

Bronx River, New York Ecosystem Restoration Study

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Partners in Restoration



**US Army Corps
of Engineers®**
New York District



Andrew J. Spano, Westchester County Executive
County Board of Legislators

The Bronx River

This basin occupies about 56.4 square miles in Westchester and Bronx counties, New York and is oriented in a north-northeast to south-southwest direction. The Bronx River flows 23 miles south from its headwaters at Davis Brook near the Kensico Dam to the East River outlet. The study area is located in the 7th, 16th and 18th Congressional Districts of New York.

The Bronx River Basin is a sub-watershed under the larger New York Harbor Estuary (defined by the Port District of New York and New Jersey) and the Long Island Sound Estuary. In general, urban development and industrial and residential pollution have degraded water quality, sediment quality, and habitat quality for nearly a century.

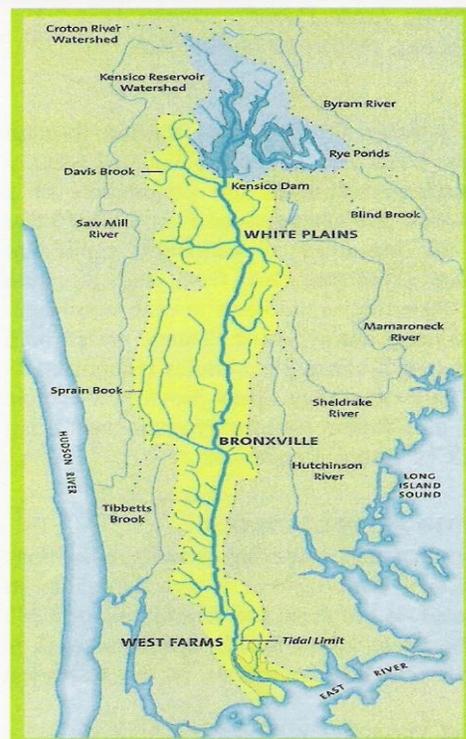
In 1998, Congress directed the Corps of Engineers to conduct a study for ecosystem restoration purposes in response to water resources problems perceived by stakeholders. This study, known as the Bronx River Ecosystem Restoration Study, or simply the Bronx River Study, is co-sponsored by the Corps of Engineers, the New York City Department of Environmental Protection (NYCDEP), and the Westchester County Department of Planning (WCDP).

Significance of Restoration

Ecosystems are dynamic and interrelated complexes of plant and animal communities, including humans, and their associated non-living physical, chemical and biological support structure taken as an integrated unit. Restoration is aimed at achieving balance and resiliency regarding the structure, function and dynamic process of aquatic, wetland and terrestrial habitat complexes. Restoration goals for the Bronx River will focus on identifying essential ecosystem attributes

Did you know?

The Bronx River Basin is part of the New York Harbor and Long Island Sound Estuaries, which are nationally recognized for their significance.



Counties:

- Westchester
- Bronx (Boro)

Cities:

- New York City
- Mt Vernon
- White Plains
- Yonkers

Towns:

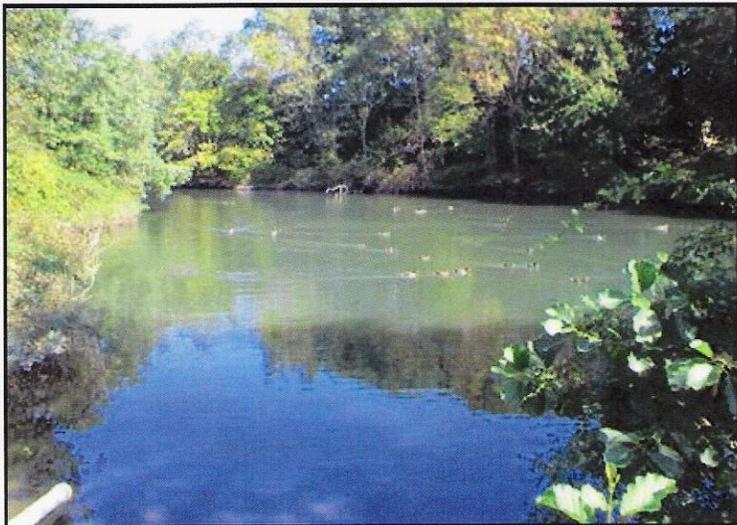
- Eastchester
- Greenburgh
- Harrison
- Mt Pleasant
- New Castle
- North Castle

