

Updated 9/2003

**Watershed Restoration Action Strategy (WRAS)
State Water Plan Subbasin 09C
Bald Eagle Creek Watershed
Centre and Clinton Counties**

Introduction

The 769-square mile Bald Eagle Creek watershed is located in the geographical center of the state, and includes most of central Centre County and southeastern and southwestern Clinton County. Major subwatersheds are Fishing Creek at 181 square miles, Beech Creek at 172 square miles, and Spring Creek at 144 square miles. A total of 849 streams flow for 1237 miles through the subbasin. The subbasin is part of **HUC Area 2050204**, Bald Eagle Creek, classified as Category 4 in the Unified Watershed Assessment.

Geology/Soils

The southeastern two-thirds of the subbasin is within the Ridge and Valley Ecoregion (67), Northern Limestone/Dolomite Valleys (67a), Northern Shale Ridges (67c), and Northern Dissected Ridges (67d). Ecoregion 67 is comprised of a series of narrow northeast-southwest ridges that formed as part of the Appalachian Mountains chain, and steep, narrow valleys. The steeply sloping topography can cause increased runoff and discourage infiltration to groundwater. The numerous folds in the mountains result in repetition of rock types throughout the basin, with sandstone or quartzite on the ridges, and limestone or shale in the valleys.

Ecoregion 67a, an area of rich limestone-dolomite rock, is characterized by broad, level to undulating extensively farmed fertile valleys containing some of the highest volume springs in the state. Sinkholes, underground streams and other karst features have developed and much of the drainage is subsurface. Local relief ranges from 100 to 500 feet. Where surface streams do occur, they tend to have low gradients, plentiful year-round flow, and distinctive fish assemblages. The PA Fish and Boat Commission uses water from two major springs at Benner Springs and Pleasant Gap for trout rearing facilities.

Ecoregion 67c, which includes much of the highest terrain in the subbasin, is characterized by steep forested ridges. Crest elevations range from 1,000 to 3,200 feet. The ridge forming strata are composed of folded and faulted sandstone and conglomerate of the Tuscarora, Juniata, and Bald Eagle Formations. Other less resistant shale and siltstone form hillside slopes. High gradient streams flow off the ridges into narrow valleys. Many of these streams have little buffering capacity and are subject to acidification. Soils developed from weathered residuum are typically steep, sandy and poor. The major topographic feature of Ecoregion 67c is the northeast southwest trending Bald Eagle Mountain. Bald Eagle Creek flows in the valley to the north of the mountain and exhibits a trellised drainage pattern, with no tributary streams entering from the south.

Ecoregion 67d is composed of dissected broken ridges with crest elevations ranging from 1,000 to 2,000 feet and local relief from 300 to 800 feet. The valley and hillside north of Bald Eagle Creek is in this Ecoregion. The rocks are comprised of red to brown shale and sandstone of the Catskill Formation, gray to olive shale and sandstone of the "Marine Beds", gray sandstone and conglomerate of the Pocono Group. The strata are highly folded and faulted. This section is mainly forested except for the valley along Bald Eagle Creek.

The remainder of the subbasin (Beech Creek watershed) is in the Central Appalachians Ecoregion (69), Forested Hills and Mountains (69a) and Uplands and Valleys of Mixed Land Use (69b), also known as the Allegheny Plateau. The Allegheny Front, whose foothills lie northwest of Bald Eagle Creek valley,

separates Ecoregion 69 from the Ridge and Valley (Ecoregion 67). Ecoregion 69a includes lower Beech Creek and the northern half of Marsh Creek watersheds. Rock strata include red shale and brown to greenish gray sandstone of the Mauch Chunk Formation. This is the highest and most rugged part of the Central Appalachians. Steep forested hills and mountains characterize this section; crest elevations range up to 2600 feet.

Ecoregion 69b includes upper Beech Creek watershed upstream of Big Run. This area is underlain by coal bearing strata of the Allegheny and Pottsville Groups. This section can be characterized as a dissected upland plateau of rounded hills and low ridges, with a mosaic of woodland, agriculture and coal mines. Strata are nearly horizontal. Soils of low to moderate fertility have weathered from the bedrock.

Land Use

Subbasin 09C is an area of contrasts. Land use is a mix of forested hills and ridges, agricultural valleys with rich limestone soils, abandoned surface mines and urbanized areas. Bald Eagle and Nittany Mountains and the Beech Creek watershed in the Allegheny Plateau and are heavily forested with little development.

The population of the subbasin was 118,048 in 1990 and is projected to increase to 139,775 by 2040. The major urban area is the borough of State College; other smaller urbanized areas are Bellefonte, Milesburg, Port Matilda, Beech Creek, Mill Hall and Logantown boroughs. The majority of the development is located along the US Route 220 corridor, which traverses the subbasin at the base of Bald Eagle Mountain, along US Route 322 which crosses from east west through State College. I-80 that crosses the remote northern part subbasin from east to west has a truck stop and motels near one of the exits. State College is unusual in that the development centered around and out of Penn State University instead of along a major river corridor, as most other highly urbanized areas in Pennsylvania.

