

**Watershed Restoration Action Strategy (WRAS)
State Water Plan Subbasin 13C
Conococheague and Antietam Creeks
Franklin and Adams Counties**

Introduction

The 609-square mile subbasin 13C is part of the Potomac River basin. Major streams in the subbasin are the Conococheague Creek, 503 square miles, and its largest tributary the West Branch Conococheague Creek, 199 square miles, and Antietam Creek, 113 square miles. The Conococheague Creek originates on South Mountain, north of Caledonia Park. The West Branch originates farther north on Blue Mountain and flows southwest through a narrow forested valley, forming a tail-like northern extension of the subbasin, paralleling the adjacent northeasterly flowing Conodoguinet Creek, a tributary of the Susquehanna River. The major streams in the subbasin flow into Maryland before entering the Potomac River. The subbasin is part of **HUC Area 2070004, Conococheague Creek**, identified as a Category I watershed under Pennsylvania's Unified Watershed Assessment.

Geology/Soils

The eastern quarter of the subbasin lies within the Blue Ridge Ecoregion, Northern Igneous Ridges (66a) and Northern Sedimentary and Metasedimentary Ridges (66b). This region, known as South Mountain in Pennsylvania, is an area of highly folded and faulted rugged mountain ridges and narrow valleys underlain by Precambrian and Cambrian rock. The steep slopes are mostly forested and streams are cool and clear with high gradients and many riffles. Conococheague Creek and its tributaries Birch Run and Rocky Mountain Creek originate in 66b, which is comprised of erosion resistant quartzite, phyllite, schist and conglomerate. These white to pink rocks are composed mainly sand particles and yield little or no buffering capacity to streams flowing through them. Several streams in these mountains have pH less than 5.5 year round and support very few aquatic insects and fish. Two of Chambersburg's water supply reservoirs, one on Long Pine Run and one on the upper Conococheague Creek are extremely acidic. The southern portion of South Mountain, also called Piney Mountain, is in 66a, and consists of metarhyolite and metabasalt. Streams flowing through these strata have higher pH and alkalinity and support a more diverse aquatic insect assemblage and native brook trout.

When the Conococheague Creek leaves South Mountain, it flows into limestone strata of the Ridge and Valley Ecoregion, Northern Limestone/Dolomite Valleys (67a). This area is characterized by broad, level to undulating extensively farmed valleys, where sinkholes and other karst features have developed. Stream gradients are generally low and flow is often subsurface. Spring fed streams usually have plentiful year round flow unless they have been altered by water withdrawal or habitat modification.

West of the limestone valley is the Northern Shale Valleys Ecoregion (667b). This region is characterized by its rolling agricultural valleys and isolated low hills underlain by shale, siltstone and fine-grained sandstone of the Martinsburg Formation. These rocks tend to adsorb less precipitation than the limestone rocks and have greater stream drainage densities, average stream

size, surface runoff and soil erosion. Resultant stream turbidity and stream habitat impairment can be high even in areas unaffected by man.

West of 67b and in the upper tail of the subbasin is the Northern Sandstone Ridges Ecoregion (67c), which is the highest terrain of the subbasin. Contour lines are straight and parallel, crest elevations are over 1200 feet. High gradient streams flow off the ridges into narrow valleys. Some of these streams are poorly buffered and subject to acidification.

Land Use

Ecoregion and geology/topography is the major determinant of land use in this subbasin. The eastern portion in the South Mountain (Blue Ridge) and the upper western tail in the sandstone ridges are forested and largely state owned. The limestone and shale valleys in the middle of the subbasin are in agricultural and urban land use. Urbanization has been spreading out from Chambersburg and along the US Route 30, PA Route 16, and I-81 corridors. Truck stops and motels are located along I-81 near Greencastle, above the Maryland State line. The population of the subbasin was 110,230 in 1990 and is projected to increase to 121,473 by 2040.

