocate for specific restoration initiatives
- Restoration can take many forms, including creating and improving fish habitat to provide uncontaminated fish for anglers, protecting endangered or rare species, or preserving areas that attract owls, eagles or other birds.
- Restoration projects can possibly seek to protect and enhance water quality of the Hudson River and its tributaries.
- Restoration projects must have some nexus or connection to the injury caused by PCBs in the Hudson River. As long as the proposed project can be tied to the lost resource in some way, it may be considered as a suitable river restoration project.

Additional removal also was considered as an NRDA restoration alternative on the Lower Fox River. In their review of restoration options, this idea was dismissed because it was determined that the EPA and the State of Wisconsin removal efforts were sufficient.

Since cleanup negotiations between GE and the EPA are private, and the Hudson River PCB cleanup agreement has not been finalized, the extent of PCB removal from the Hudson River is undecided. To what extent trustees may want to remove additional PCBs to protect natural resources is also uncertain.

SECTION III – CASE STUDIES

Summary

The following case studies explore some of the many approaches to natural resource damage assessment, settlement and restoration. Each study includes a brief site description and history; identification of the assessment and settlement process utilized; the process employed in identifying, reviewing and choosing potential restoration projects; and the public's role in restoration project identification, selection and implementation.

These profiles are presented to help those concerned about Hudson River restoration better understand the types of projects that can be realized under NRDA, the importance of assessment, pitfalls to avoid, and the importance of early and active participation.

SECTION III NEW BEDFORD, MASS. CASE STUDY

New Bedford Harbor Facts

- Urban tidal estuary
- Located at the mouth of the Acushnet River on Buzzards Bay in southeastern Massachusetts.

PCBs and Metals – No Fishing and Swimming

Past industrial disposal practices by Aerovox Inc., Belleville Industries, AVX Corp., Cornell-Dubilier Electronics (CDE), and Federal Pacific Electric Co. contaminated the New Bedford Harbor and the Acushnet River with PCBs and heavy metals. The harbor was listed as a federal and state hazardous waste Superfund site in 1983. Due to PCB contamination, the Massachusetts Department of Public Health closed the harbor to all fishing in 1979 and swimming in 1982.

Two Records of Decision, in 1990 and 1999, resulted in a variety of actions over the years, leading to the removal of approximately 46,000 cubic yards of contaminated sediment from the harbor. Local controversy regarding the incineration and disposal of contaminated sediments resulted in changes to the decisions, and now most waste is being sent to a permitted hazardous waste landfill.

Settlements in 1991 and 1992 required the responsible parties to pay \$100 million for cleanup and restoration.

Full-scale harbor dredging is expected to begin in fall 2004. Settlement cleanup monies, however, have already been exhausted. Depending on available EPA funding, the harbor cleanup could take seven to 20 years. The remediation of this site is being overseen by the EPA, assisted by the U.S. Army Corps of Engineers (ACOE), and the Massachusetts Department of Environmental Protection.

Since the project is ongoing, it is important that cleanup and restoration activities be closely coordinated.

Minimal NRDA Work Done

Limited injury assessment was done at this site. Recreational beach loss, injuries to the fishing-lobster industry, and real estate values were examined during the 1980s. The assessment methodology used is unclear. Some dollar figures were attached to the assessment, but there was no clear idea how NRDA monies would be spent.

Regardless, the trustees concluded that significant ecological injury had been caused by the contamination and will continue for some time.

Pioneering NRDA Case

The New Bedford NRDA claim was one of the earliest cases, having been initiated in a federal district court in Boston in 1983.

In 1987 a settlement was proposed with one party, the AVX Corp.,



for \$2 million. The National Wildlife Federation (NWF) on behalf of its New Bedford-area members challenged the low settlement figure. The court upheld the settlement finding that CERCLA does not require recovery of the full restoration and replacement of the injured natural resources. The courts ruled the settlement was fair, reasonable and in the public interest and that trustees are not required to negotiate the best possible deal. NWF's intervention was important, however, in that the court implicitly recognized that public involvement in NRDA proceedings is in the public interest.

In 1992 all five responsible parties settled their liabilities for natural resource damages. Of the \$100 million total settlement, approximately \$21 million applied to restoration of natural resource damages. The estimated natural resource damages were later revealed to be closer to \$70 million.

Restoration Planning at New Bedford

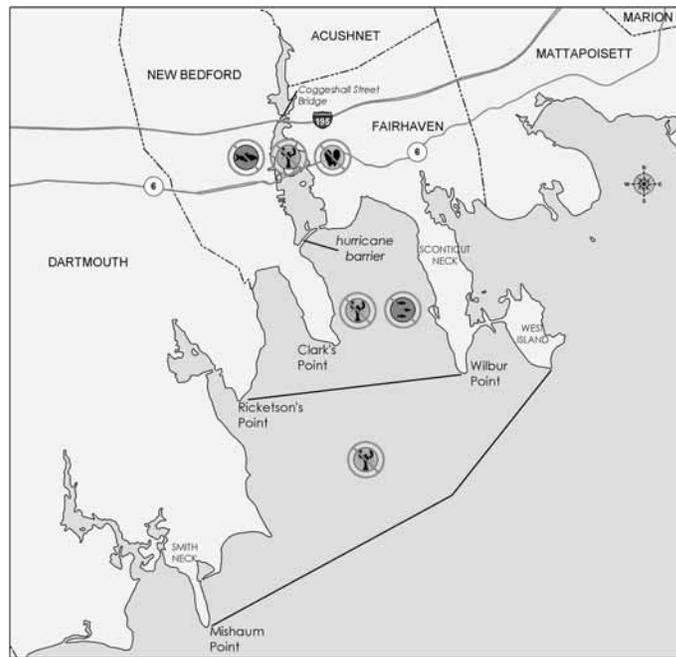
The primary goal of the trustees is to “restore, replace or acquire the equivalent of the natural resources injured by PCB contamination.”

The trustees take a holistic approach to restoration that applies to the entire estuary. Their hope is to use restoration activities to develop public awareness of the ecological and economic state of the harbor to show how pollution affects citizens' everyday life; and to enhance the harbor environment through community involvement.

Trustee Restoration Priorities

- Marshes or wetlands
- Recreational areas
- Water column
- Habitats
- Living resources
- Endangered species

Fish Smart ... Read This Chart !



Source: USEPA

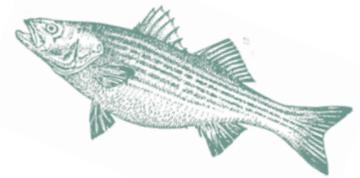


Marlena Marallo

- Don't eat any fish
- Don't eat any lobster
- Don't eat any shellfish
- Don't eat any bottom fish (flounder, scup, tautog and eel)

Produced By The US EPA New England GIS Center
30-May-2003

To date two restoration planning rounds have been completed, with trustees contemplating a third.



Round I – 11 Projects Chosen

In 1995 the trustees publicly sought ideas for restoring natural resources through notices in the *Federal Register* and the *Massachusetts Environmental Monitor*. Federal and state agencies, private businesses, academic institutions, municipalities, nonprofit organizations and citizens submitted 56 restoration ideas totaling \$76 million.

Approved restoration projects included:

- Eelgrass Habitat Restoration – survey eelgrass within the harbor, identify eelgrass habitat, select priority areas for restoration, and plant eelgrass in these areas to provide fish and shellfish habitat.
- Herring Run Restoration – repair fish ladders at the Acushnet Sawmill, Hamlin Street Bridge and the dam at the outlet of Old New Bedford Reservoir and transplant river herring into a mid-water pond.
- Scotcut Neck Land Purchase – purchase 160 acres on Scotcut Neck, Fairhaven, the largest undeveloped,

NEW BEDFORD HARBOR TRUSTEE COUNCIL

- U.S. Department of Commerce
- U.S. Department of the Interior
- Commonwealth of Massachusetts

uncontaminated parcel of coastal property within the New Bedford Harbor environment.

(See Appendix A for a complete list of approved projects).

The selection criteria listed below is useful in understanding NRDA-related restoration and can help generate future restoration project ideas.

Restoration Projects Selection Criteria Priority projects will be:

- Within the New Bedford Harbor environment
- Within the affected marine ecosystem that will have a direct, positive impact on the harbor environment
- Those that give the largest ecological and economic benefit to the greatest area or greatest number of people
- Those that employ proven technologies with high probability of success

Projects should:

- Restore the injured natural resources and associated activities of the area
- Ultimately enhance the public's ability to use, enjoy or benefit from the harbor environment
- Enhance the aesthetic surroundings of the harbor environment to the greatest extent possible, while acknowledging the ongoing industrial uses of the harbor
- Identify or measure ecological or economic effects, so changes to the New Bedford Harbor environment can be documented
- Be cost-effective
- Provide an opportunity for community involvement that can continue even after the trustee actions have ended



Marlena Marallo

Public Involvement: Round 1 Community Restoration Advisory Board

To help ensure that community interests were represented in the restoration planning process, a 15-member Community Restoration Advisory Board (CRAB) was created. In addition, a Technical Advisory Committee (TAC) was created to help evaluate restoration project proposals.

The role of the CRAB was to represent the community in the restoration process, to seek the viewpoints of community members and to advise the trustees on public opinion.

The Purpose of CRAB:

- 1. Act as a link between the trustees and the community:**
 - Report the trustees activities to groups and individuals in the community.
 - Inform the trustees on the positions and opinions of these groups and individuals
 - Participate in outreach efforts by being a “spokesperson” during events, such as slide shows, exhibits, etc.
- 2. Review and make recommendations on the design and implementation of the outreach plan for the trustees:**
 - Review and make recommendations on all potential outreach materials such as pamphlets, videos, fact sheets, etc.
- 3. Review and make recommendations to the trustees at the following stages of the process:**
 - During the request for restoration ideas process
 - During the emergency restoration determination process
 - During the environmental impact statement process, and at other appropriate times
- 4. Assist the trustees in implementing restoration projects.**

Public Meetings and Comments

The trustees held a public information meeting in four different harbor area communities. More than 100 people attended the sessions and dozens of comment letters were received.

Interestingly, GE, which was not one of the responsible parties at this site, questioned the ability of the trustees to select restoration projects based on limited injury assessment work. In response, the trustees indicated that once a settlement had been reached, it was most appropriate to expend recovered funds on restoration of natural resources, rather than on completion of a lengthy and expensive damage assessment.

Controversy Surrounds First Phase of Planning

Trustees, the CRAB and the TAC all seemed to define restoration differently.

The CRAB questioned the criteria chosen to select restoration projects as well as specific project ideas. A lack of acknowledgment and recognition of the board's recommendations led to friction among members and a general feeling that they were used as pawns or a shield for the trustees.

Some CRAB members wanted considerably more input and perhaps more say in the final selection of restoration projects, as did a local community-based organization, who believed that the people should select the projects.

The trustees, however, indicated that the ultimate responsibility for judging how to best accomplish restoration and final decision-making on projects rests with the trustees.

There was also considerable debate over the "nexus" or connection of the proposed restoration project and the injury caused by PCBs. Using NRDA funds for projects pertaining to water quality improvement, education and park development and recreation were disputed. Funding for a PCB education exhibit and a local park were approved, while sewer



Martina Marallo

projects to improve water quality and an indoor pool to replace the lost use of a closed beach were not.

Public Involvement: Round II

A call for a second round of restoration project ideas began in August 1999, culminating in a decision in January 2001. In addition to publishing a notice in the *Federal Register* calling for restoration project ideas, the trustees held two public hearings to gather ideas and comments.

The trustees received 35 project ideas totaling approximately \$35 million. Following a public meeting and more than 650 comment letters, 17 of the 35 proposed projects were chosen.