Villages:

- Ardsley
- Bronxville
- Elmsford
- Scarsdale
- Tuckahoe

Bronx River Basin - Primary Affected Areas

(targets), recognizing that certain irreversible changes have occurred in the watershed, with a view toward achieving measurable "ecosystem services" to attain environmental quality, social well being and economic benefits. The Bronx River is uniquely poised within a largely urban landscape, at the junction of two nationally recognized estuaries, to provide a greater potential for "ecosystem services" that reflect societal values (ie: improved water quality, habitat quality, aesthetics, public health, recreation, etc.) in conjunction with local management plans and initiatives. The goal of the study is to identify and characterize the water resources problems and opportunities, leading to restoration improvement projects that will meet societal values.



Fisher Lane Pond

Westchester County, White Plains, New York

Background

In 1987 the National Estuary Program was formed through amendments to the Clean Water Act. Under the National Estuary Program, the U.S. Congress mandated the preparation of a Comprehensive Conservation and Management Plan (CCMP) that describes the values and resources of nationally significant estuaries, documents the problems each face, and proposes corrective measures to address those problems in each watershed. The Harbor Estuary and Long Island Sound Estuary, which both include the Bronx River, are 2 of the 28 estuaries recognized as nationally significant. The Bronx River Study provides a vehicle to implement many of the Harbor Estuary Program and Long Island Sound Program CCMP recommendations.

Existing Conditions Assessments

In any study, gathering data and preparing existing conditions baseline information is very important, as it directly relates to identifying the water resources problems and formulating possible improvements. Under the Bronx River Study, significant work is underway to characterize existing conditions in the following areas:

- Biological Baseline and Water Quality Sampling/Analysis
- Wetlands Characterization and Functional Assessment
- Bacterial Sources Tracking (BST)
- Hydraulic and Hydrologic Setting
- Cultural Resources Documentation
- Hazardous, Toxic and Radioactive Waste (HTRW)
- Sediment Impact Assessment Model (SIAM)

Results of these preliminary investigations will be summarized in an initial report by Summer 2007. The NYCDEP and the WCDP are participating with the Corps of Engineers in completion of various aforementioned tasks. Completion of this phase of study will allow for transition from background research, to establishing baseline conditions, problem identification, future forecasting in the absence of any improvements, tailoring our restoration goals to make them more specific based on additional information, identifying sites and measures to meet goals, and evaluating costs and benefits of potential restoration projects for implementation, along with any monitoring and adaptive management needs.

Biological Baseline and Water Quality Sampling/Analysis

A multi-season field sampling effort has been conducted to obtain baseline biological and water quality data. A variety of sampling techniques were used to determine the presence/absence of species, species composition, and individual size and biomass. Also, to fully characterize various habitats, water quality parameters (temperature, specific conductivity, salinity, dissolved oxygen, pH, redox and turbidity) continue to be monitored and recorded at various sampling locations by NYCDEP and WCDP. Results are being compiled by the New York State Department of Environmental Conservation (NYSDEC). An informed understanding of existing habitat parameters and physical/chemical support structure will help stakeholders determine the efficacy of potential restoration improvement actions that are sustainable.

Wetlands Characterization and Functional Assessment

Wetlands initially identified using GIS databases are being verified. Characterizations will include detailed descriptions of vegetative communities, soil composition, and hydrologic sources. WCDP is leading an effort to develop a wetland management plan that will assist municipalities and other landowners, land managers, and property owners in better managing the wetland resources in their respective municipalities. Quantitative functional assessments are also being conducted on a representative subset of the wetlands. Because wetlands provide significant ecosystem services through functions (ie: fish and wildlife habitat, sediment trapping, nutrient attenuation, etc.) an assessment of functional utility will help stakeholders in the identification of high priority sites for restoration.

