



## Protecting New York City's Water Supply Through the Use of Riparian Forest Buffers



### BACKGROUND

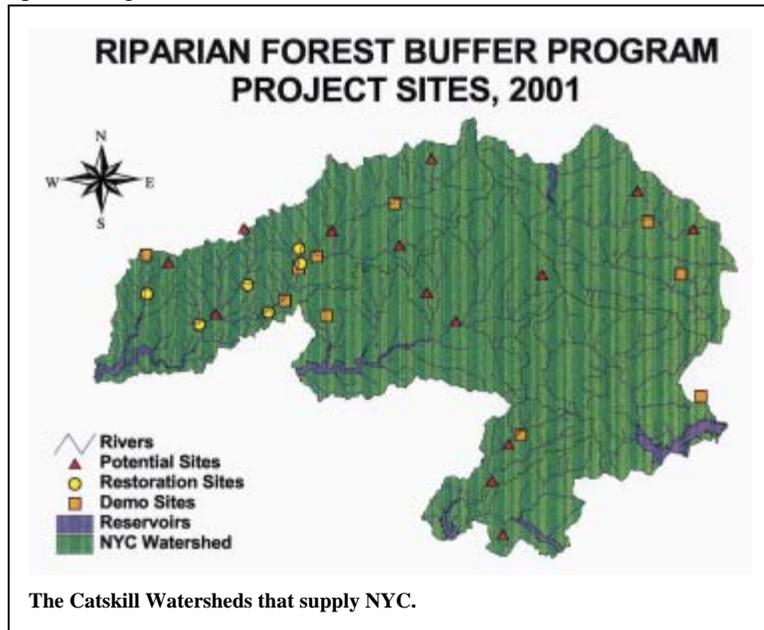
The Catskills Region of New York provides a reliable source of high-quality water to the nine million residents of the New York City (NYC) metropolitan region. Watersheds in this area are heavily forested but contain substantial agricultural lands and numerous small towns and villages. Once the state and city finalize their land acquisitions over the next few years, 61 percent will be privately owned and approximately 38 percent will be purchased by the State and City to protect critical watershed areas.

The resident population of the watersheds consists of nearly 70,000 located in portions of Delaware, Greene, Schoharie, Sullivan, and Ulster Counties. Forests constitute 75 percent of the total land area in the five Catskill/Delaware watershed counties. The geologic history makes the area's watercourses especially susceptible to bank erosion and sedimentation.

If NYC's water supply is not protected at its source, the City may be required to construct a multi-billion dollar treatment plant in order to meet Federal safe drinking water standards. This possibility was a contributing factor to the initiation of the Riparian Forest Buffer Program.

With funding from the USDA Forest Service, the Watershed Agricultural Council (WAC) began a Riparian Forest Buffer Program in 1999. This two-year pilot project will protect and restore streamside resources in the NYC watersheds. As part of the Riparian Forest Buffer Program, WAC coordinates a network of professional resources to support the implementation of riparian forest buffers. WAC provides technical assistance, cost-sharing opportunities, and educational materials about the benefits of riparian buffers to landowners, environmental educators, and

community groups who assist with planting and restoring riparian areas. The riparian buffer program is one component of a larger effort intended to ensure the continued delivery of high-quality water to NYC.



### LOCATION

The NYC watershed is a surface water system that provides an average of 1.34 billion gallons of high quality drinking water to NYC each day. Approximately 90 percent of this water comes from the 1,580 sq. mile Catskill/Delaware watersheds, west

of the Hudson River. Two of the major watersheds are the East and West Branches of the Upper Delaware River.

### ISSUES BEING ADDRESSED

Land use changes in many parts of the watershed have removed native riparian vegetation, subjecting these areas to erosion and reducing their buffering and pollutant-trapping capabilities.

Development, agriculture, and timber harvests have altered or entirely removed the original riparian forest corridor along 75 percent of the streams in the Catskills. This loss has resulted in increased erosion, increased run-off to streams from land-based activities, and degradation of stream system health and stability.