Approved restoration projects included:

- Acushnet River Valley Land Conservation Project – The purchase of either a fee interest in, or conservation restriction for three parcels totaling approximately 208 acres of land along the Acushnet River.
- Aquarium Exhibit on PCB Impacts to Natural Resources – 1) explain PCBs and examine the effects of PCB contamination on natural resources, and 2) educate visitors to change their everyday behavior to have a positive

LESSONS LEARNED

- Minimal assessment work puts trustees at a disadvantage in restoration planning with no clear plan on how to spend settlement funds.
- The advantage of NRDA is that it can create a list of project ideas and can help with setting direction and goals for restoration.
- Minimal NRDA can result in settlement funds having to be spent on injury assessment studies in order to implement restoration projects.
- Citizen Advisory Boards must have a well-defined role to be effective.
- Holistic approach to restoration is preferred.
- Early, active public participation can help meet restoration goals.
- NRDA cases usually are a series of compromises.
- Compensation can be considerably less than estimated cost of damages.
- Connection of injury to restoration continues to be debated and defined.
- Restoration planning can offer lessons for other NRDA sites.
- Third-party project ideas require trustees to expend resources to find a party to implement the project.
- Experience in public involvement, restoration project selection and efficiently expending NRDA funds are useful lessons for other NRDA sites.

impact on the Harbor and its natural resources

- Marsh Island Restoration – Restoration of the salt marsh at Marsh Island, Fairhaven.

(See Appendix A for a complete list of approved projects.).

CRAB disbanded

The board that was set up in round I to provide input on restoration project planning was disbanded and noticeably absent from the second round. The trustees decided not to use the CRAB for round II due to controversy over the extent of the CRAB's input into restoration project decision-making.

Restoration Planning Round III – A New Approach

The trustees are considering a third round of restoration projects, possibly using a direct grant process. The trustees have about \$5 million for round III restoration funding and hope to build public involvement into the grant process. The trustees are presently examining their legal authority to use this methodology.

The trustees are considering this approach because in the first two rounds, suggestions were submitted by those who were unable to implement the project.

Thus, if the trustees chose such a project, they would then have to find an entity to implement it. Restoration takes considerably longer in this case. With direct grants, the entity submitting the proposal would be responsible for its successful completion. Trustees would not have to find a third-party to carry out the idea and restoration could occur more quickly. However, this approach can preclude the average citizen from having an idea accepted, unless that citizen has the wherewithal to implement the project. Thus, a potential lack of public input could be a serious shortcoming to this approach.

Coordinating Remediation and Restoration

There was debate in New Bedford about using restoration funds prior to cleanup. While trustees set aside a portion of the NRDA settlement, approximately \$6.5 million, to be used when the cleanup is done, they believed that not all restoration activities should wait until after cleanup and instead could be implemented simultaneously.



Martena Marallo

SECTION III LOWER FOX RIVER, WIS. CASE STUDY

Lower Fox River Facts

- Lake Michigan's largest tributary
- Drains approximately 6,330 square miles
- Flows northeast for approximately 39 miles
- Originates at Lake Winnebago and empties into Green Bay
- South end of the bay is a fresh water estuary and the north end is a deep-water lake
- Green Bay watershed encompasses approximately 15,625 square miles in Wisconsin and Michigan
- PCB-contaminated section includes the 39-mile stretch of the Lower Fox River and Green Bay

Paper Companies Release PCBs Causing Widespread Contamination

In the 1950s, seven Wisconsin-based paper companies – Appleton Paper Co., the National Cash Register (NCR) Corp., Georgia-Pacific (formerly Fort James and Fort Howard), P.H. Glatfelter Co., Riverside Paper Corp., U.S. Paper Mills Corp. and Wisconsin Tissue Mills, Inc. – used and released PCBs in the production, conversion or recycling of paper. PCBs were discharged into the Lower Fox River directly from the paper companies and indirectly through waste treatment plants – contaminating the Fox River, Green Bay and Lake Michigan. Commercial fishing has been shut down on Green Bay since 1985.

The direct release of PCBs increased through the 1960s and declined after 1971, when Appleton stopped making PCB-coated paper. However, other paper companies continued to discharge PCBs until the early 1990s. The Wisconsin Department of Natural Resources (WDNR) estimated that between the mid-1950s and 1997, almost 700,000 pounds of PCBs were released into the Lower Fox River. The

WDNR found that, as in the Hudson River, sediments are the most significant source of PCBs in the water.

Hot Spot Dredging

Similar to other sites, PCB characterization and investigation work has gone on for the past 30 years.

Between 1998 and 2000, two dredging demonstration projects resulted in 88,000 cubic yards of sediments containing more than 2,200 pounds of PCBs being removed from three of the most contaminated areas in the Lower Fox River.

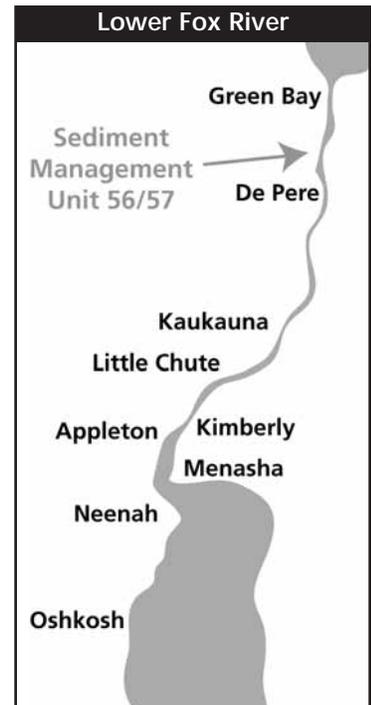
In 2003, the EPA and WDNR issued two separate decisions indicating that \$400 million needed to be spent to remove almost 7.3 million additional cubic yards of sediment from the Lower Fox River. This cleanup, which has been divided into several different units, is currently being designed and is scheduled to occur in phases over the next several years.

NRDA – Feds & State Go Separate Ways

Two separate NRDA's took place on the Lower Fox River. While some settlements have been reached and monies have become available for restoration, this case highlights how a lack of cooperation among government agencies can erode public trust.

In 1989, the U.S. Fish and Wildlife Service (FWS) and other federal and state agencies began considering an NRDA. Despite years of discussions, the WDNR and the paper companies refused to participate. In 1994, FWS and other agencies, known as the co-trustees, proceeded with an NRDA without the state's or the responsible parties' cooperation. The state's refusal to participate in the NRDA process created tension and mistrust in the process.

Despite the state's absence, the co-trustees were viewed as working well together.



Source: WDNR web site

FOX RIVER CO-TRUSTEES

- U.S. Department of the Interior – U.S. Fish and Wildlife Service
- U.S. Department of Commerce - National Oceanic and Atmospheric Administration
- Menominee Indian Tribe of Wisconsin (MITW)
- Oneida Tribe of Indians of Wisconsin (OTIW)
- Michigan Attorney General
- Little Traverse Bay Bands of Odawa Indians in Michigan



In 1997, Wisconsin and the paper companies together launched a separate NRDA, an announcement that came as a surprise to the federal co-trustees.

State and Feds Decide to Cooperate

In an attempt to promote cooperation between federal and state agencies and to facilitate cleanup and restoration, the Intergovernmental Partnership (IGP) was formed in 1997 comprising EPA, the WDNR and the co-trustees.

In 2000, Wisconsin agreed with the co-trustees to merge compatible parts of the competing assessments and subsequently endorsed only parts of the federally led assessment.

Once Wisconsin joined the co-trustees, they were simply referred to as the “trustees.” In 2002, the Michigan Division of Environmental Quality joined the trustees along with the Michigan Attorney General’s Office. While there are two state agencies on the trustee council, they have only one vote for the State of Michigan.

The Co-Trustees’ NRDA Plan

The seven-year, \$10 million NRDA, done by the co-trustees prior to Wisconsin’s involvement, resulted in a *Restoration and Compensation Determination Plan* (RCDP) released in October 2000. The RCDP included

detailed injury reports on birds, fish and surface water and presented the co-trustees’ planned approach for compensating the public for losses and restoring injured natural resources to baseline conditions, including:

- Fish and waterfowl would not be contaminated with PCBs
- Fish and waterfowl consumption advisories would be eliminated
- Bird reproduction and health would not be impaired by PCBs

The RCDP estimated that damages ranged between \$177 million if the cleanup took 20 years and \$333 million if the cleanup took 40 or more years. Five public hearings were held to discuss the RCDP. Hundreds of people attended to show support for being appropriately compensated for damage to the river. The vast majority of testifiers felt the proposed compensation dollars were too low.

The public was given 45 days to review and comment on this 692-page RCDP.

While the full assessment was not carried out, considerable assessment work was done. This was valuable in the settlement negotiation process because it helped bring the paper companies on board. It demonstrated that the trustees were serious and ready to go to court for damages if necessary.

Restoration and Remediation

The RCDP was prepared before the final 2003 cleanup decisions, but the co-trustees indicated that a final NRDA claim could not be determined until after such a decision was made. The EPA and WDNR have subsequently issued cleanup decisions for the Lower Fox River, although some NRDA settlements were initiated prior to these cleanup decisions.

Restoration activities, however, do not need to be delayed until remediation is finished. Restoration can be ongoing as the cleanup proceeds.



Craig Koppie



Rich Schiafo

Natural resources including birds, habitat and the public's ability to fish have all been injured due to PCB contamination of the Lower Fox River, Wis.

Co-Trustees Restoration Planning and Project Ideas

A central element of the co-trustees' restoration approach was to ensure that restoration addresses the full geographic and ecological scope of the injuries to natural resources.

The co-trustees preferred projects aimed at wetland preservation and restoration, reduction of nonpoint source runoff into the bay from cropland, and installation of vegetated buffer strips along streams.

More than 600 potential restoration project ideas were compiled as part of the co-trustee NRDA.

Public Participation: NRDA

Competing NRDA's resulted in separate and varying levels of public outreach and involvement at the Lower Fox River site.

A local environmentalist active at the Lower Fox River site characterized the co-trustees efforts to include the public as "wonderful" and Wisconsin's efforts were described as "terrible."

The co-trustees, led by FWS, indicated that they placed a high priority on public values and attitudes, public access to the assessment, and transparency of the NRDA to ensure that it is credible, understandable, and in the public interest.

In addition to formal public comment periods and formal public meetings, the co-trustees met with various interested parties and stakeholders interested in restoration.

Public surveys were also used to determine preferences and values pertaining to natural resources and restoration.

Settlements Cover Fraction of Damages

The NRDA was valuable in the settlement negotiation process, demonstrating to the paper companies that the trustees were serious and ready to sue. However, damages were estimated up to \$333 million, with settlements to date amounting to \$33 million. Only one of seven companies has reached a final settlement for NRDA liabilities.

With such disparities there is a perception that the public was short-changed. For example, recreational fishing damages alone were estimated to be \$106 million, far more than the \$33 million settlement. Criticized for negotiating such low settlements, the trustees stated that they preferred upfront (albeit lower) settlements to time-consuming and costly litigation.

The Other Restoration Plan

A restoration plan was also prepared with Wisconsin's participation. The goal of the 2003 "Joint Restoration Plan and Environmental Assessment for the Lower Fox and Green Bay," herein referred to as the joint plan is to restore, rehabilitate, replace and/or acquire the equivalent of those natural resources that have been injured. This plan will lay the groundwork

LOWER FOX RIVER NRDA SETTLEMENT TIMELINE

2000

Wisconsin officials announce draft NRDA settlement with Georgia-Pacific for \$7 million. Considerable public upset and dismay over this proposal leads to a state legislative investigation and subsequent withdrawal of the settlement by the state.

2001

Interim settlement reached with Appleton and NCR for a \$40 million “down payment” to be paid over four years – half for cleanup and half for NRDA. Trustees agree not to sue companies in the four-year period, although companies may have additional NRDA liability. Currently funded NRDA projects are from this settlement. NRDA money must be used within four years.