Who is involved in the Bronx River Study?

The New York City Department of Environmental Protection (NYCDEP) and The Westchester County Department of Planning (WCDP) are the Non-Federal sponsors, sharing in the cost and plan development of the Bronx River Study with the Corps.

In addition, there are a number of agencies and organizations that are involved including: The New York/New Jersey Harbor Estuary Program; Westchester County Department of Parks, Recreation and Conservation; Bronx River Alliance; New York City Department of Parks and Recreation; New York State Department of Environmental Conservation; U.S. Fish and Wildlife Service; Wildlife Conservation Society, the Gaia Institute, Save the Sound; National Park Service; and the Hudson River Foundation.

Bacterial Sources Tracking (BST)

The Harbor Estuary Program CCMP and the Long Island Sound Program CCMP indicate that pathogens are a significant concern in New York Harbor and Long Island Sound water bodies. Additionally, the Bronx River Alliance's Ecological Restoration and Management Plan indicates that pathogens are a significant concern specifically in the Bronx River watershed, as this is a component of the chemical support structure of aquatic habitat. The Bronx River is also listed on the NYSDEC 2002 Section 303(d) list for pathogens. The objectives of the BST are to identify areas of concern, improve our understanding of the types and sources of E.coli populations at various locations, and the identification of the relative input of sources of fecal E.coli. The BST effort includes a thorough review of existing pathogen monitoring data, land use data, and nutrient and storm water hot spot identification. Water samples are being taken at various locations and tested under Antibiotic Resistance Analysis to identify and verify species patterns. This work will help identify the dominant pathogen sources, enhance understanding of the inputs and facilitate development of best management practices to address fecal contamination pollution.

Hydraulic and Hydrologic Setting

This work forms part of the physical support structure for ecosystem restoration: water supply. Tasks include developing a numerical computer reproduction of the hydrologic (rainfall, runoff, base flow) water cycle behavior and the hydraulic (water surface elevations, velocities and discharges) behavior of the watershed. These relationships between rainfall, stream flow and water elevations are critical in evaluating water budgets for wetlands and in assessing water quality and sedimentation trends based on flow rates and residence times.

Cultural Resources Documentation

A baseline cultural resources investigation is being conducted to ensure that significant historic resources such as structures, viewsheds, landscapes, and archaeological sites (ie: The Bronx River Parkway Reservation in Westchester County is on the National Register of Historic Places) are identified and not impacted by proposed project actions. As a Federal undertaking, the Bronx River Study is subject to review under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Results of investigations will be coordinated through the New York State Historic Preservation Office and will help guide the application of restoration measures and projects.

Did you know?

Westchester County is implementing and designing storm water management and natural resource restoration pilot projects and working with municipalities and others to develop a comprehensive watershed management plan aimed at improving water quality by controlling polluted storm water.

Did you know?

Estuaries are critical areas of transition where salt water and fresh water mix to support unique, valuable, and integrated plant and animal communities known as ecosystems.



*Soundview Park
Bronx County, New York*

Did you know?

The New York City Department of Environmental Protection is preparing a Long Term Control Plan to address Systemic Combined Sewer Outfall abatement.

Hazardous, Toxic, and Radioactive Waste (HTRW)

A Corridor Assessment (CA) is being undertaken to identify sites with potential environmental concerns. The CA will inventory and categorize properties based on known or potential contaminant presence and recommend further study of an area if it could impact any proposed future restoration action. Existing and prior land use is being determined by examination of aerial and historical photographs, local land-use records, and interviews with local residents. The U.S. Environmental Protection Agency (USEPA), NYSDEC, and WCDP files are being reviewed to determine known locations of Comprehensive Emergency Response, Compensation, and Liability Information System (CERCIS) and Resource, Conservation and Recovery Act (RCRA) sites, underground storage tanks, illegal dumps, and landfills within the project study area. These investigations are essential in differentiating between remediation and restoration projects, which have complementary, but different goals.