Agriculture is an important land use in the subbasin. The fertile limestone valleys of Spring Creek and Fishing Creek contain numerous farms with dairy herds and row crops. One-third of the Spring Creek watershed is agricultural. Other farms are located in the valleys along Bald Eagle Creek and lower Beech Creek. The majority of the agricultural use in main stem Bald Eagle Creek watershed is pasture.

All the surface coal mines in the subbasin are located in upper Beech Creek watershed. Several quarries remove high quality limestone in the valley near Bellefonte and Pleasant Gap.

Natural/Recreational Resources:

- Bald Eagle State Park, with the 1,730-acre flood control and recreational impoundment Joseph Foster Sayers Dam operated by the US Army Corps of Engineers.
- Part of Bald Eagle State Forest, southeast of State College.
- State Game Lands 176, southwest of State College and State Game Lands 103 south of Snow Shoe.

PA Fish and Boat Commission Class A trout waters (highest biomass category):

Highly alkaline spring creeks:

- Spring Creek, brown trout
- Logan Branch, brown trout
- Buffalo Run, brown trout
- Nittany Creek, brown trout
- Lick Run, brown trout
- Fishing Creek, brook and brown trout
- Unnamed tributary #3 to Thompson Run (near Lemont), brown trout
- Cedar Run (near Lamar), brown trout

Low alkalinity freestone streams:

- Laurel Run (at Julian), brook and brown trout
- Wallace Run, brook and brown trout
- Galbraith Gap, brook trout
- Swamp Branch, brook trout
- Bear Run, brook trout
- Little Fishing Creek, brook trout

Fisherman's Paradise on Spring Creek, a world famous brown trout fishing area, is the best known and the most heavily fished of the Class A waters in the subbasin. Spring Creek brings in fishermen from throughout Pennsylvania and the eastern US and contributes a significant amount of money to the local economy.

Chapter 93 High Quality (HQ) and Exceptional Value Streams (EV):

(EV):

- Laurel Run at Julian, source to Wallace Run
- Wallace Run, source to and including the unnamed tributary at Gum Stump
- Rock Run
- Panther Run
- Two Rock Run
- Hayes Run
- Middle Branch Big Run
- East Branch Big Run (part)
- West Branch Big Run (part)
- Cherry Run near Tylersville
- Roaring Run.

HQ:

- Spring Creek, main stem, source to PA Route 550
- Gailbraith Run
- Markles Gap Run
- McBrides Run
- Slab Cabin Run, source to PA Route 26 at River Mile 9.0
- Buffalo Run, source to T-942 at River Mile 0.66
- Lick Run, source to and including East and West Branches
- Stinktown Run
- Monument Run
- Fishing Creek, basin, source to and including Long Run, EXCEPT Cherry Run and Roaring Run, which are EV
- Harveys Run, source to Castanea Water Intake

Water Quality Impairment

Several categories of impairment are listed for the subbasin on the 303d list:

- Metals and low pH from abandoned mine drainage in Beech Creek watershed. Many discharges have high concentrations of aluminum.
- Nutrient enrichment and siltation from agriculture in Fishing Creek watershed.
- Industrial discharges: Pesticides in Bald Eagle Creek and fish consumption advisories due to the pesticides Mirex or PCB in Spring Creek watershed. Pesticides have degraded the groundwater and springs that feed Slab Cabin Run and two of the famous Class A trout streams, Logan Branch and Spring Creek. The pesticides Kepone and Mirex, which were produced at a chemical plant near

Spring Creek, contaminated the groundwater due to inadequate treatment facilities. The pesticides then moved through the groundwater to Spring Creek and tributaries and into sediments and fish flesh. The chemical plant is an EPA Superfund Site.

Spring Creek is also degraded by pesticides, fertilizers, nutrients, heavy metals and other chemicals that run off lawns, public parks, golf courses, and parking lots. Lead, PCBs, heavy metals, gasoline, fuel oil, kerosene, zinc, and sulfuric acid have also reached the creek from point and nonpoint sources. Much of the original riparian corridor has been removed through the urbanized sections.

Monitoring/Evaluation

The Bald Eagle Creek watershed is unimpaired from its headwaters downstream to the confluence of Spring Creek. Seventy-four percent of the watershed had been assessed under the unassessed waters program by the end of 1999. The portion of the watershed from below Spring Creek to the confluence of Marsh Creek is also unimpaired. A total of 140.8 of the 921.3 miles assessed (15%) were determined to be impaired.

The majority of the impairment is in the Beech Creek and Spring Creek portions of the subbasin. Twenty-six miles of main stem Beech Creek and many miles of tributaries are impaired by abandoned mine drainage. Most of the discharges are highly acidic and have elevated concentrations of aluminum. The watersheds of fourteen tributaries are unimpaired; several of these are designated as Exceptional Value.