2002

Wisconsin-led NRDA settlement reached with Georgia-Pacific for \$10.86 million, plus a company purchase of 1,063 acres of land.

2003

Interim NRDA settlement was recently reached with Wisconsin Tissue Glatfelter Co. for \$3 million over three years. Does not settle all of potential NRDA liability for this company.



Protecting and restoring wetlands is a high priority for trustees at other hazardous substance sites.

for current and future NRDA settlements

The joint plan was not intended to quantify the full extent of restoration needed because the trustees only had interim NRDA funds available. With future NRDA settlements anticipated, the joint plan is intentionally designed to be very broad, giving a general overview of the potential for restoration. The trustees did not want to have to prepare a plan for each settlement.

The trustees have pledged to provide the public with an opportunity to review any changes to the joint plan prior to modifying it.

Restoration Goals and Projects Under the Joint Plan

The Lower Fox River Trustees, similar to the New Bedford Trustees, gave preference to restoration projects that provide a broad scope of measurable benefits to a wide area or population. Taking a watershed approach, they sought to address the full geographic and ecological scope of natural resource injuries.

Restoration Project Categories

1. Wetland and associated upland habitat preservation, re-establishment or enhancement
2. Fishery resource enhancement
3. Aquatic, near-shore and riparian habitat quality improvement
4. Natural-resource-based public use enhancement

In addition, selected projects should minimize or avoid additional adverse impacts to the resource and the environment.

The group chose projects both within the assessment area as well as outside the area to create alternative sources for replacing ecological services lost or injured by the release of PCBs. Projects closer to the Lower Fox River and Green Bay were preferred over those upstream or in adjacent watersheds.

The first round of restoration includes 17 projects totaling approximately \$11 million.

- Fox River National Wildlife Refuge Native Grassland Restoration to

re-establish native habitat in the Fox River ecosystem used by grassland birds, waterfowl and waterbirds, specifically the sandhill crane

- Duck Creek Watershed Model to begin to compensate the Oneida Tribe for injuries to the reservation fishery and assist the trustees to restore lost wetland habitat in the restoration area. Construction of wetlands within the Duck Creek watershed will allow the Oneida Tribe to return to the traditional, and culturally significant, use of the resources
- Lower Green Bay Purple Loosestrife and Phragmites Control
- Door County Habitat Preservation through acquisition and protection of significant habitats threatened by logging and development. These areas provide habitat for the Hine's emerald dragonfly (federally listed endangered species), shorebirds, bald eagles (federally listed threatened species), waterfowl, and game and commercial fish

(See Appendix A for a complete list of projects)

Public Participation: Restoration Planning

While it is a goal of the trustees to set up a cooperative process between themselves and “partners,” the restoration planning process lacks a public participation component. Other than providing a restoration project proposal form with guidance, the joint plan does not outline how it will develop relationships with partners. Trustees, who only meet once a year, acknowledge that they are still wrestling with how to involve the public in restoration planning and development of restoration project ideas. Trustees are, however, open to talk with any interested group or stakeholders.

“Partners” are municipalities within the restoration area, county and local governments, state and federal government programs, tribal governments, and private

nonprofit organizations interested in fish, wildlife, wetland or aquatic habitat quality enhancing projects.

If the Appleton-NCR money was not used within four years of the 2001 interim settlement, it would have to be returned to the company. Therefore, the trustees decided to move quickly and at their first trustee meeting, in June 2003, internally approved, absent public input, 17 restoration projects.

The trustees suggested that there was implicit support for their restoration plan and chose projects based on the “unprecedented” outreach that was conducted during the co-trustees NRDA. The restoration planning that occurred as part of the co-trustees NRDA was the basis for the joint plan.

This again underscores the importance of early involvement in the NRDA process.

As trustees struggle to involve the public, they acknowledge the challenges associated with coordinating and reaching agreement among different government agencies.

Soliciting Restoration Ideas

In January 2003, the trustees did put out a public request for project proposals. Some 56 restoration project ideas worth \$47 million were submitted. The trustees will be reviewing these projects for implementation with the \$9 million left in the Appleton-NCR settlement.

As the trustees review and process these ideas, some project submittals have already sought and found funding from other sources. The trustees encourage this along with the exploration of matching funds from restoration monies other than NRDA.

- Separate and competing NRDA compromise the public trust and complicate the process.
- The public needs to be informed and engaged.
- Public outreach needs to be extensive and inclusive.
- NRDA estimates of damages can create false expectations that money will be recovered.
- Trustees need to be forthcoming with settlement information.
- NRDA was valuable in the settlement negotiation process and useful in restoration planning and project implementation.
- Negotiated settlements with time constraints and conditions preclude public involvement.



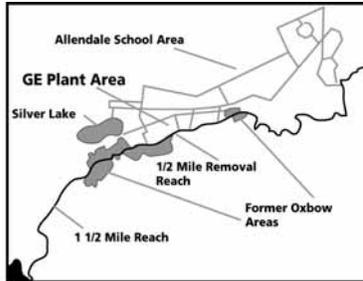
Marlena Marallo

SECTION III – HOUSATONIC RIVER, MASS., CONN. CASE STUDY

Housatonic River Facts

- Originates from four sources near Pittsfield, MA
- Flows southeast for 149 miles through western MA and CT
- Drains into Long Island Sound
- Watershed encompasses 1,948 square miles

The Housatonic River



Housatonic PCB Contamination

From 1932 through 1977, PCBs were used at the General Electric Company's 254-acre plant site in Pittsfield, MA, for the construction and repair of electrical transformers. PCB-contaminated fill was dumped into the river and distributed to Pittsfield area residents, resulting in the contamination of many individual residences including a local school. PCBs were also discharged into the Housatonic River and Silver Lake.

PCB contamination resulted in fish consumption advisories being issued by Connecticut in 1977 and Massachusetts in 1982. High levels of PCBs in wood ducks and mallards led to waterfowl consumption advisories in Massachusetts beginning in 1999.

The Housatonic River was not nominated as a Superfund (CERCLA) hazardous waste site until 1997. The river, however, never became a Superfund site. Cleanup activities, for the most part, have been managed under a different set of rules set up by the Resource Conservation and Recovery Act (RCRA). Trustees have indicated this limited their ability to assess natural resource injuries and bring forth a NRDA claim.

In October 2000, an agreement was reached between federal and state agencies, including the NRDA trustees, the City of Pittsfield, the Pittsfield Economic Development Authority and GE. In addition to compensation for natural resource damages, the agreement addressed the cleanup at the GE plant and Allendale

school, cleanup and restoration of parts of the river and Silver Lake, environmental restoration of the Housatonic River and its floodplains and past and future cost recovery by the government. The cleanup of residential properties is covered under a separate order.

Cleanup Removes Sediment and Riverbank Soils

The river cleanup has been divided into three sections: the first 0.5-mile adjacent to the GE facility; the next 1.5-miles; and the "rest of the river."

Upper 0.5-Mile Reach

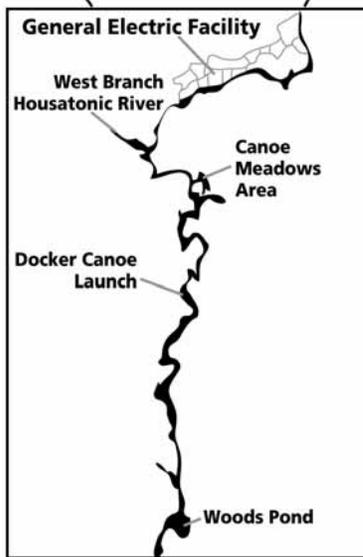
The first half-mile section was divided into two cleanups. From 1997 to 1998, a total of 7,200 cubic yards of highly contaminated sediment and riverbank soil was excavated and removed. The second part, done from 1999 through 2002, removed approximately 18,000 cubic yards of sediments and riverbank soil, with excavation going up to 11 feet in depth.

Next 1.5-Mile Reach

The EPA and U.S. Army Corps of Engineers began work in September 2002, anticipating removal of approximately 95,000 cubic yards of contaminated sediments and riverbank soil over the following four to six years. As part of the agreement, GE will reimburse the EPA for a portion of the costs associated with this part of the cleanup.

Rest of the River

The "rest of the river" cleanup includes the remaining part of the contaminated Housatonic River that runs into Connecticut. The EPA is currently investigating contamination issues in the "rest of the river" including assessing risks to human health and ecological resources. A decision was originally expected in 2002, however it has been delayed and is now anticipated in 2006.



Source: USEPA



USEPA Rachel Fletcher

Fish advisories along the Housatonic River have restricted use of this resource. Public access to a clean river can be an important part of an NRDA claim.

Limited NRDA

In January 1997, a “Preliminary Natural Resource Damage Assessment Report” was prepared for the trustees to assist in the development of a damage claim and settlement position. This report primarily relied on a review of existing data and literature searches. This report attempts to address all aspects of a NRDA, including documenting the release, injury identification and quantification, calculation of economic damages and determination of appropriate restoration activities.

The assessment looked at the river and its floodplain and did not assess potential injuries to Silver Lake, contaminated tributaries, or other non-river related injuries. It was found that some resources such as water, fish, frogs and turtles were injured, but it was not confirmed that contaminated sediment was the source of the injury. Additional injury assessment studies to document injuries were recommended.

Damages associated with lost or diminished recreational fishing and boating were estimated to be between \$11 million and \$32 million. The value of resources for reasons other than lost use ranged from \$25 million to \$250 million.

Recommended restoration activities did not include actual physical restoration of natural resources, but instead sought compensation for interim losses of natural resources and their services.

Because this site never became a federal Superfund site, trustees claim they were unable to properly assess natural resource injuries. They characterize the NRDA as “work on the fly” and not a true assessment.

NRDA Settlement

The \$25 million Housatonic River NRDA settlement is broken down as follows:

- \$7.5 million for the State of Connecticut*
- \$7.5 million for the State of Massachusetts*
- \$ 4 million to go to the Pittsfield Economic Development Authority.**
- \$ 6 million for remediation-related restoration.

* \$7.5 million, placed in an interest-bearing account, has grown to about \$8.5 million

** Money is contingent on the generation of economic activity in Pittsfield

Remediation Related Restoration

- Enhance habitat in upper 0.5-mile stretch
- Payment to improve habitat for next 1.5-mile reach
- Improve habitat and recreation at Silver Lake
- Rerouting brook to its original location, with habitat improvements and nuisance plant removal
- Enhance stormwater drainage and recreation of vegetated buffer by removing pavement

HOUSATONIC RIVER TRUSTEES

- U.S. Department of the Interior – the U.S. Fish and Wildlife Service
- U.S. Department of Commerce – National Oceanic and Atmospheric Administration
- State of Massachusetts, including the Department of Environmental Protection, Office of the Attorney General and Executive Office of Environmental Affairs
- State of Connecticut – Department of Environmental Protection and Attorney General’s Office

A short-term blast of activities and acquisitions will fall short of the goal. A true restoration will also require a sustained comprehensive approach that reaches into classrooms, provides opportunities for people to connect to the river, and forges a new community ethic of river stewardship.

(The Housatonic River Restoration Plan by the People of Berkshire County)

- Create herbaceous native grassland communities at certain GE properties along the Housatonic
- Create floodplain forest/wetland community protected by conservation easements
- Protect wetlands at GE plant site and at a local brook through conservation easements
- Payment for wetlands mitigation – \$600,000
- Assessment of integrity of certain dams

NRDA Settlement Falls Short

The Housatonic NRDA claim was settled as part of the comprehensive agreement between federal, state and local agencies and GE, that addressed both cleanup and restoration liability. The NRDA settlement was made before a full assessment of damages was completed. Community activists characterized the Housatonic NRDA as wholly inadequate, containing huge inaccuracies and providing a low estimate of damages. The NRDA settlement was considered a sacrificial lamb in order to get a better cleanup agreement. The lack of a thorough and comprehensive NRDA bred mistrust for the trustees.

