

# ANTIETAM CREEK-TARGETED WATERSHED PROJECT- MARYLAND

The Washington County Soil Conservation District and its many partners report outstanding progress in improving water quality in Antietam Creek Watershed, Washington County, Maryland. Antietam Creek, a major tributary of the Potomac River, includes Marsh Run, Little Antietam Creek, and Beaver Run subwatersheds. The Antietam Creek Targeted Watershed Project is an example of the effectiveness of conservation partnerships working to solve common water resource problems.

Even though the watershed is urbanizing, agriculture is the major land use in the watershed.

## Land Use Statistics

	Marsh Run	Little Antietam Creek	Beaver Creek
Cropland	61.9%	41.6%	45.9%
Pasture	13.8%	6.1%	6.5%
Orchard	----	9.8%	1.1%
Forest/Recreation	7.6%	39.2%	40.5%
Urban	8.7%	3.0%	3.3%
Industrial/other	8.0%	0.3%	2.7%



The predominately agricultural Antietam Creek Watershed was ranked near the top of Maryland's Nutrient Control Priority Watershed List with a rating index that ranked it 8<sup>th</sup> in the State for nutrient loading to the Chesapeake Bay.

*Runoff from animal feeding area prior to Manure Management System installation.*

Local stream and water quality concerns include excessive streambank erosion, siltation, nutrient enrichment, algal growth, pathogen contamination, elevated stream temperatures, loss of fish habitat and fishery, and loss of riparian habitat.



In addition to nutrient loading to the Bay and local water quality issues, this watershed was also targeted due to concerns about protecting several Washington County designated “Special Planning Areas” such as the Powell Trout Hatchery, the South Mountain Natural Environmental Area, the Greenbrier State Park, Appalachian Trail Corridor, and Antietam National Battlefield. Edgemont and Smithburg Reservoirs, standby water systems for the city of Hagerstown, also lie within the watershed.

***Typical livestock operation illustrating sources of sediment and animal wastes***

The numerous agricultural operations within the watershed include dairy and beef farms, cash grain farms, and orchard/horticulture operations. Runoff from these operations carry nutrients, sediment, pesticides and organic wastes to Antietam Creek and its tributaries.

The Conservation District recognized the need for accelerated efforts towards implementing conservation practices, as well as, conservation education in the county.



***Completed animal waste storage facility installed to collect and store animal and dairy wastes, and control pollution from runoff.***

In 1992 Little Antietam Creek and Marsh Run subwatersheds were selected to be a "Targeted Watershed Project". The project was expanded in 1996 to include the Beaver Creek Watershed. EPA Nonpoint Source Grant funding from Section 319 of the Clean Water Act was obtained through the Maryland Department of Agriculture to employ a Soil Conservation Planner to complete a watershed assessment and to begin educational efforts in the targeted subwatersheds. A Conservation Technician was hired to help install Best Management Practices (BMPs) identified by the planner in Soil and Water Conservation Plans.



A Nutrient Management Specialist was also employed to make recommendations to farmers in the form of Nutrient Management Plans to address storage, handling, and application of commercial fertilizers and animal wastes. Funds were also earmarked for implementation of innovative practices that protect water resources.

*Armored stream crossings, fencing and forested buffers are used to reduce nutrients*



*Hardwood riparian plantings and livestock watering tank funded thru CREP.*

Through a variety of financial and technical assistance programs, farmers were encouraged to adopt soil and water conservation practices to help reduce agricultural runoff entering streams of the watershed by:

- Reducing or eliminating soil erosion through the implementation of BMPs
- Reducing pollution from animal wastes and stream bank erosion by redesigning animal movements and activities to keep livestock away from streams
- Protecting water quality and wildlife by minimizing the application of fertilizers and pesticides



Targeting natural resource conservation programs to landowners in this watershed also gave the Washington County Soil Conservation District and the USDA-Natural Resources Conservation Service (NRCS) expanded opportunities to work with the large concentration of Mennonite Farmers who have historically not participated in USDA conservation programs.