The lower main stems of Fishing Creek and Little Fishing Creek are impaired by siltation, mainly from agriculture, although urban runoff and on-site wastewater also contributes to impairment of the main stem. The remainder of the Fishing Creek watershed is unimpaired and is classified as either high quality or exceptional value waters. A small portion of main stem Marsh Creek and half of Little Marsh Creek are impaired by siltation from grazing.

DEP biologists use a modification of U.S. Environmental Protection Agency's (U.S. EPA) Rapid Bioassessment Protocol II (RBP-II) as the primary mechanism to assess Pennsylvania's unassessed waters. This method requires selecting stream sites that would reflect impacts from surrounding land uses that are representative of the stream segment being assessed. The biologist selects as many sites as necessary to establish an accurate assessment for a stream segment. The length of the stream segment assessed can vary between sites. Several factors are used to determine site location and how long a segment can be, including distinct changes in stream characteristics, surface geology, riparian land use, and the pollutant causing impairment. A biological assessment is conducted at each site, using the modified RBP II method. Biological surveys include kick screen sampling of benthic macroinvertebrates, which are identified to family in the field, and habitat surveys.

The Spring Creek Corridor Management Plan was developed by the Centre Regional Planning Agency. Many of the policies and actions recommended were incorporated into the 1999 update of the Centre Region Comprehensive Plan, which placed emphasis on the importance of stream corridors to the future of the region. The plan encouraged streambank restoration, riparian buffers, and stormwater management.

Extensive studies are underway by state and county agencies, conservancies, Penn State University and others to develop a comprehensive plan to control stormwater and protect the groundwater in Spring Creek watershed. A technical advisory committee and a watershed plan advisory committee meets regularly to discuss stormwater issues and plans.

Future threats to water quality

Threats from the expanding urban areas should increase the severity of stormwater runoff, streambank erosion and groundwater pollution in the karst region of the subbasin. The US 322 and the completion of I-99 to replace US 220 as the major NE-SW access route will result in easier access to State College and should increase development pressures farther out from State College. Increased paving and water withdrawals will further reduce base flow to streams. The State College region has recognized this threat and has begun an effort to curb urban runoff. The Centre County Commissioners and the Clearwater Conservancy have been active in the preservation and restoration of Spring Creek.

Restoration Initiatives

Pennsylvania Growing Greener Grants:

- \$3,500 FY 2003 to Centre County Conservation District for monitoring equipment for the Centre County Pennsylvania Senior Environment Corps (PASEC).
- \$150,000 FY 2003 to Clear Water Conservancy of Central Pennsylvania to establish a comprehensive riparian conservation program for the Spring Creek Watershed.
- FY 2003 Pennsylvania State University:
 - \$70,000 for development of the Halfmoon Creek restoration plan
 - \$75,000 for the study, design and permitting of a wetland treatment on Slab Cabin Run and Spring Creek
 - \$25,000 to test Impervious Surface Area (ISA) mapping in the Spring Creek Watershed
 - \$34,905 to prepare the Spring Creek water budget.
- \$100,000 (FY2002) to State College Borough for detention basin improvements along Westerly Parkway.
- \$10,000 (FY2002) to University Area Joint Authority for riparian tree plantings along Spring Creek.
- \$50,000 (FY2002) to Pennsylvania State University for development of the Spring Creek water budget.
- \$25,000 (FY2002) to Headwaters Charitable Trust for wetlands monitoring and maintenance at the Rockview Cannery.
- \$92,672 (FY 2002) to Beech Creek Watershed association for a restoration and assessment plan to address problems from abandoned coal mines in Beech Creek watershed.
- \$242,933 (FY2001) to the University Area Joint Authority for implementation of the Spring Creek watershed assessment plan.
- \$20,000 (FY2001) to Bellefonte Borough for development of a master plan for Bellefonte Waterfront District.
- \$114,416 (FY2001) to the ClearWater Conservancy of Central Pa: for their outreach and watershed education initiative.
- \$15,500 (2001) to the Lloyd Wilson Chapter of Trout Unlimited for stream monitoring in the Sayers Lake watershed.
- \$71,490 (FY2000) to the Centre County Historical Society to address several stormwater problems within the Thompson Run watershed that emanate largely from the increased volumes of runoff from new development and paved parking areas. Funding will also provide for an upgrade of the Centre Furnace historical site. Recommended water quality improvements that will be implemented through this grant are retrofitting an existing first flush storm water management pond into a water quality basin for a 5.4-acre impervious drainage area, stabilization of the drainage way below the pond outfall as a meandering swale, and reducing nuisance runoff and flooding.
- \$80,000 (2000) to Pennsylvania State University. The Penn State University Office of Sponsored Programs (Hamer Center) will create a sustainable development site plan for the university-owned 179-acre Circleville Farm. A model plan will be created to implement the 21st Century Report recommendations, including innovative and sound land use practices, creating sustainable

communities, preventing non-point source pollution and protecting high quality, unpolluted ground and surface waters and diverse aquatic ecosystems.