Public Frustrated by Process, Funding Limits

Public participation in the NRDA was characterized as very limited. During the NRDA, representatives of the various agencies changed frequently creating a lack of continuity.

The trustees had occasional meetings, but the meetings frustrated some observers because the trustees continually addressed the NRDA process and not restoration.

By law there is a lengthy process set forth for assessing and proving injury, a burden that lies with the trustees. Limited settlements and constraints on restoration can frustrate those who are thinking more comprehensively about restoration.

In addition, local voices get lost in the negotiation/settlement process because the law provides that those talks be private

between trustees and the responsible parties. This underscores the importance for the trustees to have open, well-advertised public meetings where possible.

The People's Plan

In an effort to have local voices heard, a local environmental group, Housatonic River Initiative (HRI), obtained an EPA grant to prepare a citizen-based restoration plan. Broad-based community outreach from 1998 to 1999 (including almost 70 public meetings and a student conference) captured the thoughts, concerns, and ideas of more than 1,000 Berkshire County residents, led to *"The Housatonic River Restoration Plan,"* a long-term, comprehensive plan and vision for the river.

This effort spawned the Housatonic River Restoration, Inc. (HRR) consisting of representatives of state agencies, local governments, tribal entities, and organizations that are involved in Housatonic River natural resource issues.

This plan does not meet CERCLA regulatory requirements and would not hold up in court. However, this citizen outreach effort was very successful in generating public awareness and interest. It truly reflects the people's loss and their wish to reconnect with the river. The group has been successful in securing approximately \$100,000 in education grants to begin implementing some of the restoration goals identified in its plan.

HRR hopes to create an endowment with the NRDA funds that community organizations instead of trustees could access for ongoing, community-based restoration activities. They hold as their model the Berkshire Environmental Fund (BEF), which funds projects to create a more informed citizenry. They also developed trails and greenways and provided nonpoint source pollution training. Although this may be a sound idea, federal regulation most likely would not allow a local group to manage NRDA funds. NRDA funds are managed by the trustees.

People's Principles of Restoration

- Think in terms of a total watershed plan
- Balance the river's diversity
- Maintain appropriate uses for appropriate places
- Encourage direct contact with the river
- Leverage other funding sources
- Create an endowment
- Emphasize restoration, not development
- Stimulate widespread participation and partnerships

People's Elements of Restoration Planning

- Entity to oversee comprehensive approach
- Water quality control
- Education programs
- Canoe access sites
- Navigable and safe river
- Beaded necklace approach – targeted locations for river walks and river parks to minimize disruption of wildlife
- Ecological restoration
- Land acquisition
- Community-based stewardship programs
- Watershed management plan

HRR Continues Outreach

In October and November 2003, HRR held a series of four more public meetings to continue discussions started in the late 1990s and to continue gathering input on restoring the Housatonic River. Many original restoration ideas identified in the 1999 plan were reaffirmed and expanded in the April 2004 *Plan Update*.

Restoration Planning and Citizen Participation

The trustees have not yet created a restoration plan and, therefore, NRDA monies have not been allocated. The trustees are hiring a restoration coordinator to begin the process of preparing a plan.



Restoration of the Housatonic River bed channel is being conducted as part of the river cleanup.

There was an attempt to allocate NRDA funds for a remediation-related restoration project to create a walkway along the upper reaches where cleanup is occurring. The EPA supported the construction of a walkway while river excavation was being done. The project was too costly, however, and could not be justified in the absence of a restoration plan.

Community Groups Get a Seat at the Table

Due to their early and active participation, both HRR and HRI have been able to secure “ex-officio” positions on the trustee council. While they are non-voting members, the community groups now have a seat at the decision-making table. This will give them the ability to stay more informed and engaged in the discussions. They hope to generate broad public participation in the restoration planning process as well as work to hold trustees accountable.

HRR believes that its plan sets the foundation for restoration and that a considerable amount of planning work has already been done.

The HRR trustee representative urges citizens to attend trustee planning meetings, noting that meetings have been much more open than anyone expected. “If you show up, you can participate. That makes it our responsibility to show up and to shape the NRDA decisions.”

- Inadequate and minimal NRDA appears to have compromised final NRDA settlement.
- Trustees ability to assess injuries and bring a NRDA claim was compromised because the Housatonic River was not a federally listed Superfund site.
- NRDA can be sacrificed to get better cleanup deal.
- Remediation related restoration was part of NRDA settlement, but should be part of remediation settlement.
- Early public involvement helps further restoration by encouraging community participation and by holding trustees accountable to spend limited NRDA funds wisely.
- Community-based outreach provides clear restoration principles that the trustees should incorporate into the planning process.
- People's restoration plan provides a sound basis by which restoration planning can occur along the Housatonic.
- Strong and early public involvement resulted in community groups getting ‘ex-officio’ seats on the trustee council.
- Having a seat at the table can help the community stay informed about the trustees' activities.



Chris Davis Cina

“The restoration plan for the river will not work unless we are an integral part of it — equal partners with the agencies administering the funds in planning and securing the river’s fate. If we are not, we will have bought only a little time instead of an entire future.”

(The Housatonic River Restoration Plan
by the People of Berkshire County)

CASE STUDIES – LESSONS LEARNED FROM OTHER SITES

- NRDA is a long and complex process.
- It is difficult to engage the public in assessment of natural resource injuries.
- Public outreach and participation efforts vary from site to site.
- Public participation and awareness of NRDA is important.
- Trustees must develop and gain the public trust.
- Cooperation amongst and between trustees and responsible parties is important.
- NRDA can help provide knowledge necessary for restoration planning.
- NRDA is useful in settlement negotiations.
- NRDA settlements are encouraged.
- NRDA settlements are significantly less than actual damages.
- Active public participation in restoration planning enhances use of NRDA funds.
- Citizen advisory boards must have a clearly defined role and understand their role.
- “Ex-officio” seats on trustee council can be useful for public involvement.
- NRDA is a potential tool for restoration and compensation.
- NRDA is an opportunity to look at “big picture” restoration.
- It is important to understand the “nexus” or connection of injury to restoration.
- NRDA funds can complement use of other restoration funding.
- NRDA is a component of a larger effort to restore ecological damage to waterways.
- Lack of Superfund status can limit ability to bring NRDA claim.

SECTION IV. FINDINGS

The NRDA Process

The Natural Resources Damage section of the federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) provides a great opportunity for compensation for damages to publicly held natural resources caused by the release of hazardous substances such as PCBs. Natural resources, such as animals, water and land, have the inherent right to protection and restoration from damages caused by dangerous chemicals. Every citizen has a right to use and enjoy these publicly held natural resources and an obligation to assist in their protection, enhancement and restoration.

Burden on Trustees

The burden of proof is placed on trustees to document and quantify the injuries due to the release. The time it can take to prove injury leaves a big gap between when injury begins and when there may actually be monies available for restoration. Both public and environmental health threats, as well as damage to natural resources by hazardous substances, can remain unchecked for years.

Cooperative NRDA

A responsible party has an opportunity to become involved in the NRDA process in the early stages. Known as a “cooperative” assessment, this approach may accelerate accomplishment of restoration goals.

Coordinating Cleanup and Restoration

While the EPA cleanup and trustee restoration efforts are separate, they are intrinsically linked and related. The onus is on the EPA to coordinate cleanup and restoration with the trustees. A partnership between these agencies is critical to the best long-term restoration. Cleanup-related natural resource damages should be addressed as part of the cleanup effort. Failure to properly mitigate and restore natural resources that are damaged during

cleanup should be compensated as part of the NRDA.

Settlements

Instead of long drawn out legal battles, settling an NRDA claim is encouraged. It may be beneficial to the public, to the trustees and to the responsible party to settle NRDA claims so monies can better be spent on restoration instead of litigation. Trustees prefer settlements, believing they can result in fair compensation.

What is fair compensation, however, is a widely disputed subject. It is extraordinarily difficult to place a dollar figure on the damage to natural resources and the lost use of those resources. What is the value of having more mink in a watershed? What is the value of years of lost fishing? Models and formulas, public surveys and other tools are used in an attempt to quantify such damages. Nevertheless, this is far from an exact science.

Based on experience at other contaminated sites, natural resource damages are often sought and settled before a full assessment is complete. This may occur



Those that are not trustees need to be equal partners with public trustees in the effort to use NRDA claims to restore the regions ecosystem. Likewise government needs to appreciate the expertise offered by environmental groups and show a willingness to accept them as allies.

Natural Resource Damages and the Public Trust:
A Position Paper
by the NY/NJ Baykeeper

during the discussion and settlement of a responsible party's liability for hazardous waste cleanup.

While most NRDA cases are settled, there is concern that they are not adequately compensating the public for damages caused by hazardous substances. Assessments can result in estimates of damages that appear to be considerably more than settlements agreed to by trustees. The three case studies included in this guide all reflect NRDA settlements that were for significantly less than the estimated damages.

Low settlement figures may be due to:

- Difficulty in documenting injury
- Concurrent negotiations and settlement for cleanup liabilities
- NRDA settlement compromised in order to attain best possible cleanup agreements

Citizen Input Important on NRDA

The assessment of natural resource damage due to the release of a hazardous substance can be a lengthy, time-consuming and somewhat scientific process that is not particularly engaging to the public.

Nevertheless, experience at other sites has shown that an informed citizenry active in the NRDA can help trustees develop their assessment of damages and can ultimately assist in the restoration of damaged natural resources. Participation in the NRDA can provide citizen advocates a better understanding of damages and thus put them in a better position to advocate for specific restoration initiatives. Citizens, county and local elected officials, and anyone else concerned about protecting and restoring natural resources will want to participate in the NRDA process. Trustees can build trust and support for restoration by involving the public in the NRDA process. In addition, the incorporation of the public's ideas, issues and concerns can result in more comprehensive NRDA and restoration planning.

The single largest barrier to effective public participation may be the lengthy process set forth for assessing and proving injury. In addition, the law sets limits on how NRDA funds can be used. The limited scope of NRDA may frustrate those who are thinking more comprehensively about restoration. While restoration planning needs to be holistic, what can be achieved with NRDA may be more limited in scope because trustees have to show the connection between the restoration and the injury caused by the hazardous substance.

Nevertheless, the ultimate objective of an NRDA is restoration of natural resources to address both lost human uses as well as injuries to natural resources. NRDA restoration planning is an integral part of a larger restoration effort to preserve, protect and restore natural systems that balance a myriad of competing demands that are placed upon natural resources.

Encouraging Public Involvement

Trustees are recognizing the need to go beyond regulatory requirements to enhance citizen involvement and gain public support. Trustee efforts to encourage public participation vary from site to site.

While relying heavily on public meetings is insufficient to inform and activate the public, such forums will continue to be necessary. Community groups involved at other sites indicate a need for more frequent NRDA meetings that are better advertised and more conveniently scheduled and located.

Uncertainty of the Process Can Discourage Public Involvement

The NRDA process does not have a fixed timetable or schedule creating additional impediments to public participation. However, the lengthy NRDA process can afford patient and persistent members of the public ample opportunity for input. While there are fixed points for an individual or groups to formally submit



Michael Nelson



Michael Nelson

Coordination, cooperation and participation will be necessary to restore damages to the Hudson River that were caused by the release of PCBs.

comments on NRDA documents, there are other continuous opportunities to help shape a NRDA.

Public Participation – Advisory Committees

In the three case studies, various approaches were used to garner support and provide opportunities for the public to participate in the NRDA process.

At the New Bedford Harbor site, a citizen advisory committee was created to help promote public participation. After one round of restoration planning, however, this advisory group disbanded because of a lack of clarity in its role as an advisory body. Citizens desired additional and more consistent input into the restoration project selection process.

The experience at New Bedford should not preclude the consideration of such committees at other sites. Trustees must continue to explore ways to empower stakeholders who are willing and interested in participating in this process. The public, as well, must help define their role in the NRDA process.