Natural/Recreational Resources:

Michaux State Forest and Mont Alto and Caledonia State Parks on South Mountain; Buchanan State Forest at the western edge of the watershed, and State Game Lands north of Fort Loudon adjacent to Broad Run. Chambersburg and Waynesboro water supply reservoirs are located on South Mountain, Long Pine Run and upper Conococheague, and East Branch Antietam Creek.

The PA Fish and Boat Commission has designated the following streams as Class A trout waters, the highest biomass category:

- East Branch Antietam Creek, brook trout, headwaters down to Waynesboro Reservoir (2.5 miles, Adams County)
- West Branch Antietam Creek, brook trout, headwaters down to SR0997(3.4 miles, Franklin County)
- Broad Run, brook trout, headwaters down to tree farm lane (6.2 miles, Franklin County)
- Falling Spring Branch, rainbow trout, source down to T-519 bridge (1.8 miles, Franklin County)
- Carbaugh Run, brook trout, headwaters to Carbaugh Run Reservoir (1.6 miles, Adams County)

DEP Chapter 93 Exceptional Value (EV) and High-Quality (HQ) Stream Listings:

- No EV streams
- HQ streams:
 - Falling Spring Branch, source to Guilford Township-Chambersburg border
 - Muddy Run
 - Township Run
 - Broad Run
 - Buck Run
 - East Branch Antietam Creek, source to Vineyard Run
 - Vineyard Run

Water Quality Impairment

Impairments in the subbasin are of two sources, agricultural and urbanization. Specific nonpoint source pollutants include nutrient enrichment, siltation, low DO, turbidity, habitat and flow alteration, and taste and odor. In addition to nonpoint source pollution, point source pollution from municipal sewage plant discharges adds additional nutrients and chlorine to streams.

Monitoring/Evaluation

Assessment under the Department's unassessed watershed program began in 1998 and was ongoing in 1999. Impairments were identified as nonpoint source: siltation, turbidity, and excess nutrients from grazing and crop related agriculture, habitat modification, organic enrichment/low DO and siltation from urban runoff/storm sewers, oil and grease, taste and odor, and siltation from land development and small residential development. Municipal point sources were also causing impairment in the form of excess chlorine, flow alterations, and nutrients.

Future threats to water quality

Urbanization may become a more significant factor in nonpoint source pollution as commercial and residential development continues to extend out from Chambersburg, Waynesboro, and along I-81. Future threats include increased stormwater runoff and streambank erosion throughout the subbasin and groundwater pollution and lowering of aquifers in the limestone region.

Restoration Initiatives

Pennsylvania Growing Greener Grants:

- Franklin County Conservation District (FY2002):
 - \$90,353 for streambank restoration of Welsh Run.
 - \$12,713 for streambank restoration of Wilson Run.
- \$32,860 (FY2000) to Wilson College to develop education and research programs and curricula, a web page and community outreach program, and purchase equipment for research and education programs.
- \$51,000 (2000) to the Falling Spring Greenway, Inc. to conduct a fluvial geomorphic assessment and design for a restoration of 4,000 feet of streambank, create 6 acres of wetland habitat, and restore 40 acres of riparian buffer within the Quarry Meadow area.
- \$14,600 (1999) to the Franklin County Conservation District to convert a partially filled pond into a wetland to capture barnyard runoff from a dairy farm that drains into the West Branch Antietam Creek.
- \$255,250 (1999) to the Franklin County CD to restore aquatic habitat and drinking water quality to the Back Creek watershed through agricultural BMP's. Implementation will consist of agricultural waste management systems, conservation tillage, grassed waterways, streambank fencing, and wetland restoration. A water quality monitoring station will be installed in cooperation with USGS to document the effects of the BMPs.
- \$14,600 (1999) to Franklin County CD to convert a partially filled pond into a wetland to capture barnyard runoff from a dairy farm that drains into the West Branch Antietam Creek. A retention pond will be constructed and streambank fencing will be installed.

US EPA Clean Water Act Section 319 Grants:

- \$4,684 (FY2002) to the Franklin County Conservation District for installation of cattle crossings on West Branch Antietam Creek.
- \$10,000 (2000) to Guilford Township for stream buffer plantings in their new township park on and unnamed tributary of Conococheague Creek locally known as English Valley Run.