- \$3,500 (2000) to the State College Area School District to provide bus transportation to stream sites and equipment to conduct water quality tests for 25 classes (over 600 children) of 5th grade students, which will give the students an opportunity for a true field experience at a stream and gain an understanding of their environment.
- \$4,000 (2000) to the Centre County Conservation District to produce an environmental issue update on the 1991 report entitled "State of the Environment: Center County." The funding will cover publication and distribution costs.
- \$31,325 (2000) to the Clearwater Conservancy of Central PA and The Spring Creek Watershed Community to partner with the USGS in creating seven groundwater monitoring wells in order to add a groundwater monitoring component to their comprehensive surface water/storm water monitoring network. The watershed is unique in that 86% of the total annual stream flow is groundwater before it enters surface streams.
- \$40,000 (2000) to Pennsylvania State University to develop and promote improved dewatering control devices for sedimentation basins as required by the Department's Chapter 102 regulations. This improvement in sediment control from earth-disturbing activities has the potential to control soil losses from hundreds of acres of land being developed in the Spring Creek watershed.
- \$90,000 (2000) to the Beech Creek Watershed Association for a detailed assessment and development of ready-to-implement passive treatment restoration designs for Contrary Run and Tributary "K", two headwater watersheds severely impacted by abandoned mine drainage.
- \$100,000 (1999) to Spring Creek Watershed Community, Clearwater Conservancy, and Trout Unlimited to complete the FGM study of lower Spring Creek begun with a 319 grant.
- \$300,000 (1999) to the Beech Creek Watershed Association to start remediation of degradation from abandoned mine drainage and road construction. This project will address discharges and revegetation of a large spoil pile remaining from construction of I-80 which degrade the water quality of Jonathan Run.
- \$152,300 (1999) to Penn State University to install porous pavement at the Centre County Visitation Center parking lot to demonstrate a way to control urban runoff in a Karst area. Construction and maintenance techniques will be evaluated.
- \$40,000 (1999) to the Clearwater Conservancy of Central Pennsylvania to develop a Spring Creek website to increase awareness of watershed issues and an understanding of watershed hydrogeology. Maps and cross-section diagrams will be linked to provide illustrations of the concepts and locations information within the watershed.
- \$62,000 (1999) to the Clearwater Conservancy of Central Pennsylvania to provide community outreach and education through the use of GIS in support of Vision 2000: Living with I-99. The GIS will include mapping of watershed features and modeling of potential impacts under alternative development scenarios.
- \$52,290 (1999) to the Clearwater Conservancy of Central Pennsylvania to complete phase II of the Spring Creek watershed monitoring project, which will establish a stormwater monitoring system to assess nonpoint source pollution over time and to perform geomorphologic studies on eight tributary sites within the watershed.
- \$60,000 (1999) to the Lloyd Wilson Chapter of Trout Unlimited to conduct an in-depth watershed assessment of Foster Joseph Sayers Lake to control nonpoint sources of pollution. A management plan will be developed for the implementation of BMPs.
- \$89,500 (1999) to Spring Township and the Spring Creek Chapter of Trout Unlimited to install innovative stormwater management practices, create 5 acres of forested riparian buffer, establish or enhance 5 acres of native grass and native wildflower meadow and distribute educational sign for park visitors. On-site workshops will be held and educational materials promoting environmentally sensitive land management strategies will be distributed.

US EPA Clean Water Act Section 319 Grants:

- \$200,000 (FY2001) to Clinton County Conservation District to assist landowners in the Fishing Creek watershed with costs of installing agricultural BMPs to reduce soil and nutrient loading to streams.
- \$200,000 (FY2000) to Clearwater Conservancy for restoration of stream channels and riparian buffers and establishment of an interpretive visitor center on upper Spring Creek at the Pennsylvania Military Museum at Boalsburg.
- \$96,000 (FY2000) to Trout Unlimited for restoration of lower Spring Creek. The project will include an FGM stream assessment on Spring Creek on the 1,750 feet of stream frontage and enhancement of forested riparian buffers at the demonstration site in Spring Township. The Township will develop the site as a conservation park for educational tours and workshops.
- \$74,971 (FY99) to Centre County Commissions for modeling and monitoring to determine and make recommendations on potential BMP's for treatment of stormwater runoff for benefits to water quality.
- \$122,900 (FY93) to Centre County for streambank fencing on Spring Creek.

Pennsylvania Watershed Restoration Assistance Program (WRAP) Grants:

- \$27,400 (FY99) grant for to the Clinton County Conservation District to help the newly formed Beech Creek Watershed Restoration and Preservation Association to further define acid mine impairment problems and identify and prioritize impaired stream segments for remediation and restoration leading to the development of a management plan.

DEP Bureau of Mining and Reclamation (BMR):

- Remining permit to Sky Haven Coal Co. to improve water quality of Sandy Run. Sky Haven will build 4 limestone trenches (ALD's) on pre-existing acid discharges in the permit area. Mining on the 158-acre site will also improve water quality through the addition of 500 tons of limestone per acre to the backfill.