The desire for more local input and control of restoration planning was also seen at the Housatonic River site as citizens expressed a desire to create a community-based and controlled endowment to administer NRDA monies. In lieu of a citizen advisory board, allowing non-governmental representatives and other community members to sit on the trustee

council as “ex-officio” members may prove to be a constructive way to allow for community participation.

Clearly there is a strong desire at all of these sites for more public input into this process, particularly more say in how NRDA settlement funds are being spent. It behooves the trustees to work closely with various stakeholders to create community-based restoration in which the public truly feels included.

Restoration Project Ideas

The best way citizens can participate in the NRDA process is through the generation of restoration project ideas. Experience at other sites has shown the importance of early involvement.



Marlena Marallo



Marlena Marallo

Interested parties should not wait until after a settlement to get involved. As we saw on the Lower Fox River, NRDA settlements can spell out specific restoration projects, underscoring the importance of early participation.

Nexus

Gathering and selecting restoration projects can be challenging for trustees. Although restoration projects must be linked to the natural resource injury, that connection is not clearly defined and appears to vary from site to site. Some project links to injury are more obvious than others. However, some of the less clear connections pertain to recreation and education, as well as to projects aimed at addressing injuries from environmental standards being exceeded. Protection, enhancement and rehabilitation of prime habitats, such as wetlands, that address injuries to specific species are the most consistent themes that run through restoration projects at other sites. Land conservation techniques are often employed to meet these goals.

Administering NRDA Funds

Using NRDA monies to fund restoration projects in the most cost-effective way is challenging. While public solicitation of project ideas is encouraged, the individual usually does not have the capacity to actually implement the project. Therefore, the trustees must find someone to execute the proposed project by putting it out for public bid, which takes time and money and delays restoration. A direct form of funding projects may be preferred to make NRDA monies more readily available for actual restoration.

For this reason, the New Bedford Trustees are considering using a grant application approach for their third round of restoration planning. This, however, may preclude public input.

Ecosystem-wide Scope of NRDA

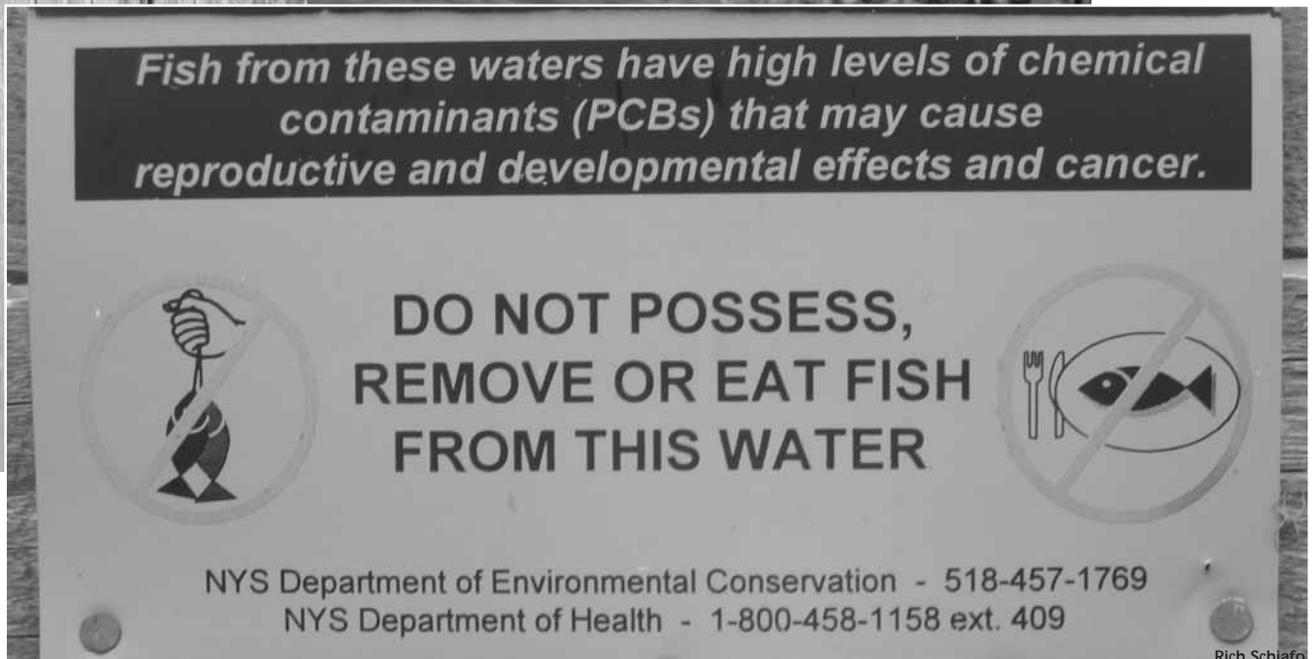
Restoration goals that are holistic address the overall health of the ecosystem while restoring specific natural resources. A holistic or watershed approach to restoration was the goal at each site examined.

Determining the damage, and hence the value of an entire ecosystem, is not easy. However, a broad approach to restoration must truly take into account what the ecosystem would have looked like if it were not for the release of a hazardous substance such as PCBs. Assessment and restoration must address the dynamics within an ecosystem prior to the release of the hazardous substance and what it will take to restore the system. The ecosystem as a whole must be restored to conditions that existed prior to the release.

It is critically important that natural resources be appropriately protected and restored to maintain ecological health. Restoration projects, while perhaps locally based, should have broad-based positive impacts on the overall health of the ecosystem.



Rich Schiafo



Rich Schiafo

Section V. NATURAL RESOURCE DAMAGE AND RESTORATION-RELATED RESOURCES

NRDA CONTACTS

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Natural Resource Damage Unit
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Phone: 518-402-8996
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www.dec.state.ny.us/web site/dfwmr/habitat/nrd/index.htm

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www.dec.state.ny.us/web site/dfwmr/habitat/nrd/index.htm
To submit restoration projects ideas, contact Larry Gumaer, NYS-DEC or visit: www.dec.state.ny.us/web site/dfwmr/habitat/nrd/rest-fm.pdf

Thomas Brosnan

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www.darp.noaa.gov
<http://www.darp.noaa.gov/northeast/udson/index.html>

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kathryn_jahn@fws.gov
<http://contaminants.fws.gov/restorationplans/HudsonRiver>

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Hadley, MA 01035
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Robert_foley@fws.gov

Keeping up-to-date via the Hudson-NRDA Listserv

To access the trustee listserv and receive email updates every three to five months, send a message to: requests@williamette.nos.gov. Write "Subscribe hudsonnrda" in the subject line to receive a confirmation email to which you must reply within 24 hours.

NATURAL RESOURCE DAMAGE WEB SITES

Hudson River

New York State Department of Environmental Conservation
www.dec.state.ny.us/web site/dfwmr/habitat/nrd/index.htm
National Oceanic and Atmospheric Administration:
<http://www.darp.noaa.gov/northeast/udson/index.html>
United States Fish & Wildlife Service:
<http://contaminants.fws.gov/restorationplans/HudsonRiver.cfm>

Hudson River Mink Injury Study:

www.dec.state.ny.us/web site/dfwmr/habitat/nrd/HRMammalStudy.PDF

Hudson River Bird Injury Study:

www.dec.state.ny.us/web site/dfwmr/habitat/nrd/Birdfactsheet.pdf

Fish Consumption Advisories Injury Study:

www.dec.state.ny.us/web site/udson/pcb/fishinjury.pdf

Snapping Turtle Injury Study:

www.dec.state.ny.us/web site/dfwmr/habitat/nrd/Snappingturtles.pdf

Water Quality Injury:

www.dec.state.ny.us/web site/dfwmr/habitat/nrd/bopp.pdf

Injury to Sediments:

www.dec.state.ny.us/web site/dfwmr/habitat/nrd/FinalFloodReport.pdf

New Bedford

www.darp.noaa.gov/neregon/newbed.htm

Lower Fox River

<http://www.dnr.state.wi.us/org/water/wm/lowerfox/nrda.html>
<http://midwest.fws.gov/nrda/index.html>
<http://midwest.fws.gov/NEPA/FoxRiver/index.html>
www.foxriverwatch.com

Housatonic River

<http://www.epa.gov/region01/ge/restoration.html>
www.restorehousatonic.com
www.housatonic-river.com

Other NRDA Web sites

NY/NJ Baykeeper
www.nynjbaykeeper.org

NOAA Cooperative Assessment Project (CAP)

<http://www.darp.noaa.gov/cap.htm>

Remediation Web Sites

Hudson River

www.epa.gov/hudson
www.darp.noaa.gov/neregion/hudsonr.htm
www.scenichudson.org
www.clearwater.org

New Bedford

www.epa.gov/ne/nbh

Lower Fox River

www.dnr.state.wi.us/org/water/wm/lowerfox/proposedplan.html

Housatonic River

www.epa.gov/region01/ge/index.html

NONGOVERNMENTAL ORGANIZATIONS

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Fax: 518-439-6036
jgardnerjr@nycap.rr.com

Arbor Hill Environmental Justice Corporation,

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Phone: 518-463-9760
Fax: 518-463-0544
Rodney Davis
rdavis@w-haywoodburns.org

Coast Alliance

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Andy Mele, x121, andy@clearwater.org

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Fax: 518-432-6178
Laura Haight, lhaight@nypirg.org

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Riverkeeper, Inc.

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Alex Matthiessen, amathiessen@riverkeeper.org

Scenic Hudson, Inc.

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Fax: 845-473-2648
Rich Schiafo, x274, rschiafo@scenichudson.org
Alix Gerosa, x226, agerosa@scenichudson.org

Sierra Club

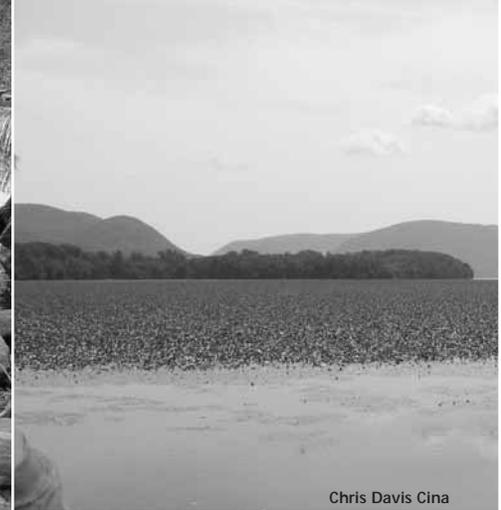
85 Washington St.
Saratoga Springs, NY 12866
Phone: 518-587-9166
Fax: 518-583-9062
Chris Ballantyne, chris.ballantyne@sierraclub.org



Stohner



Dan Miller



Chris Davis Cina

Monitoring of sewage loadings, dam removal and control of invasive plants species such as water chestnut are among the suggested restoration proposals being submitted to the Hudson River Trustees.