Other:

- Franklin County Conservation District received a \$24,077 (1995) reimbursement for administration of the DEP Chapter 105 stormwater management program.
- Chambersburg High School received a Chesapeake Bay nonpoint source pollution mini-grant (1995) for projects in the Susquehanna and Potomac River basins. High school students were also trained to track physical, biological, and chemical parameters in the Conococheague Creek watershed.
- The Dennis Creek Project was a joint federal, state, county and local partnership effort to restore the watershed and curb nonpoint source pollution from agricultural practices. Restoration practices included streambank fencing, wetland replacement, streamside buffers, and nutrient management for farms. A citizen's stream monitoring program was also put in place to track stream restoration progress. The main contact agencies were the Franklin County CD, DEP, PA Game Commission, NRCS, and U.S. Fish and Wildlife Service (USFWS). Funding was from the State Conservation Commission, USFWS and NRCS. A video was developed to illustrate how cooperative efforts can restore a stream suffering from nonpoint source pollution. Dennis Creek was determined to be unimpaired under the Department's unassessed waters assessment protocol.

PENNVEST:

- \$147,100 loan to Metal Township (1996) in the northern tail of the subbasin to design a sewer collection system to eliminate malfunctioning on-lot septic systems.
- \$2,614,690 loan to Washington Township (1995) to construct a pumping station, extend sewer collection system, and increase wastewater treatment capacity from 1 million gpd to 1.6 million gpd.
- Sewage facility operating, enforcement and planning grants were awarded from 1995 to 1996 to Chambersburg Borough and Metal, Quincy, and St. Thomas Townships.

Act 167 Stormwater Management Plans:

- Approved: Antietam Creek
- Under development: Conococheague Creek

Public Outreach

Watershed Notebooks

DEP's website has a watershed notebook for each of its 104 State Water Plan watersheds. Each notebook provides a brief description of the watershed with supporting data and information on agency and citizen group activities. Each notebook is organized to allow networking by watershed groups and others by providing access to send and post information about projects and activities underway in the watershed. This WRAS will be posted in the watershed notebook to allow for public comment and update. The notebooks also link to the Department's Watershed Idea Exchange, an open forum to discuss watershed issues. The website is www.dep.state.pa.us. Choose Subjects/Water Management/Watershed Conservation/Watershed and Nonpoint Source Management/Watershed Notebooks.

Citizen/Conservation groups

- Falling Springs Greenway Association and Falling Spring Chapter Trout Unlimited have raised money help establish greenways along Falling Spring Branch to protect the trophy rainbow trout fishery from encroaching urbanization.
- Conococheague Audubon Society is active in area conservation issues.

Funding Needs

The total needed dollars for addressing all nonpoint source problems in the watershed is undetermined at this time and will be so until stream assessments are completed and necessary TMDLs are developed for the watershed. However, existing programs that address nonpoint source issues in the watershed will continue to move forward.

Pennsylvania has developed a Unified Watershed Assessment to identify priority watersheds needing restoration. Pennsylvania has worked cooperatively with agencies, organizations and the public to define watershed restoration priorities. The Commonwealth initiated a public participation process for the unified assessment and procedures for setting watershed priorities. Pennsylvania's assessment process was published in the *Pennsylvania Bulletin, DEP Update* publication and World Wide Web site. It was sent to the Department's list of watershed groups, monitoring groups, and Nonpoint Source Program mailing list. Department staff engaged in a significant outreach effort which included 23 additional events to solicit public comment. The Department received 23 written comments from a variety of agencies, conservation districts and watershed groups. Pennsylvania is committed to expanding and improving this process in the future.

After development of the initial WRAS a public participation process will take place to incorporate public input into expanding and "fine tuning" the WRAS for direction on use of 319 grant funds beyond FY2000.