DEP Bureau of Abandoned Mine Reclamation (BAMR):

- BAMR plans to install a large SAPS at the Avery Coal Co. bond forfeiture site on Big Run in Clinton County in 2000.

DCNR Rivers Conservation Grant:

- Clearwater Conservancy for Phase II of the Spring Creek Corridor Study which will focus on Spring Creek tributaries. Study being conducted by Penn State University Department of Landscape Architecture. Phase I was completed for main stem Spring Creek.

EPA Wetlands Protection Grant:

- \$71,573 to the Centre Region Council of Governments to help develop a wetlands protection program for the Millbrook Marsh Nature Center. The Millbrook Marsh Nature Center was established as part of the restoration of the 50-acre marsh complex along a tributary to Spring Creek that is surrounded by urban development and roads.

Chesapeake Bay Program:

- \$66,000 (FY1998) to Clinton County CD for installation of agricultural BMPs. A total of \$473,632 has been awarded to Clinton County CD from 1994 to 1998. The program can provide up to 80% cost-share funding, up to a maximum \$30,000 for BMPs such as manure storage facilities, waterways, diversions, heavy use area protection, and roof runoff management. The farm that receives funding also agrees to implement a nutrient management plan.

US Natural Resource Conservation Service PL-566 Studies:

- Cedar Run, near Julian, for stormwater management.

Stormwater Management Act 167 Plans:

- Clinton County developed a watershed stormwater management plan for Fishing Creek and Cedar Run.
- The Spring Creek Watershed Commission developed a plan for Spring Creek.

Water Supply/Wastewater Programs:

- Community Block Grants:

- \$425,911 to Centre County to construct a water storage tank to serve customers of Snow Shoe Township, to improve the sanitary sewer system in Spring Township by extending the line to moderate and low income families, and to improve the sanitary sewer system in Port Matilda Borough by improving the well field and distribution system (1996).
- \$152,336 to Bellefonte Borough to install a new water line, pumping station, and sidewalks in Halfmoon Borough (1996).
- Pennvest Loans:
 - The Spring-Benner-Walker Joint Authority completed a \$4.6 million project to help protect Spring Creek from failing home septic systems in April 2001. Parts of the lower Spring Creek watershed from Fisherman's Paradise to Bellefonte Borough had a high incidence of failing on-lot septic systems and some homes piped sewage directly into the stream. The new lines will collect about 60,000 gallons per day of sewage that will be transported to the Bellefonte Borough treatment plant. The Authority worked with several groups to ensure that the project was completed with as little disturbance to the environment as possible.

PENNDOT Transportation Enhancement Act Program Grants:

- \$1.5 grant application by the Beech Creek Watershed Association to mitigate AMD to Johnathan Run. The drainage comes from a large highway fill area near Snow Shoe in Centre County which was created by the construction of I-80, 30 years ago. The rock fill contains large amounts of iron and acid bearing materials. Partners in this project are PA Fish and Boat Commission, USDA, Canaan Valley Institute, and the DEP Hawk Run District Mining Office.

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

- The Clearwater Conservancy, a private conservation agency which promotes a balance between growth and natural resource protection was formed in 1980. The Conservancy sponsored several studies, including the Natural Heritage Inventory and the Spring Creek Corridor Study with assistance from the Western Pennsylvania Conservancy and Penn State University Department of Landscape Architecture. A comprehensive watershed initiative is underway involving education, outreach and NPS issues.
- Spring Creek Watershed Commission was formed in November 1996 by the Centre County Commissioners to develop a plan to protect and enhance the water quality of the county. The Commission includes one elected official from each of the county's 4 boroughs and 10 townships. The commission completed Phase I of their initiative, development of the Spring Creek Watershed Stormwater Management Plan. The plan was the first in the state to place equal emphasis on both water quality and quantity. The commission supported a request from Benner and College Townships to conduct a special study of the Shiloh Road drainage area, the location of most of the development in the Dale Summit area. The commission approved development of grant applications to create a plan for the Nittany and Bald Eagle Valleys Greenway, which will stretch from the headwaters of Spring Creek to Bald Eagle State Park. They received a DCNR grant and purchased 3,000 acres of land.

- Spring Creek Watershed Community, a grassroots group with 2100 members has sponsored litter and trash clean-up days by local citizen with support of businesses, agencies and environmental groups. A major initiative was the establishment of the Water Resources Monitoring Project in April 1999. This project will provide a description of the quantity and quality of surface waters and allow for relatively early detection and assessment of impairments. They are conducting a comprehensive assessment dealing with nonpoint source issues and construction of the new I-99 highway. A newsletter called Springs and Sinks is published monthly. Their website is <http://www.springcreekwatershed.org/>.
- I-99 Partnership for Sustainable Development is devoted to assisting communities affected by I-99 with developing a sustainable land use plan. The first step has been for the 6 affected municipalities to create a set of overlay ordinances for the 12 interchanges to be constructed in Centre County.
- Beech Creek Watershed Restoration and Preservation Association formed in spring 1999. They have started gathering information for an assessment and restoration plan. The plan was developed by Gannett Fleming and funded through a PA WRAP grant.
- Alliance for the Chesapeake Bay is active in restoration of streamside buffers.
- Spring Creek Chapter Trout Unlimited has been involved in protecting the trout fisheries of the area and securing grants for stream improvement projects.
- The Lloyd Wilson Chapter Trout Unlimited has interests in the restoration of Beech Creek watershed.