ECOLOGICAL RESTORATION WEB SITES

New York State Department of Environmental Conservation
[www.dec.state.ny.us/web site/dfwmr/habitat/hoa1b2j.htm](http://www.dec.state.ny.us/web%20site/dfwmr/habitat/hoa1b2j.htm)

National Estuarine Research Reserve – Hudson River Reserve
<http://nerrs.noaa.gov/HudsonRiver/>

National Estuarine Research Reserve -Habitat Restoration Science
<http://nerrs.noaa.gov/Restoration/welcome.html>

National Estuarine Research Reserve Association
www.nerra.org/

NOAA Restoration Center
www.nmfs.noaa.gov/habitat/restoration/

NOAA Office of Response and Restoration
<http://response.restoration.noaa.gov/>

NOAA Restoration Portal
<http://restoration.noaa.gov/>

NOAA Community-based Restoration Program
www.nmfs.noaa.gov/habitat/restoration/projects%5fprograms/crp/index.html

NOAA's Regional Restoration Efforts – Taking an Ecosystem Approach
www.nmfs.noaa.gov/habitat/restoration/projects_programs/regional/index.html

NOAA Restoration Funding Opportunities
www.nmfs.noaa.gov/habitat/restoration/funding_opportunities/funding.html

The Office of Ocean and Coastal Resource Management
<http://coastalmanagement.noaa.gov/pcd/habitat.html>

The Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)
www.ciceet.unh.edu/

NOAA Restoration – Collaborating with Communities
<http://restoration.noaa.gov/htmls/communities.html>

Restore America's Estuaries
www.estuaries.org

Restore America's Estuaries – Resources
www.estuaries.org/resources.php

Estuary Habitat Restoration Opportunities
Restore America's Estuaries – Resources
www.estuaries.org/policyandfunding.php

Funding for Habitat Restoration Projects: A Citizen's Guide
Restore America's Estuaries – Resources
www.estuaries.org/policyandfunding.php

The Society for Ecological Restoration
www.ser.org/

The Arboretum University of Wisconsin – Madison – Ecological Restoration
<http://ecologicalrestoration.info/>

Environmental Protection Agency
www.epa.gov/owow/nps/Ecology/

Trees for Life
www.treesforlife.org.uk/tfl.eco.html

NYS Department of State, Coastal Resources, Assistance to Local Governments, Local Waterfront Revitalization Programs
www.dos.state.ny.us/cstl/lwrrp.html

Books on Ecological Restoration

ASSEMBLY RULES AND RESTORATION ECOLOGY

Bridging the Gap Between Theory and Practice
Edited by Vicky M. Temperton, Richard J. Hobbs,
Tim Nuttle and Stefan Halle
Island Press, 2004

ENVIRONMENTAL RESTORATION

Science and Strategies for Restoring the Earth
Edited by John Berger
Island Press, 1990

HISTORICAL ECOLOGY HANDBOOK

A Restorationist's Guide to Reference Ecosystems
Edited by Dave Egan, Evelyn Howell
Island Press, 2001

SAVING NATURE'S LEGACY

Protecting and Restoring Biodiversity
Defenders of Wildlife
Island Press, 1994

WETLAND CREATION AND RESTORATION

The Status of the Science
Edited by Jon A. Kusler, Mary E. Kentula
Island Press, 1990

WILDLIFE RESTORATION

Techniques for Habitat Analysis and Animal Monitoring
By Michael L. Morrison
Island Press, 2002

Restoring Streams in Cities: A Guide for Planners, Policymakers,
and Citizens

By Ann L. Riley
Island Press, 1998

Ecological Riverfront Design

By Betty Otto and Michael Leccesse
American Planning Association, March 2004
http://www.amrivers.org/doc_repository/riverfront/ScreenPDFs/cover.pdf

Giving New Life To Streams: Tales from Two Towns

Rivers and Trails Program
National Park Service
909 First Avenue
Seattle, WA 98104
206-220-4113
www.nps.gov/rtca

Daylighting: New Life for Buried Streams

By Richard Pinkham, Rocky Mountain Institute, 2000
www.rmi.org
970-927-3851

Daylighting/Restoring Streams in Rural Community City Centers:
Case Studies

By Paul Hoobyar
National Park Service
Rivers and Trails Conservation Assistance Program, 2002

Best Management Practices for Water Quality

New York State Forestry
BMP Filed Guide, January 2000
Watershed Agricultural Council Forestry Program
607-865-7790

Protecting The Source

By Caryn Ernst
Land Conservation and the Future of America's Drinking Water
Trust for Public Land and American Water Works Association
<http://www.tpl.org/>

Reversing the Tide:

Restoring our Nation's Coastal Environment
Damage Assessment and Restoration Program
National Oceanic and Atmospheric Administration – 2003
www.darp.noaa.gov

NEW BEDFORD HARBOR RESTORATION PROJECTS: ROUND I

Round I was initiated in October 1995 through a notice in the *Federal Register*. A record of decision was signed in September 1998. Eleven restoration ideas were selected for implementation.

1. Buzzards Bay Tern Restoration –

Monitor common and endangered roseate tern colonies at Bird Island and Ram Island; reclaim a nesting site at Penikese Island, rebuild nesting habitats at Bird (and possibly Ram) Island, and analyze tern eggs for PCB contamination.

Status: Funded 2/99 for two years.

Completed. Reports available and posted on web site

Funding: \$266,400

2. Eelgrass Habitat Restoration – Survey eelgrass within the harbor, identify eelgrass habitat, select priority areas for restoration, and plant eelgrass in these areas to provide fish and shellfish habitat.

Status: Funded 2/98 and 5/99, **Completed.**

Several eelgrass beds were planted. To date four beds are growing and propagating.

Funding: \$454,117 in two disbursements: \$125,244 and \$328,873

3. Fort Taber Park – Assist in the construction of a recreational park at Fort Rodman by providing beach and shoreside access, building restroom facilities and a community center, and by reconstructing a pier.

Status: Funded 11/99 by a grant to the City of New Bedford through the Commonwealth. The bath house, community center and restroom facilities are completed.

Funding: \$2,208,003

4. Herring Run Restoration – Repair fish ladders at the Acushnet Sawmill, Hamlin Street Bridge, and the dam at the outlet of Old New Bedford Reservoir and transplant river herring into a mid-water pond.

Status: Funded 11/98 with disbursement to the Commonwealth. Division of Marine Fisheries is coordinating the project. The reservoir dam fishway was completed in 10/02. The preferred approach is to have a partial breach of the two dams with a ramp structure to allow for fish passage but also to maintain the water levels of the impoundments.

Funding: \$599,920

5. Hurricane Barrier Box Culvert – Install an additional opening in the hurricane barrier at the mouth of the Acushnet River to increase tidal exchange between the Harbor and Buzzards Bay.

Status: A citizen initially suggested this project. The hurricane barrier is an ACOE structure and it must agree to any modifications. A recent request was made to the ACOE to conduct a feasibility study. If accepted and approved, staff will work with the ACOE to develop a detailed scope and budget for the study.

Funding: \$0 to date, \$2.5 million in reserve

6. New Bedford/Fairhaven Harbor Master Plan – Assist in the development of harbor open space planning and use through the comprehensive New Bedford/Fairhaven Harbor Master Plan.

Status: Funded 11/99, **Completed.**

Report issued.

Funding: \$50,000

7. Padanaram Salt Marsh Restoration –

Replace an old, damaged, undersized culvert with a new, properly sized arch culvert to improve tidal flushing in the marsh.

Status: Funded 6/00. **Completed May 2003.**

Funding: \$ 46,967.62 (\$22,122.40 + \$24,845.22)

8. Riverside Park Belleville Avenue Recreational Marine Park – Create a coastal park along a saltwater cove with picnic benches, walking/biking paths, a possible pier or boat ramp, and marsh restoration or other enhancement of coastal habitat. Initial action would determine the potential of the site for a park and whether contaminants are present.

Status: Assessments have been completed and a design plan and budget for the park which was submitted to the Trustee Council. At the trustees' request, the city is pursuing a conservation restriction for the site.

Funding: \$38,713 (Phase I – \$17,553 and Phase II – \$21,160), \$2 million in reserve

9. Restoration and Management of the New Bedford Area Shellfishery – Restore the shellfish resource and the shellfishery in the Outer Harbor by purchasing and planting adult and seed quahogs, releasing contaminated adult quahogs to clean areas for depuration, and purchasing and spreading bay scallop and soft shell clam seed.

Status: Funded 5/99 and 2/01, Grant issued for **first year – completed and closed.** Preliminary results indicate that seed

planted in 2000 and 2001 had mixed success with survival ranging from 0% to 75%. Based on this information, the monitoring study has been redesigned as well as the seeding methodology to be used in Fall 2003.

Funding: \$1,238,737 (\$289,684 and \$289,684 and \$659,369)

10. Sciticut Neck Land Purchase – Purchase 160 acres on Sciticut Neck, Fairhaven, which is the largest undeveloped, uncontaminated parcel of coastal property within the New Bedford Harbor environment.

Status: Funded 11/98, **Completed.**

Funding: \$393,652.50 (purchase: \$380,000 and pre-acquisition studies: \$13,652.50)

11. Wetlands Inventory – Study wetlands within the New Bedford Harbor environment to identify and plan for future wetlands restoration.

Status: Funded 6/99. Funds were provided to the Massachusetts Wetlands Restoration Program (WRP), which produced the New Bedford Harbor Environment Wetlands Restoration Plan. **Completed 6/03.** Balance of funds from this project were used to develop a concept plan for the Marsh Island salt marsh restoration.

Funding: \$55,305

NEW BEDFORD HARBOR RESTORATION PROJECTS: ROUND II

Round II was initiated in August 1999 through a notice in the *Federal Register*. A record of decision was signed in January 2001. Seventeen restoration ideas were selected for implementation.

1. Acushnet River Valley Land Conservation Project – The purchase of either a fee interest in, or conservation restriction, for three parcels totaling approximately 208 acres of land along the Acushnet River.

Status: Closing on two parcels occurred on December 27, 2001. Disbursement of funds for the third parcel occurred 12/02.

Funding: \$968,148 (Proposed: \$964,000)

2. Aquarium Exhibit on PCB Impacts to Natural Resources – An exhibit to 1) explain PCBs and examine the effects of PCB contamination on natural resources, and 2) educate visitors to change their everyday behavior to have a positive impact on the harbor and its natural resources.

Status: Funding for this project is dependent on funding for the Oceanarium project.

Funding: \$0 (\$150,000 in reserve)

3. Aquarium Salt Marsh Creation –

A salt marsh would be constructed on the Aquarium site to be colonized with both low and high marsh plant species and animals.

Status: Contamination on the proposed site would make it too costly to construct a salt marsh on site. Consideration of other sites within the harbor was requested, but the Trustee Council responded that this would be a new proposal that should be submitted under the next funding round.

4. Artificial Reef – An artificial reef (or reefs) would be constructed within Upper Buzzards Bay.

Status: A contract was issued (after competitive solicitation) for a feasibility study focused on location, design and benefits to the injured natural resources. The draft study has been received and reviewed by the technical advisors. The next step is for a public meeting to receive comments on the results.

Funding: \$52,538.40 (Proposed: \$500,000; \$75,000 requested for feasibility study)

5. Buzzards Baykeeper – Monitoring to determine whether trustee-funded projects are being properly implemented and identify any potentially adverse affects to successful implementation. Original idea was to provide funds to the Buzzards Baykeeper in the amount of \$30,000 a year for five years.

Status: It has been determined that a competitive procurement is appropriate for this activity since the project could be conducted by a number of groups. The technical advisors have concerns about the benefits to other trustee-funded restoration projects. A revised scope has been prepared and sent to the trustees and their legal advisors for their review.

Funding: \$0 (Proposed: \$150,000)

6. Community Rowing Boathouse – A study to evaluate the full range of potential lost recreational uses of the harbor environment associated with PCB related injuries to natural resources. Funding for a boathouse and additional rowing whaleboats was dependent upon the study showing a sufficient loss of recreational boating to justify the cost of the project.

Status: It was determined that the com-

prehensive study needed to justify the project would be too expensive in relation to the actual boathouse project itself. A resolution disapproving project funding was signed in 4/02.

7. Marsh Island Restoration –

Restoration of the salt marsh at Marsh Island, Fairhaven.

Status: The Fairhaven/Acushnet Land Preservation Trust (FALPT) offered to pursue securing a conservation restriction or purchase of the property. The Trustee Council agreed with this approach and the FALPT purchased the property in December 2002. Once a conservation restriction has been secured for the property, the Trustee Council will reimburse the land trust for the purchase price. A restoration concept plan has been developed.