References/Sources of information

- State Water Plan, Subbasin 13, Potomac River. Department of Environmental Protection, June 1979
- USGS Topographic Maps
- 319 project proposals and summaries
- DEP: Watershed Notebooks, Unified Assessment Document, and information from files and databases.
- Map of Draft Level III and IV Ecoregions of Pennsylvania and the Blue Ridge Mountains, Ridge and Valley, and Central Appalachians of EPA Regions III

Streams in Subbasin 13C: 303d/305b Listings

Stream	Stream Code	Drainage area square miles	Miles Impaired	Miles Attained	Causes/Sources
2-Conococheague Creek	59346	503	2.99 3.05 3.37 13.14	251.52	Organic enrichment/low DO from Urban runoff/storm sewers Taste & odor, flow alterations, oil & grease from Land development Siltation, nutrients from Land development & AG/grazing Siltation & nutrients from AG/crops
3-Birch Run	60290	8.17		9.06	<i>HQ-CWF</i>
4-Long Pine Run	60285	2.58		5.13	<i>HQ-CWF</i>
4-Hosack Run	60278	2.92		5.53	<i>HQ-CWF</i>
3-Rocky Mountain Creek & UNTs	60247	18.4		30.9	<i>HQ-CWF</i>
4-Raccoon Creek	60271	4.02			<i>HQ-CWF</i>
4-Carbaugh Run	60248	10.2			<i>EV</i>
5-Clear Run	60253	2.52		3.93	<i>EV</i>
3-Stump Run	60238	2.02			
3-Cold Spring Run	60230	2.98		5.48	<i>HQ-CWF</i>
3-Mountain Run	60209	13.2			
4-“Devil Alex Hollow”	60216	1.94		24.29	
4-Phillaman Run	60210	3.84			
3-Falling Spring Branch	60183	11.3			<i>HQ-CWF-upper basin</i>
3-Back Creek	59902	91.2	7.32	8.91	Siltation, organic enrichment/ low DO, turbidity, siltation from AG & unknown sources
45-Rocky Spring Branch	60038	17.9	21.48	1.53	Flow alteration & siltation from Habitat modification & AG/grazing
4-Dennis Creek	60002	10.9		17.31	
4-Wilson Run	59991	11.2		17.81	
4-Campbell Run	59932	10.8			
3-Muddy Run	59839	20.0	6.14		Siltation & habitat alterations, organic enrichment/low DO, noxious aquatic plants, siltation, taste & odor, habitat alterations from AG <i>HQ-CWF</i>
3-Paddy Run	59808	3.79			

3-West Branch Conococheague Creek	59398	199			
4Dry Run	59687	15.0			
4-Township Run	59587	2.52			<i>HQ-CWF</i>
4-Broad Run	59570	6.69			<i>HQ-CWF</i>
4-Buck Run	59536	11.5			<i>HQ-CWF</i>
4-Johnston Run	59515	8.49			
4-Licking Creek	59425	34.1			
5-Blue Spring Creek	59458	4.48			
4-Welsh Run	59418	3.70			
2-Antietam Creek	59223	113		1.0	
3-East Branch Antietam Creek	59291	51.9	1.95	5.48	Chlorine & nutrients from Municipal PT source Nutrients & flow alterations from Urban runoff/storm sewers & AG/crops Nutrients & siltation from AG/grazing <i>HQ-CWF-upper basin</i>
4-Tumbling Run	59332	2.16			<i>HQ-CWF</i>
4-Vineyard Run	59327	2.21			<i>HQ-CWF</i>
4-Biesecker Run	59320	3.64			
4-Red Run at Waynesboro	59598	1.23	3.54	4.11	Nutrients & flow alterations from Small residential runoff & municipal PT source
5-Falls Creek	59304	5.10	1.02		Flow alteration & nutrients from Municipal PT source & small residential runoff
3-West Branch Antietam Creek	59258	41.4			
4-Red Run at Mont Alto	59287	16.3			
3-Marsh Run	59224	18.7			

Streams are listed in order from upstream to downstream. A stream with the number 2 is a tributary to a number 1 stream, 3's are tributaries to 2's, etc. Potomac River=1

Classification in Chapter 93: HQ= high Quality, CWF= Cold Water Fishes, EV= Exceptional Value

AG= Agriculture