The DEP Northcentral Region's pilot watershed project area is Spring Creek. The project's goal is to develop a regional office interdisciplinary watershed approach to identify problems and develop strategies for resolution. Included are representatives of each regional office program, district mining program, Centre County CD, Clearwater Conservancy, Spring Creek Watershed Community, and Penn State Center for Watershed Stewardship.

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.

Recommendations/Restoration Strategies

Although Subbasin 09C was not a priority watershed under the Unified Assessment, the watershed was selected as a priority Watershed Restoration Action Strategy watershed because of the interest in the

subbasin and the number of restoration activities and programs underway, especially in the Beech Creek and Spring Creek watersheds.

The subbasin is large and could be divided into 4 parts for restoration strategies:

- Spring Creek, a mix of urban/stormwater management and agriculture related problems
 - Restoration needs: Urban runoff controls in State College area.
- Marsh Creek
 - Agricultural BMPs: On a small portion of lower main stem and portions of upper main stem of Little Marsh Creek and nine unnamed tributaries.
- Beech Creek, abandoned mine drainage pollution
 - AMD: The entire main stem is impaired; however, the extent of the problems will make it difficult to restore the main stem; treatment should be concentrated on selected tributaries such as North Fork Beech Creek, Cherry Run, South Fork Beech Creek, Jonathan Run, and Big Run.
- Fishing Creek, agricultural problems and urban runoff/storm sewers
 - Urban runoff: 1.69 miles affected
 - Agriculture: 9.73 miles affected in main stem Fishing Creek; 3.04 miles affected on Little Fishing Creek.

References/Sources of information

- State Water Plan Subbasin 9, Central West Branch Susquehanna River. Department of Environmental Protection, February 1980
- 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 09C: 303d/305b Listings

Stream	Stream Code	Drainage area square miles	Miles Impaired	Miles Attained	Causes/Sources/ Comments
3-Bald Eagle Creek & 47 UNTs	22412	770		76.21	
4-“Big Hollow” & 2 UNTs	23242			2.83	
4-“Fowler Hollow” & 5 UNTs	23236	2.64		5.36	
4-“Blue Springs Hollow”	23223	0.36		1.03	
4-“Bell Hollow” & 9 UNTs	23226	5.51		11.28	
4-“Reese Hollow” & one UNT	23221	3.43		4.67	
4-Laurel Run at Port Matilda & 5 UNTs	23210	9.38		9.56	
5-Oliver Run & 2 UNTs	23212	2.90		4.42	
4-“Sunnyside Hollow” & 2 UNTs	23205	4.19		5.92	
5-“Wills Hollow”	23208	0.62		1.26	
4-“Williams Hollow”	23202	0.59		1.32	
4-“Arderly Hollow” & one UNT	23200	1.52		2.75	
4-“Steel Hollow” & 4 UNTs	23194	4.08		6.84	
5-“McDonald Hollow”	23199	0.85		1.47	
4-Mudlick Run & 5 UNTs	23187	2.15		4.84	
4-Laurel Run at Julian & 8 UNTs	23171	7.37		11.54	<i>EV; Class A brook & brown trout</i>
5-Whetstone Run & one UNT	23179	1.25		2.43	<i>EV</i>
4-Dicks Run & 12 UNTs	23149	8.70		16.01	
4-Dewitt Run & 4 UNTs	23144	4.37		6.64	
4-“Bush Hollow” & 8 UNTs	23133	5.21		9.99	