***Looking upstream at the confluence of Beaver Creek and Hatchery Branch. Channel has eroded nearly five times original width.***

Since the start of the project in 1992, there has been great success in planning and installing conservation practices. In one sub-watershed, Marsh Run, conservation planning on the watershed's acres increased from 32% to 91%, tripling the number of acres under conservation plans. Through cost-share funds provided by a variety of Federal, State and local conservation programs and technical assistance provided by the District, and its Federal and State conservation partnering agencies, the water quality in Antietam Creek Watershed has been improved by the implementation of a variety of BMPs or conservation practices. These include: animal waste management systems, waste storage structures, roof runoff control projects, clean water diversions, stream fencing, "off-stream" or alternative livestock watering facilities, planting riparian forest buffers, installing waterways, and applying more than 3,000 acres of conservation rotation or tillage practices to agricultural land.



As previously mentioned, severe streambank bank erosion was occurring in the watershed due to many years of uncontrolled cattle access to streams. Several instream rock structures ("W" vanes, barbs) have been installed at various points in the streams protects the embankments. In addition to the rock structures, stream banks have been seeded and trees planted to protect soil from erosion during times of high flow.

***Severe streambank erosion and channel instability at the confluence of Beaver***





***Beaver Creek project after channel was restored to original location and size, and streambanks were sloped back to provide a more stable vegetated area for higher stream flows.***

In addition to stabilizing the stream banks, the woody vegetation helps maintain cool water temperatures for fish habitat while fruit bearing varieties are promoting wild bird habitats.

Inspired by the President's Clean Water Action Plan, Antietam Creek watershed had more than 2,900 acres of winter cover crop used as a demonstration area. Additionally, in 1999, the District worked with a landowner to develop an educational stream restoration project, to help other farmers recognize the benefits of natural resource conservation programs. The Soil Conservation District and NRCS provided technical assistance on a 1.5 acre Mitigation/Wetland created for the Boonsboro School Complex as public education training on wetlands.



***Cover crops installed under Federal grant funds to reduce erosion and utilize excess***

Water quality monitoring conducted by Maryland Department of Environment has shown a significant decline in nutrients and sediment. Riparian habitat and the trout fishery have improved dramatically. Eroding stream banks along restored sections of Beaver Creek have been stabilized and the channel has been restored to more natural conditions.



***Completed Beaver Creek restoration project one year after construction, a stark contrast to the pre-construction photos.***

## Cooperating Agencies and Roles

### **Washington County Soil Conservation District (WCSCD)**

Project sponsor and proponent. Responsible for implementation of the agricultural program aspects.

### **U.S.D.A. Natural Resources Conservation Service (NRCS)**

Provide technical supervision for development of Soil Conservation and Water Quality Plans, and the installation of Best Management Practices (BMP's) and systems.

### **Maryland Cooperative Extension Service (MCES)**

Has primary responsibility for the information and education programs for both rural and urban activities. Supervises the nutrient management and Integrated Pest Management (IPM) programs.

### **Maryland Department of Agriculture (MDA)**

Assists WCSCD by providing operating support, staff support, and cost-share funds for BMP installation.

### **Maryland Department of Environment (MDE)**

Responsible for providing technical and financial support for urban activities in addition to their regulatory and enforcement responsibilities.

**Maryland Department of Natural Resources (DNR)**

Through its Forest Division and Wildlife Division, provides technical and financial assistance on some agricultural activities and on silvicultural activities including riparian plantings.

**U.S.D.A. Farm Services Agency (FSA)**

Provides financial assistance to landowners for installation of BMP's

**Washington County Health Department**

Provides staff for technical assistance, regulatory and enforcement programs.

**Washington County Commissioners**

Through various departments, provides staff for technical assistance, regulatory, and enforcement programs for erosion/sediment control, and stormwater management control programs.

**U.S. Geologic Survey (USGS) & Maryland Geologic Survey (MGS)**

Has a network of stream monitoring stations and spring/well locations which they use to monitor water quality.

**U.S. Environmental Protection Agency (EPA)**

Provides funding for staff and BMP installation.