“There was a critical need for buffer awareness and buffer planting in the Catskills,” said Brian Fisher, Watershed Forestry Program Manager from the Watershed Agricultural Council. “Water quality is the driver,” he added.

Since 1999, the Northeastern Area and the Northeastern Area Association of State Foresters have sponsored a cooperative challenge grants program to promote watershed health and restoration through the conservation, restoration, and sound stewardship of trees and forests.

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## GOALS

The overall goals of the project are to establish the programs and resources necessary to aid and encourage all landowners in becoming active stewards of their riparian corridors. To accomplish this, the project will:

- Develop a Geographic Information System (GIS)-based assessment of riparian areas and a system for targeting restoration and tracking progress.
- Establish native seeding nurseries.
- Conduct contractor training in restoration.
- Support buffer implementation on watershed farm sites.
- Compliment the Conservation Reserve Enhancement Program (CREP). CREP is a reforestation program that targets agricultural land along stream corridors. NYC Department of Environmental Protection (DEP) and USDA, which seek to establish 2,000 acres of riparian forest buffers by 2002, funds CREP. WAC's Riparian Forest Buffer Program assists landowners with buffer and corridor restoration work on non-agricultural lands and lands that do not qualify for CREP.
- Promote the use of riparian forest buffers and build capacity to properly plan and install them. Increase knowledge and capability to provide appropriate planting stock.

In addition, the program will work to retain a working landscape that can provide forest products, economic return to rural communities and forest landowners, and open space for recreation and wildlife habitat, while providing a high level of protection for the water supply and sustaining forest cover.

## METHODOLOGY

The goals will be carried out through the use of education and outreach, the development of various projects, the use of demonstration sites, and forest products development.



Tree shelters protecting hardwood seedlings from deer near Walton, NY.

This project builds on and supports existing efforts; leverages private, Federal, and NYC Department of Environmental Protection (DEP) funds; provides a mechanism for prompt and effective use of targeted CREP funds; demonstrates the use of trees and forests to protect water quality; and provides other ecological benefits associated with riparian zones.

## OUTCOMES / ACCOMPLISHMENTS

The following is a synopsis of the progress and results of the project.

### **Riparian Forest Buffer Re-establishment**

The ability of NYC and WAC to address riparian zones and benefit water quality and resource conditions is being significantly improved. To date, the project has resulted in the establishment of over 7 miles of new riparian buffers in the targeted watersheds.

Appropriate native planting stock and containerized seedlings for riparian buffer establishment are being identified, evaluated, and made available from the State Forest Nursery to meet planting needs.

“Whole Farm Planning” professionals have greater awareness and expertise regarding usefulness, specifications and implementation of riparian forest buffers through training and workshops.

Improved and enhanced technical guidelines and specifications are available for professional use regarding design and installation of riparian forest buffers, based on local field experience.

An assessment is being made of potential commercial opportunities from sustainable management and harvest of specialty crops in riparian buffers, such as floral products from willow cultivars.

Over 160 participants attended a 1-day Riparian Forest Buffer Workshop in Delaware County. The workshop featured national riparian experts from across the country.

### Riparian Forest Corridor Stewardship

With 75 percent of riparian corridors in the Catskills presently in a forested or early-successional condition, landowner stewardship is an important piece of the puzzle. Professional foresters are being trained to identify riparian areas on forested properties, develop riparian management objectives with their clients, and develop silvicultural recommendations to maintain and enhance riparian functions.

### Riparian Planning Incentive

WAC provides a financial incentives program to assist landowners in obtaining these services as part of a comprehensive forest management-planning program for the Watershed. Landowners who commit to develop and

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implement a riparian forest management plan can receive additional cost-share compensation for this commitment. Additionally, the delineation of riparian areas through this process may one day provide a foundation for additional conservation-oriented tax incentives and forest stewardship programs.