4-"Brower Hollow" & 4 UNTs	23127	2.08		4.64	
4-Wallace Run & 22 UNTs	23093	23.0		32.38	<i>EV upper basin; Class A brook and brown trout, middle 2.0 miles</i>
5-"Dry Hollow"	23120	1.01		1.76	<i>EV</i>
5-Rock Cabin Run & one UNT	23118	0.73		1.05	<i>EV</i>
5-Birch Lick Run	23115	0.59		1.03	<i>EV</i>
5-North Branch Wallace Run & 2 UNTs	23112	2.20		2.91	<i>EV</i>
4-Moose Run	23090	2.27			
4- Spring Creek	22966	144	<u>18.24</u>		<u>Fish consumption advisory: from Industrial point source, Pesticides</u> <i>HQ-CWF, upper main stem; Class A brown trout, entire stream</i>
5-Galbraith Gap Run	23075	5.14			<i>HQ-CWF; Class A brook trout</i>
5-Cedar Run at Oak Hall	23059	17.5		4.17, one UNT	
5-"Markles Gap Run"					<i>HQ-CWF</i>
5-"McBrides Run"					<i>HQ-CWF</i>
5-Slab Cabin Run	23036	21.5	<u>4.48</u>		<u>Fish consumption advisory from Industrial point source, Pesticides</u> <i>HQ-CWF, upper basin</i>
6-Roaring Run near Shingletown	23042	4.69			
5-"Big Hollow"	23015	17.0			
5-Logan Branch	22997	20.8	1.46 <u>2.16</u>	3.12	Metals from MUNI <u>Fish consumption advisory, Industrial point source, Priority organics</u> <i>Class A brown trout, middle 1.6 miles</i>
5-Buffalo Run	22972	27.3			<i>HQ-CWF, upper basin; Class A brown trout, entire stream</i>
4-"Holt Hollow"	22954	4.04			
4-Nittany Creek	22928	20.0		7.43	<i>Class A brown trout</i>
4-Antis Run & 6 UNTs	22921	2.10		6.35	
4-Bullit Run & 6 UNTs	22905	6.09		9.56	
5-Stone Run	22912	0.34		0.94	

5-"Smith Hollow	22910	0.25		0.8	
5-"Beaty Hollow"	22909	0.12		0.49	
5-"Dopps Hollow"	22908	0.24		0.7	
4-Greens Run & 2 UNTs	22897	2.00		4.61	
5-"Canoe Hollow"	22901	0.20		0.54	
"Betz Hollow"	22900	0.23		0.57	
4-Lick Run	22872	12.4		5.62	<i>HQ-CWF, upper basin; Class A brown trout, entire stream</i>
5-"East Branch"					<i>HQ-CWF</i>
5-"West Branch"					<i>HQ-CWF</i>
4-Hunters Run & 7 UNTs	22829	2.52		7.3	
4-Marsh Creek	22800	44.4	0.37 main stem	17.03 main stem; 26.55, 33 UNTs	Siltation from AG grazing
5-Laurel Run & one UNT	22860	1.28		2.2	
5-Little Marsh Creek	22830	13.7	4.19 main stem; 10.92, 9 UNTs	4.09 main stem; 3.35, 7 UNTs	Siltation from AG-grazing & removal of vegetation
5-"Tar Kill Hollow"	22829	0.36		0.74	
5-Romola Branch & 4 UNTs	22817	5.05		7.98	
6-Bartley Run	22821	0.98		1.56	
5-Big Run near Blanchard & 3 UNTs	22809	2.51		5.66	
4-Beech Creek	22596	172	27.51 main stem; 2.95, 6 UNTs	12.85, 19 UNTs	Metals & low pH from AMD
5-North Fork Beech Creek	22781	20.8	7.63 main stem; 5.16, 7 UNTs; 1.55, 2 UNTs	2.0, 3 UNTs;	Metals & low pH from AMD; Nutrients from On-site wastewater
6-Cherry Run at Clarence	22796	2.28	0.89		Metals & low pH from AMD
6-Little Sandy Run	22791	5.75	2.02 main stem	2.97 main stem; 3.78, 3 UNTs	Metals & low pH from AMD
5-South Fork Beech Creek	22763	18.5	4.63 main stem; 1.66, 2 UNTs	8.31 main stem; 6.18, 8 UNTs	Metals & low pH from AMD
6-"Brushy Hollow"	22780	0.41		0.65	

6-Stinktown Run & 3 UNTs	22771	2.31		3.74	<i>HQ-CWF</i>
6-Horsehead Run	22770	1.19		1.22	
6-Jonathan Run	22767	1.31		1.65	Metals & low pH from AMD
5-Rock Run & One UNT	22760	1.40		3.14	<i>EV</i>
5-Sandy Run	22742	13.1	3.01 main stem; 5.22, 7 UNTs	5.82 main stem; 1.35, 2 UNTs	Metals & low pH from AMD
6-Contrary Run	22755	1.04		0.55	
6-Beauty Run	22750	3.33	0.36 main stem	2.75 main stem; 2.91 3 UNTs	Metals & low pH from AMD
5-Wolf Run & 7 UNTs	22731	8.92		13.65	<i>EV</i>
6-Little Wolf Run & one UNT	22732	1.24		2.19	<i>EV</i>
5-Panther Run & 8 UNTs	22717	6.84		15.08	<i>EV</i>
5-Eddy Lick Run & 10 UNTs	22703	10.2		15.71	
6-“Fetzer Hollow” & one UNT	22706	1.16		2.74	
5-Logway Run	22701	0.58	0.81		Metals from AMD
5-Council Run	22691	6.05	1.91 main stem; 0.41 one UNT	2.67 main stem; 7.34 9 UNTs	
5-Two Rock Run & one UNT	22687	3.38		4.29	<i>EV</i>
5-Three Rock Run	22686	1.50		2.05	
5-Hayes Run & 8 UNTs	22677	6.37		12.74	<i>EV</i>
5-Big Run at Orviston	22644	34.2	3.94 main stem	5.07, 5 UNTs	
6-East Branch Big Run & 3 UNTs	22670	11.2		11.28	<i>EV, upper basin</i>
7-Swamp Branch	22673	4.27		3.48	<i>EV; Class A brook trout</i>
8-Coon Run	22674	0.38		1.00	
6-Middle Branch Big Run & 5 UNTs	22662	7.23	8.99		Metals & low pH from AMD <i>EV, upper basin</i>
7-Sinking Spring Branch & one UNT	22663	0.96		1.62	
6-West Branch Big Run & 5 UNTs	22649	11.8		10.13	<i>EV</i>
7-Panther Branch & one UNT	22657	2.15		2.58	<i>EV</i>
7-“Owl Hollow”	22654	0.15		0.38	<i>EV</i>
7-Little Bear Run	22653	0.95		1.67	<i>EV</i>

