

## EVALUATING RECEIVING WATER IMPROVEMENTS FROM STREAM RESTORATION (ACCOTINK CREEK, FAIRFAX CITY, VA)

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### IMPACT STATEMENT

The output from this project will provide information and guidance to Municipal Separate Storm Sewer System (MS4s) operators and states on the performance of selected Best Management Practices (BMPs). Specifically, stream restoration techniques for improving biological and in-stream water quality within an urban watershed will be provided. These data support The U.S. Environmental Protection Agency's Office of Research and Development's (ORD) transition into effectiveness research.

### BACKGROUND:

The inception of the Clean Water Act (CWA) in 1972 has had a positive effect on the quality of our nation's water; however, many bodies of water are still in poor condition. According to the 1998 National Water Quality Inventory (a biennial summary of State surveys of water quality), approximately 40% of assessed streams, lakes and estuaries are so polluted that they do not support designated functions such as fishing and swimming. A leading source of this affliction is polluted runoff from agricultural lands and urban areas. EPA supports the installation of BMPs to maintain or restore aquatic environments' pollution to safe levels.

### DESCRIPTION:

This ORD National Risk Management Research Laboratory project involved the monitoring of 1,800 linear feet of degraded stream channel before and after the restoration of the North Fork of Accotink Creek from Lee Highway to Old Lee Highway in the City of Fairfax, Virginia. Restoration included the installation of native plant materials along the stream and bioengineering structures to stabilize the stream channel and bank. The intention of these actions was to restore the stream channel to a stable condition and reduce stream bank erosion, thereby reducing sediment loads in the stream.

In-stream samples were collected and analyzed for physical, chemical and biological parameters to document the changes in stream quality as a result of the restoration project. The goals of this project were to:

- Investigate the effectiveness of BMPs, specifically:
  - Stream restoration techniques and other potential watershed enhancements.
  - Methods to increase the area of available biological habitat.
  - Improving water quality in the impaired stream.
- Demonstrate the utility of continuous water-quality monitoring as an innovative, cost-effective tool for detecting water-quality improvements that are related to BMP implementation activities.

- Identify specific impairments of concern within the stream corridor and upland areas and recommend additional management practices to improve the overall water quality in these areas.

EPA GOAL: Goal #2 -Clean & Safe Water; Objective 2.2.1 - Improve Water Quality on a Watershed Basis

ORD MULTI YEAR PLAN: Water Quality (WQ) Long Term Goal - WQ-2 Protection and Restoration of Aquatic Systems

**RESEARCH PARTNERS:**

*Contractors:* PARS Environmental

*Collaboration:* EPA Region 3; U.S. Geological Survey; City of Fairfax; Virginia Department of Environmental Quality

## **EXPECTED OUTCOMES AND IMPACTS**

The most effective BMPs for improving the in-stream water quality in urban watersheds will be determined. These will be presented to MS4 operators and the states in order that these BMPs will be implemented. Improved water quality in urban watersheds will in turn lead to better ecological and human health in watershed areas.

## **OUTPUTS:**

EPA (September 2008). *Evaluation of Receiving Water Improvements from Stream Restoration (Accotink Creek, Fairfax City, VA)*, EPA/600/R-08/110.

*Evaluating the Accotink Creek Stream Restoration Project for Improving Water Quality, In-Stream Habitat, and Bank Stability*, Water Practice, Volume 2, Issue 1, pp. 1-11, January 2008.

*Role of Stream Restoration On In-Stream Water Quality In An Urban Watershed – A Case Study*, Journal of Ecotechnology, Vol. 3, No. 2, December 2007, Republic of China.

*Effects of Stream Restoration on In-Stream Water Quality in an Urban Watershed*, TMDL 2007 Conference in Bellevue, WA, June 24-27, 2007.

*Role of Stream Restoration on Improving Benthic Macroinvertebrates and In-Stream Water Quality in an Urban Watershed - A Case Study*. Scheduled for publication in ASCE Journal of Environmental Engineering in January 2010.

## **RESOURCES:**

EPA (2008). *Evaluation of Receiving Water Improvements from Stream Restoration:*

<http://www.epa.gov/nrmrl/pubs/600r08110/600r08110.pdf>

Urban Watershed Management Research: <http://www.epa.gov/ednrmrl/>

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Water Quality