Funding: \$50,000 (Proposed: \$750,000)

8. Marine Fish Stock Enhancement –

A feasibility study to determine whether a facility to raise species injured by PCB contamination for replacement of species, or to provide a clean food source for the food chain, can meet the trustees' goals. If justified by the study then funding would be provided for design and construction of the facility.

Status: A revised scope and justification are being prepared.

Funding: \$0 (Proposed: \$1,950,000)

9. Nonquit Salt Marsh Restoration –

Installation of a new 100-foot culvert and removal of a tidal slide gate to improve tidal flushing of the 60-acre Nonquit Marsh, Dartmouth.

Status: Funded 8/01. A draft feasibility study was prepared and presented. The Trustees approved a resolution to provide funds for additional work. The goal will be to reach consensus on the preferred restoration alternative.

Funding: \$149,272

10. Popes Beach Land Purchase (North) –

The purchase and establishment of a conservation restriction on approximately 2.6 acres on Sconticut Neck, Fairhaven. This involves five separate properties.

Status: Pre-acquisition studies have been completed. Funding was provided to the Fairhaven Conservation Commission for the purchase of several pieces of property.

Funding: \$860,000 (Proposed: \$55,000)

11. Popes Beach Land Purchase (South) – The purchase and establishment of a conservation restriction on approximately 3.5 acres on Sconticut Neck, Fairhaven.

Status: Pre-acquisition activities have been completed. Funding was provided to the Fairhaven Conservation Commission in April 2003, for the purchase of this property.

Funding: \$757,000 (Proposed: \$145,000)

12. Regional Shellfish Grow Out System – Shellfish would be restored through the construction and startup of a shellfish grow out up-well system or through funding of an existing facility to provide shellfish seed for transplant.

Status: Since there was more than one idea for such a project, a contract solicitation has been prepared. This request for proposals has been submitted to the Trustee Council for approval. Funding will then be sought through a disbursement from the court.

Funding: \$0 (Proposed: \$500,000)

Phase 2 of Tern Restoration

Restoration and Management of Tern Populations – Management and monitoring of endangered roseate and common tern colonies at Bird Island and Ram Island; establishment of nesting areas at Penikese Island; and stabilization of Bird Island.

Status: Funded 8/01. A study on the stabilization has been completed that calls for filling a portion of Bird Island to create more nesting habitat and rebuilding the revetment around the island to stabilize the work. The design of the two salt marsh restoration mitigation sites for the filling of the Bird Island salt marsh has been finalized and will be submitted to the ACOE for review and approval shortly.

Funding: \$445,525 for years 2002 and 2003 (\$331,000 for years 2004 and 2005, and \$159,075 for the year 2006); (\$541,455 for design and construction – pending)

13. Riverside Auto Wrecking Land

Acquisition – The purchase and establishment of a conservation restriction on four lots in Acushnet totaling approximately 14.3 acres.

Status: The site assessment recommends further sampling on the property due to staining and previous use. The land trust has applied for, and received, 501(c)3 status allowing the Trustee Council to proceed. A conservation restriction has been drafted and is under review.

Funding: \$0 (Proposed: \$675,000)

14. Upper Harbor Confined Disposal Facility Enhancements – A study of the types of plantings to benefit birds and other wildlife that could be supported by the confined disposal facility proposed north of Coggeshall Street, New Bedford. **Status:** EPA will inform us if there is a likelihood that they will proceed with this project.

Funding: \$0 (Proposed: \$25,000 for study)

15. Upper Sconticut Neck Shellfish/Sewer Installation – A study to determine the sources of contamination impacting closed shellfish beds in Outer New Bedford Harbor. Results of the study could provide justification for the trustees to release additional funds to assist in design and engineering to correct the problem.

Status: Preliminary results have been received which indicate that the source of the contamination is likely waterfowl.

Funding: \$129,694 (\$570,306 in reserve)

16. Winsegansett Field Station – Habitat restoration and environmental education projects targeting specific human activities on Sconticut Neck, Fairhaven.

Status: Among the possibilities found was an inadequate culvert creating a tidal restriction and a potential restriction under Sconticut Neck Road as well. A consultant was hired to map out the vegetation and conduct a restoration feasibility study.

Funding: \$103,475 (Proposed: \$360,000)

17. Reliable Truss Marsh

Enhancement/Park – Upper estuary wetland restoration – the trustees, in cooperation with the EPA and ACOE enhance marsh. The City of New Bedford is also planning on constructing a recreational park on the site.

Status: Lead contamination has been found at various locations, which resulted in the cost of the project escalating. The Trustee Council chose to not pursue this project due to these higher costs.

Funding: \$25,794

Source: www.darp.noaa.gov/northeast/new_bedford/index.html

LOWER FOX RIVER RESTORATION PROJECTS

1. Fox River National Wildlife Refuge Native Grassland Restoration

Description: The Fox River National Wildlife Refuge (NWR) was established to protect nesting and loafing habitat for the sandhill crane. Waterfowl and other migrant birds also use the area for nesting, feeding and as a rest area during migration. The requested funds will be used to remove the artificially established red pine plantation and re-establish native grassland, making the habitat more conducive to what was historically found in the area.

Benefits: This project will re-establish native habitat in the Fox River ecosystem used by grassland birds, waterfowl, and waterbirds, specifically the sandhill crane. The use of the waterfowl as a resource was injured from PCBs due to waterfowl consumption advisories. The upper Fox River system has not been harmed from the release of PCBs, and birds reared from this habitat will assist in replacing those that cannot be used. This project will also provide benefits for other migratory birds and establish native vegetation for substantial erosion control for the soil.

Restoration Goal(s): Wetland and associated upland habitat re-establishment

2. Wolf River/Green Bay Habitat Preservation

Description: Wisconsin has numerous project boundaries established for the purpose of protecting, preserving and enhancing the unique and threatened habitat of fisheries and wildlife resources within the restoration area of the Lower Fox River/Green Bay project area.

Benefits: Bottomland hardwood forests are unique for their yearly flood absorption and recycling of nutrients. They offer opportunities for waterfowl for breeding as well as migrant corridors. The area would protect remaining remnants of marsh habitat for walleye rearing and spawning and may offer some opportunity for restoration of spawning sites for sturgeon. The west shore provides spawning and rearing habitat for almost all fish in Green Bay that need wetlands. These wetlands also provide flow regulation and nutrient absorption that benefits the Green Bay fishery and aquatic ecosystem.

Restoration Goal(s): Wetland and associated upland habitat preservation,

aquatic and near-shore habitat quality improvement

3. Design of the 40-Acre Lake Within the Exterior Boundaries of the Oneida Reservation

Description: The final goal of this project is to replace the injured fishery and gathering resources lost because of the release of PCBs into the Fox River ecosystem. Time estimates indicate that it will take 40+ years for the contamination level of PCBs in fish in the Fox River/Green Bay fishery to drop below the FDA recommended maximum level for unlimited consumption. Creation of the lake will allow the Oneida Tribe to resume their traditional diet without fear of PCB injuries. A major objective of the lake design is to create a sustainable fishery for tribal members with minimal impact from non-tribal influences. **Benefits:** This project will begin to compensate the Oneida Tribe for injuries to the reservation fishery. The lake may also have additional cultural significance if construction allows for wild rice beds, inclusion of ceremonial gathering sites and educational opportunities for the Oneida Tribe.

4. Duck Creek Watershed Model

Description: The final goal of this project is to develop a strategy for restoring wetlands within the Duck Creek watershed. A wetland model has been developed for the entire watershed to prioritize the five sub-watersheds, that comprise the Duck Creek watershed, for restoration work. A major objective of the Duck Creek wetlands restoration is to create a sustainable fishery for tribal members.

Benefits: This project will begin to compensate the Oneida Tribe for injuries to the reservation fishery and assist the trustees to restore lost wetland habitat in the restoration area. Restoring the sustainable fishery will be partial compensation for the Oneida Tribe. Because it takes restored wetlands decades to mature, replacing Duck Creek wetlands now will provide suitable spawning and waterfowl habitat for a restored Fox River and Green Bay ecosystem.

Restoration Goal(s): Fishery resource enhancement, wetland and associated upland habitat preservation, re-establishment or enhancement

5. Wild Rice Reintroduction

Suitability Study

Description: The study objectives will assess reseeding efforts and general decline of wild rice wetlands to construct monitoring and management criteria. The study will focus on possible impacts from man-induced activities as well as natural occurring impacts. Past studies have found that heavy metals and acidic conditions have attributed to loss of wild rice; additionally there has been loss attributed to phosphorous and sediment nitrogen levels. The project goal is to determine suitable habitat that can support initiation of wild rice reintroduction efforts to benefit the Menominee Tribe and its surrounding ecosystem.

Benefits: Wild rice production on the reservation, waterfowl production to the area and benefits to other wildlife associated with the habitat (i.e., otter, beaver, mink, song birds, eagles and hawks).

Restoration Goal(s): Aquatic and near-shore habitat quality improvement

6. Cat Island Chain Restoration Project – Modeling and Design Work for Project Construction

Description: The requested funding would allow the modeling and design work to proceed and would represent part of the local sponsor's non-federal funding contribution to the project. The project will be constructed through the U.S. Army Corps of Engineers Detroit District (Corps). The islands are being restored to serve their historic function as a barrier island chain that protected an extensive coastal wetland complex of emergent and submergent vegetation in the southwest area of the lower bay including wetlands at the mouth of Duck Creek. The islands provided habitat as well, particularly for colonial nesting waterbirds and shorebirds.

Benefits: The Cat Island Chain restoration project will help to replace coastal wetland and island habitat that has been lost from the lower Green Bay ecosystem. Migratory birds including waterfowl; common tern, Forster's tern, black-crowned night heron and other colonial nesting birds; shorebirds; passerine species and raptors are expected to benefit from the project as well as various fish species that are expected to have improved spawning and nursery habitat and the other biotic species associated with coastal wetlands of the area. Another

intended benefit of the project is improved waterfowl hunting opportunity in the lower bay.

Restoration Goal(s): Aquatic and near-shore habitat quality improvement, wetland and associated upland habitat preservation, re-establishment or enhancement

7. South Bay Marina – Habitat Enhancement Project

Description: The purpose of this work was to provide habitat protection and improvement of the environmentally degraded urban waterfront in the Lower Fox River and South Bay. Structures will provide valuable spawning habitat for walleyes and other predator species, consistent with the goals of the NRDA restoration priorities of restoring a balanced food web in the bay through enhancement of the top predator species.

Restoration Goal(s): Aquatic and near-shore habitat quality improvement, fishery resource enhancement

8. Assessment of Yellow Perch in Green Bay

Phase I of the Lake Michigan Fisheries Forum Yellow Perch Workshop Recommendations

Description: The Lake Michigan Fisheries Forum arranged a series of three workshops to engage interested public in identifying potential solutions to Green Bay yellow perch issues. Generally the workshop participants desired to conserve the existing Green Bay yellow perch stocks through better management and understanding of predatory and habitat influences. Both forum members and other workshop participants expressed a need to reexamine the way the yellow perch population abundance is assessed.

Benefits: Work accomplished will produce information needed to meet the goal of self-sustaining fish populations in Green Bay.

Restoration Goal(s): Fishery resource enhancement

9. CARA Grant Match – West Shore Habitat Acquisition

Description: The Wisconsin DNR has received a coastal management grant to acquire important northern pike spawning properties in the Green Bay West Shores Wildlife Area. The grant requires a 25% non-federal match that will be satisfied with the settlement funds.

Benefits: The function of many wetlands located on the western shore of Green Bay have already been lost, and habitat loss continues at an accelerating rate. The west shore provides spawning and rearing habitat for almost all fish in Green Bay that need wetlands for spawning and rearing. These wetlands also provide flow regulation and nutrient absorption that benefits the Green Bay fishery and aquatic ecosystem.