Sediment Impact Assessment Model (SIAM)

The Sediment Impact Assessment Model (SIAM) provides a framework to combine hydrology, hydraulics, and sediment supply into a geomorphic assessment and rehabilitation design for a series of reaches representing a network of channels.

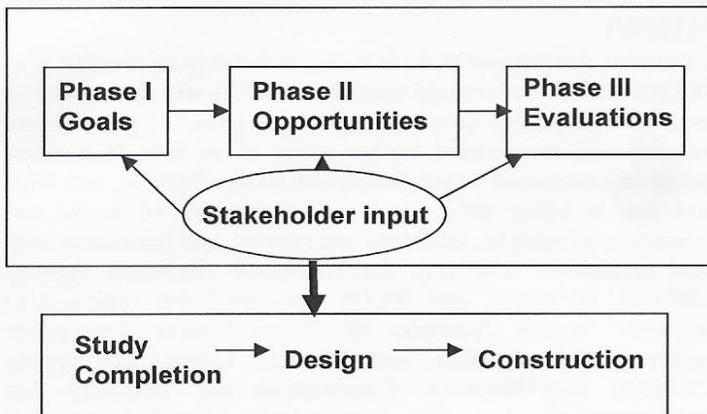
A key component of the SIAM is its ability to assess short-term changes in sediment delivery and the potential morphological response to sediment management features such as bank stabilization, grade control structures, flow control, land treatments, or any other measure that alters the flow and /or sediment regime. Sediment is a significant pollutant in streams and a contributing agent in many others. The SIAM aims to integrate watershed-scale sediment continuity concepts into stream qualitative evaluations and comprehensive mobile boundary numerical models. This is an important tool in assessing impacts, stability and sustainability by showing areas of accretion, degradation and equilibrium along defined reaches to evaluate restoration scenarios.

The Path Forward

Currently, the Corps of Engineers is working in collaboration with Non-Federal sponsors and partners to complete existing conditions assessments as the starting point for additional work. The process leading to the development of restoration plans will consist of three phases that will include stakeholder input.

Based on the water resources problems, we will tailor goals for the Bronx River during Phase I. Then, we will identify qualifying opportunities (sites or measures) to achieve goals in Phase II; and lastly, we will evaluate the merits considering the significance of improvements versus costs during Phase III. The details of how restoration plans will be developed and implemented will be presented in a publication that will be completed in the coming months.

The Process



Getting Involved

Close coordination with stakeholders is essential for the Bronx River Study to move forward. Ways in which stakeholders can get involved include:

- ✓ *Serve as non-Federal sponsors to co-fund a recommended site.*
- ✓ *Identify and secure appropriate resources on Federal, State and local levels.*
- ✓ *Raise support for the overall plan or individual components.*
- ✓ *Provide specific site recommendations for inclusion in the restoration plan.*
- ✓ *Stay abreast of various interim studies.*

- The Bronx River Basin is an exceptional resource that belongs to the people who live within the boundaries of its watershed.
- A firm commitment by stakeholders and organizations to collectively support restoration objectives can help move this study forward.
- The Corps of Engineers is committed to working with its partners and stakeholders to develop a restoration plan designed to meet the study objectives consistent with the Harbor Estuary Program CCMP, the Long Island Sound CCMP and broad Hudson Raritan Estuary Study.
- Plan implementation will move the Bronx River toward the rich, urban, unique and diverse mosaic of habitats in sustainable balance which we all hope to achieve.

For more information about the Bronx River Study please contact:

FRANK VERGA:
Frank.Verga@usace.army.mil
U.S. Army Corps of Engineers

CHRIS VILLARI:
CVillari@dep.nyc.gov
New York City Department of
Environmental Protection

ROB DOSCHER:
rrd1@westchestergov.com
Westchester County
Department of Planning