7-Bear Run near Orviston & one UNT	22651	1.78		3.49	<i>EV</i>
5-Salt Lick Run & one UNT	22642	1.18		3.11	
5-“Green Hollow”	22640	0.72		1.93	
5-Monument Run & 9 UNTs	22630	4.88		11.12	<i>HQ-CWF</i>
5-Twin Run & 4 UNTS	22625	4.27		8.69	
5-Sugar Camp Run & 2 UNTs	22621	0.70		3.01	
7-“Slide Hollow”	22624	0.45		1.08	
7-“The Cove”	22620			1.25	
5-Bitner Run & 7 UNTs	22604	3.84		7.06	
5-Sugar Run & One UNT	22601	1.17		2.83	
4-Masden Run	22580	4.29			
4-Laurel Run near Beech Creek Station	22572	9.68			
5-Plunket Run	22576	1.54			
4-Fishing Creek	22416	181	1.69 main stem; 9.73 main stem; 0.13, one UNT 2.19 main stem	25.87 main stem; 48.94, 45 UNTS	Siltation from Urban runoff/ storm sewers; Nutrients & siltation from AG (crops) and onsite wastewater; Unknown source <i>HQ-CWF, upper basin;</i> <i>Class A brook and brown</i> <i>trout, 23.7 miles, upper &</i> <i>middle creek</i>
5-Eastville Run	64632			2.1	<i>HQ-CWF</i>
5-Sulphur Spring	22542				<i>HQ-CWF</i>
5-Mill Creek	22541	3.10		2.87	<i>HQ-CWF</i>
7-“Hall Hollow”	22536	0.40		0.06	<i>HQ-CWF</i>
5-Bull Run & 2 UNTs	22531	3.74		4.78	<i>HQ-CWF</i>
5-Wolf Gap Run	64546			2.7	<i>HQ-CWF</i>
5-Schrenchengast Gap Run & one UNT	64544			2.07	<i>HQ-CWF</i>
5-“Bletz Hollow” & 4 UNTs	22521	3.08		6.20	<i>HQ-CWF</i>
5-Bear Run near Tylersville	22514	3.19		3.35	<i>HQ-CWF;</i> <i>Class A brook trout</i>

5-Cherry Run near Tylersville & 5 UNTs	22508	10.6		12.4	<i>EV</i>
5-Spring Run	22506	1.27		2.10	
5-Little Fishing Creek	22483	41.9	3.04 main stem; 0.54, one UNT	12.65 main stem; 15.88, 11 UNTS	Siltation from AG (grazing) <i>HQ-CWF; Class A brook trout</i>
6-Rag Valley Run	22504	0.53		0.73	
6-Roaring Run at Lamar & 3 UNTs	22484	14.7		12.18	<i>EV, upper basin; HQ-CWF, lower basin</i>
7-Laurel Run near Madisonburg	22488	2.74		2.25	<i>HQ-CWF</i>
5-Cedar Run near Cedar Springs & 17 UNTs	22442	14.8		17.53	<i>HQ-CWF; Class A brown trout</i>
5-Long Run & 9 UNTs	22419	24.4		16.28	<i>HQ-CWF</i>
6-Washburn Run	22441	1.02		1.11	<i>HQ-CWF</i>
6-Pepper Run & 2 UNTs	22438	3.96		6.84	<i>HQ-CWF</i>
6-Cooper Run	22436	0.82		1.6	<i>HQ-CWF</i>
6-Spruce Run	22435	1.27		1.41	<i>HQ-CWF</i>
8-Chub Run & 4 UNTs	22426	8.70		6.35	<i>HQ-CWF</i>
5-“Axe Factory Hollow”	22417			1.68	
4-Harveys Run	22413	3.17			<i>HQ-CWF upper basin</i>
5-West Kammerdiner Run					

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. Susquehanna River=1, West Branch Susquehanna River=2, Bald Eagle Creek= 3, etc.

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

AG= Agriculture, AMD= Abandoned Mine Drainage, MUNI= Municipal point source discharge