Restoration Goal(s): Wetland and associated upland habitat preservation, aquatic and near-shore habitat quality improvement

10. Great Lakes Muskie Reintroduction and Enhancement

Description: Restoring native predators to the Green Bay aquatic environment has been a priority of the Green Bay Remedial Action Plan. This project will enable cooperation in the efforts to restore Great Lakes musky to Green Bay.

Benefits: The strain of muskie native to the Great Lakes will be restored to the waters of Green Bay. The re-establishment of this native predator will have many benefits to the Green Bay fish community, could buffer the negative impact of invading aquatic nuisance fish species, and may provide for a valuable trophy sport fish.

Restoration Goal(s): Fishery resource enhancement

11. Great Lakes (Spotted) Muskie Restoration Management

Description: The Remedial Action Plan for the Lower Fox River/Green Bay Area of Concern establishes a goal of increasing the number and diversity of the fishery through the increase of top level predators in the aquatic food chain. The DNR has a program for the restoration of spotted muskie in the Fox River and Green Bay. Initial success is sufficient for the DNR to focus more funding and effort toward obtaining appropriate brood stock and enhancing the reintroduction efforts for Great Lakes spotted muskie. Production of 15,000 to 20,000 large muskie fingerlings. This is four to seven times the number of muskies that have been stocked historically.

Restoration Goal(s): Fishery resource enhancement

12. Lower Green Bay Purple Loosestrife and Phragmites Control

Description: Wetlands along the west and south shores of lower Green Bay have been degraded by stands of purple loosestrife and phragmites as well as other exotic vegetative species that have become established. These species provide little food or habitat value to wildlife and out compete the beneficial native wetland vegetative species. Through this project, an extensive, concentrated control effort would be undertaken through a partnership effort among the federal, state and local natural resource agencies in the Green Bay area as well as interested organizations and volunteers. Efforts would focus on control of purple loosestrife and phragmites.

Benefits: Controlling the invasive, exotic vegetative species that compete with native wetland vegetation in the lower bay will contribute to improvement of the currently degraded condition of Green Bay's coastal wetlands. Re-established wetlands in the targeted area will improve habitat for waterfowl species nesting and rearing broods in the area as well as during migration. Forster's tern, rails, bittern, egrets, other waterbird and marsh bird species as well as fish species also will benefit from improved wetland habitat.

Restoration Goal(s): Wetland and associated upland habitat preservation, re-establishment or enhancement

13. Perch Management Options Evaluation

Description: The Lake Michigan Forum, an advisory group to the Department of Natural Resources, has recommended that an evaluation of alternative management techniques be conducted in order to plan for appropriate management activities to deal with the reduced population of yellow perch and increasing population of white perch in Green Bay. Monitoring of PCB concentrations in the white perch population will help inform the agencies and the public on perch management issues.

Benefits: The information gained in these sessions and through this monitoring will provide the basis for better fisheries management decisions relating to the use of future NRDA damages for this site, as well as management activities specific to perch.

Restoration Goal(s): Fishery resource enhancement

14. Door County Habitat Preservation

Description: Acquisition and protection of significant habitats in Door County, Wisconsin. These project areas are also designated as Wisconsin State Natural Areas.

Benefits: The lands subject to acquisition will protect headwater streams and wetlands on the bay side as well as the lake side of Door County. These lands are threatened by logging and development. These areas provide habitat for the Hine's emerald dragonfly (federally listed endangered species), shorebirds, bald eagles (federally listed threatened species), waterfowl, and game and commercial fish.

Restoration Goal(s): Wetland and associated upland habitat preservation, aquatic and near-shore habitat quality improvement

15. Lake Sturgeon Habitat Restoration Limiting Factors

Description: This project will provide the necessary information to determine how to proceed with the restoration and enhancement of lake sturgeon spawning habitat in the Green Bay watershed. This information will be essential for planning and implementation of sturgeon spawning habitat restoration or enhancement.

Benefits: Lake sturgeon in Green Bay are limited by the available spawning habitat. To focus restoration and enhancement efforts on the tributaries with greatest potential for success requires information on the quantity and quality of habitat currently available and potentially available above existing barriers. Providing passage above existing barriers, through fish passage or barrier removal, or enhancing habitat currently available will be expensive, and this project will provide the information to focus restoration or enhancement efforts on the most productive areas.

Restoration Goal(s): Fishery resource enhancement, aquatic and near-shore habitat quality improvement

16. Lake Trout Population Enhancement

Description: Funding will be used to address maintenance needs at federal hatcheries that provide lake trout for stocking the waters of Lake Michigan and northern Green Bay within the restoration area. Over time, the ability of the federal hatcheries to consistently rear and provide high quality lake trout for native fish restoration and harvest has been compromised by normal deterioration of the hatchery facilities.

This project will provide funding to address maintenance and construction needs that include the replacement covering of raceways, construction of a new broodstock/incubation building, installation of liquid oxygen and treatment to improve the quality of the water supply.

Benefits: The federal hatcheries are the primary source for lake trout stocked in the restoration area for native species restoration and harvest. This project will ensure future benefits to both restoration and harvest in the waters of Lake Michigan and northern Green Bay.

Restoration Goal(s): Fishery resource enhancement

17. Green Bay National Wildlife Refuge Island Habitat Restoration Project

Description: The Green Bay National Wildlife Refuge presently consists of three islands in Lake Michigan, with two additional islands being transferred to the Fish and Wildlife Service in the near future. All five islands are extremely important as resting sites for migratory birds and are also used by a variety of migratory species for nesting. Aquatic habitat surrounding the islands may be important for different activities of fish found in the bay. Exotic plants have been seen on the islands but the extent of the coverage of the island habitat is not known. An evaluation of the habitat (terrestrial and aquatic) and species use of that habitat needs to be collected to develop a management plan for restoration of the islands. Once a habitat management plan is completed, non-native plants will be eradicated and the area re-planted with native species to restore the island habitat.

Benefits: This project will identify the plants and animals using the islands, and the fish occupying the offshore reefs. Information established regarding wildlife and island habitat would be used to develop a habitat management plan that will assist in the restoration of the islands. This project also involves removal of all exotic vegetation and re-establishment of the native vegetation lost by human degradation.

Restoration Goal(s): Wetland and associated upland habitat re-establishment

APPENDIX B – RESTORING THE RIVER

HUDSON RIVER NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PROPOSAL FORM

Instructions

Please complete as many sections as possible. Your proposal will still be considered even if you are unable to fill out every section. If you need more space, please use additional paper and label appropriate sections. This form is also available in either Word or Word Perfect formats and can be e-mailed or is available on the DEC web site at www.dec.state.ny.us. Send completed forms to Lawrence Gumaer, Natural Resources Damage Unit, NYS DEC, 625 Broadway, Albany, NY 12233-4756; or by e-mail to lwgumaer@gw.dec.state.ny.us.

Your name: _____

Street address: _____

City: _____

State: _____

Zip: _____

Phone: _____

Email: _____

Project Description: Please describe the restoration project.

Project goals: Briefly describe the purpose of the restoration project and explain how the project would address injured resources and/or losses to the public.

Project goals, continued: Will the restoration project accomplish any of the following:

(Please check all that apply.)

- Improve environmental quality (e.g. improve surface water quality, sediment quality, floodplain soils, etc.)
- Improve habitat (e.g. improve riverbottom, aquatic vegetation, wetlands, shoreline, tributaries, and/or adjacent uplands)
- Enhance/restore plant and animal species (e.g. protect/enhance specific wildlife or plants by improving habitat)
- Enhance human uses (e.g. improve swimming and boating, improve wildlife viewing opportunities through creation of informative trails or educational programs)
- Other (please explain):

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

Actions to date: If known, briefly describe any actions, studies or funding commitments that have already been initiated for this project.

Participants: If known, please identify agencies/organizations likely to participate in project.

Contacts: Please provide names, addresses, phone numbers of people knowledgeable about the site and the proposed project.

THANK YOU VERY MUCH FOR YOUR TIME!
PLEASE CALL CONTACT BELOW IF YOU HAVE ANY QUESTIONS.
PLEASE RETURN FORM TO:
Lawrence Gumaer
NYS DEC
Natural Resource Damage Unit
625 Broadway, Albany, NY 12233-4756
Phone: 518-402-8971
Fax: 518-402-9027
lwgumaer@gw.dec.state.ny.us
www.dec.state.ny.us

ABBREVIATIONS

ACOE – Army Corps of Engineers	NEPA – National Environmental Policy Act
CWAC – Clean Water Action Council	NCP – National Oil and Hazardous Substances Pollution Contingency Plan
CAG – Community Advisory Group – U.S. Environmental Protection Agency	NOAA – National Oceanic and Atmospheric Administration
CAP – Cooperative Assessment Project	NPL – National Priorities List
CRAB – Community Restoration Advisory Board	NRDA – Natural Resource Damage Assessment
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act	NBHTC – New Bedford Harbor Trustee Council
CDE – Cornell-Dubilier Electronics	NYSDEC – New York State Department of Environmental Conservation
CWA – Clean Water Act	NYSDOH – New York State Department of Health
DOC – U.S. Department of Commerce	OPA – Oil Pollution Act
DOI – U.S. Department of the Interior	PCBs – Polychlorinated Biphenyls
EIS – Environmental Impact Statement	RCDP – Restoration and Compensation Determination Plan
EPA – U.S. Environmental Protection Agency	RI/FS – Remedial Investigation/Feasibility Study
FCA – Fish Consumption Advisory	ROD – Record of Decision
GE – General Electric Co.	RP – Responsible Party
HRI – Housatonic River Initiative	USFWS – U.S. Fish and Wildlife Service
HRR – Housatonic River Restoration, Inc.	WCA – Waterfowl Consumption Advisory
IGP – Intergovernmental Partnership	WDNR – Wisconsin Department of Natural Resources
MOA – Memorandum of Agreement	

TERMS

Baseline

The condition to which a natural resource is to be restored. The state that would have existed if the hazardous substance were not released, all other things being equal. This does not mean that NRDA restoration will result in some idyllic, pristine condition, but the condition that would have been if the contaminant had not been released.

Cooperative NRDA

The trustees and responsible parties agree to assess and restore damage cooperatively in order to avoid litigation and save time and money.

Injury

An injury to a natural resource is either a physical, biological or chemical change in a particular resource or an exceedance of a regulatory standard designed to protect the resource and its use.

Damages

Are what the trustees can prove have been injured and the amount of money that trustees seek as compensation for injury and loss of natural resources.

Hazardous Substances

CERCLA or the Superfund Law refers to several other environmental laws to identify

over 800 substances as hazardous and many more as potentially hazardous. The law gives the EPA the authority to respond to threats from hazardous substances and to pollutants or contaminants that pose “imminent and substantial danger to public health and welfare or the environment.” The term “pollutant or contaminant” includes, but is not limited to, any element, substance, compound or mixture, including disease-causing agents, which after release in the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, will likely cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including reproductive), or physical deformations in such organisms or their offspring.

Natural Resource Damage Assessment (NRDA)

The studies needed to document and quantify the injuries caused by the hazardous substance release. A thorough and careful assessment of resources potentially injured by the hazardous substance release.

NRDA Plan

Outlines methods used to assess and quantify the injuries.

Preassessment Screen

First step done by trustees to establish that hazardous substance contamination has

injured natural resources and to decide if a full damage assessment is warranted

Responsible Party

Those that are held liable for the cost of cleaning up a release of a hazardous substance and for compensating and restoring damaged natural resources. GE is the responsible party for the Hudson River PCBs superfund site.

Restoration

As defined by NRDA regulation is – action taken to return an injured resource to its baseline condition, as determined by an NRDA taking into account a proposed or completed cleanup. Broader definition includes the preservation of resource prior to being injured.

Services

The physical and biological functions performed by the resource including the human uses of the resource.

Trustees

Federal and state government agencies and Indian tribes entrusted with publicly held natural resources.

Trust Resources

Natural resources held in the public trust, such as plants and animals, fish, birds, amphibians and other wildlife.

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