#### Resource Development

WAC is taking a step toward improving tree and plant survival by having nurseries grow containerized seedlings. The use of containerized, or root-balled, seedlings could substantially improve WAC's ability to meet its goals by allowing planting during late spring and fall periods. The economic opportunity afforded to local growers will be assessed, and successful efforts will be documented.

**Pilot Planting Projects:** To better understand the benefits and limitations of using larger seedling stock at the field-level, three test sites were planted during the fall of 2000.

**Pilot Nursery Projects:** WAC has teamed with the state nursery to provide native, bare-root stock for local private and non-profit growers for conservation planting projects.

#### **GIS PROJECT**

WAC is using GIS applications to locate and characterize riparian corridors on a watershed scale. GIS provides a basic tool for assessing the condition and extent of buffers in the NYC Watersheds for program planning.

A pilot digital hydrology network is being established, using GIS technology for coordinated use by natural resource professionals and resource managers.

#### **EDUCATION AND OUTREACH**

WAC established a Riparian Forest Buffer Coordinator to implement the project and serve on a multi-agency team comprised of local, NYC, state, and federal partners.



**On this site, 200 yards of eroding stream bank was reshaped and stabilized with rock veins and willow prior to riparian forest seedling planting.**

Educational programs and outreach activities are targeted at forest landowners, water consumers, government officials, environmental groups, and other audiences. Education is also promoted through newsletters, press releases, and speaking engagements.

WAC supports a conservation education partnership. Called "Green Connections," this learning experience focuses on common lesson themes and shared projects between the upstate/downstate classes. WAC personnel have talked to nearly 500 students in one year about the NYC watersheds and buffer-related issues.

As a result of education and outreach, landowners and communities have a heightened awareness and recognition of the value and importance of riparian forest buffers for water quality, wildlife habitat, and biodiversity.

#### Demonstration Sites

Several demonstration sites such as arboretums, nurseries, and other publicly accessible locations have been established. One site, located at the AmeriCorps Outdoor Education Center in Delhi, New York, is used as an educational facility, and includes a seedling nursery, stream corridor reforestation area, and stream bank stabilization project. WAC and AmeriCorps have planted 13 to 15 different species of trees and shrubs. This site will serve as a test area to determine what trees do best on retired agricultural land. The site is also the home base for an AmeriCorps "Stream Team," which conducted educational activities for over 300 students in its first year including buffer planting and stream monitoring.

#### Other Projects

A forest corridor along the West Branch of the Delaware River has been established on 17 acres.

The Burgin/Kilmer fall planting site, located on a steep hillside, is testing the use of larger planting stock and alternative planting techniques.

The Nature Conservancy (TNC) has been integrating riparian stewardship concepts into forest management plans. Loggers, foresters, and landowners have attended several workshops on TNC property.

Bank stabilization and tree planting occurred on a 70-foot stream reach along Trout Creek. This is an example of coordination with other programs, such as CREP, on farmland.

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## PARTNERS

- NYS Department of Environmental Conservation
  - Division of Lands and Forests
  - Division of Water
- NYC Watershed Agricultural Program
- NYC Department of Environmental Protection
- Cornell Cooperative Extension
- USDA Natural Resources Conservation Service
- Catskill Forest Association
- SUNY College of Environmental Science and Forestry
- Cornell University
- Private sector consultants (forestry, agricultural planning)

## FUTURE PLANS

An accomplishment report will be prepared documenting efforts, collaborations, results, and impacts of the entire pilot project.

Additional uses of GIS will be explored during subsequent phases of the Riparian Forest Buffer Project.

WAC will continue using an “Incentive Driven” approach in working with landowners. This will create opportunities for positive learning and decision making that will benefit both the environment and themselves. Landowners have a unique resource in riparian buffers. They will begin to understand that protecting the NYC Watershed is important to them. And WAC is getting them up to speed.

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