

Framework for Sustainable Management of the Pocono Creek Watershed

Pocono Creek Watershed

Pocono Creek is an 18-mile-long tributary to McMichael Creek in the Brodhead Watershed. Its major tributaries include Dry Sawmill Run, Wolf Swamp Run, Scot Run, Bulgers Run, Reeders Run, Rocky Run, and Cranberry Creek. Interstate 80 and State Route 611 form a spine through the 46.5-square-mile watershed. Land use is mainly residential and also includes the commercially developed Route 611 corridor, Big Pocono State Park, Camelback Ski Area, the Nature Conservancy's Tannersville Cranberry Bog, and state gamelands. Pocono Creek is designated by the Pa. Department of Environmental Protection (DEP) as a High Quality-Exceptional Value Cold Water Stream possessing exceptionally high water resource values and suitable for the Commonwealth's anti-degradation water quality protection strategies for waters that exceed state standards. The Pa. Fish and Boat Commission classifies Pocono Creek as a Class A wild trout stream, finding significant populations of brook and brown trout.

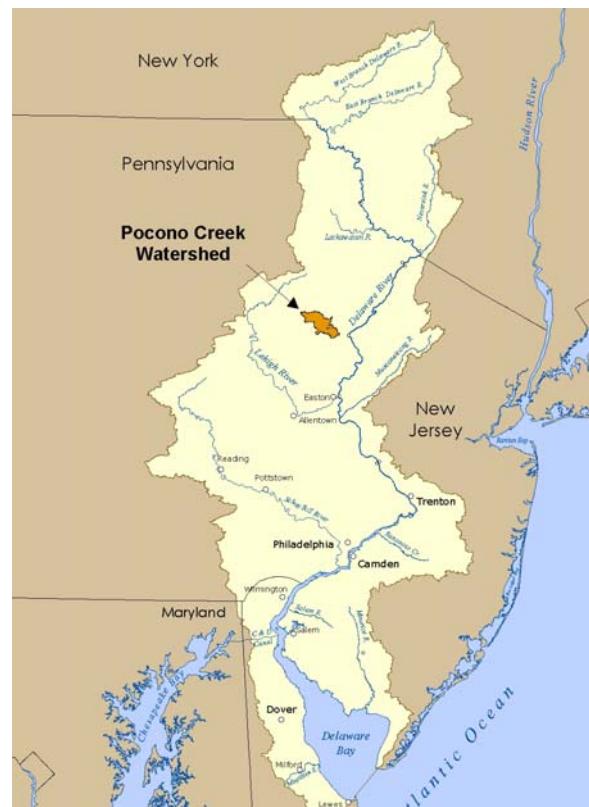
Pocono Creek Pilot Study (2000-2004) Background

There are present-day challenges to developing a cohesive watershed plan that addresses multiple land and water issues in a unified manner. Since existing regulations typically force a piecemeal approach to development of a watershed, elements like land use, water quality and quantity, and surface and groundwater are often treated separately at the expense of cost-effective, holistic solutions.

A new approach, **goal-based watershed management**, relies on active community participation. It starts with local communities setting both water resource and socioeconomic goals for their watershed.

Water resource goals holistically address desirable water quality, water quantity, fish species, habitat, and streambank conditions. Through the goal-setting process, important water resources within the watershed that should be preserved and enhanced are identified.

Socioeconomic goals address future conditions needed to support the local economy and the desired quality of life for residents. These include important economic sectors that should be preserved and strengthened, as well as community and development patterns that should be encouraged.



The Pocono Creek Watershed within the Delaware River Basin

Once the goals are established, management strategies are developed to meet them. These strategies are evaluated in terms of their costs and other socioeconomic impacts. Then, the communities select and implement the preferred approaches. Watershed protection is achieved by tailoring protection measures to meet each watershed's unique characteristics as well as the communities' priorities and needs.

The Delaware River Basin Commission (DRBC) and the Monroe County Conservation District received a Pennsylvania Growing Greener Initiative grant to study this new approach to watershed management. Other partners included the Monroe County Planning Commission, Brodhead Watershed Association, DEP, Fish and Boat Commission, Pa. Department of Transportation, U.S. Geological Survey, and Villanova University. The seven municipalities within the watershed – Hamilton, Jackson, Pocono, Stroud, Tobyhanna, and Tunkhannock Townships as well as Stroudsburg Borough – were actively involved in the project.

The Pocono Creek Watershed was an excellent area for the pilot study because of its high quality water coupled with tremendous growth. The watershed community has demonstrated its commitment to planning for the future and to environmental protection through such efforts as its exemplary county, municipal, and volunteer water quality monitoring programs. Just as important, the watershed has a tourist- and recreation-based economy that relies on the preservation of its natural resources.



Cranberry Creek, a tributary to Pocono Creek

The study identified four major water resource issues in the Pocono Creek Watershed: streamflow, water quality, stream channel stability, and aquatic ecology. It also set the following watershed goals:

- Maintain high water quality;
- Preserve stream corridors and flood plains;
- Coordinate a watershed planning process with other levels of government;
- Maintain existing streamflow;
- Develop using village centers and conservation design;
- Establish an economy compatible with the environment; and
- Preserve open space

Framework for Sustainable Watershed Management (2004-2009)

The Pocono Pilot Study identified concerns with projected development in the watershed, particularly the headwaters. Specifically, it suggested that the current permissible level of development would deplete the existing base flow, thereby hindering its ability to support a wild trout population, which is an aquatic use in the Pocono Creek. In response to these concerns, the DRBC, in partnership with the U.S. Environmental Protection Agency's Office of Research and Development (EPA-ORD), the U.S. Geological Survey (USGS) and its Fort Collins Science Center in Colorado, Monroe County Conservation District, Brodhead Watershed Association, and the Monroe County Planning Commission, have completed a watershed-based study of the effects of current and potential future land use on base flows relating specifically to trout populations.

Three Pillars for Sustainable Watershed Management

The first pillar is **Technical Analysis and Scientific Research**. This information provides the baseline for existing and future water budgets, groundwater/surface water interface, streamflow statistics, hydrologic conditions, and watershed land use. It serves to determine the necessary conditions to maintain sustainable flows in the watershed, characterizes the hydrologic relationships between base flows and withdrawals, and identifies stressors to existing habitat.

EPA-ORD developed a dynamic watershed hydrology land use model that shows the effect of land use change on recharge, which affects base flows, as well as on runoff. Most other models only show the effect of development on runoff by the percentage of impervious surface, for example. These model results were used in the USGS three-dimensional groundwater model developed to estimate the effect of base flow reduction caused by groundwater withdrawals.

USGS-Fort Collins used its Hydroecological Integrity Assessment Process (HIP) to determine the hydrologic classifications of the Pocono Creek Watershed's streams in order to better understand the relationships between streamflows and stream health.

The second pillar is **Planning**, which consists of management strategies and planning tools appropriate for retaining the hydrologic integrity of the streams and watershed. Selecting the strategies that are the most effective is based on the community's watershed goals. The Planning pillar also began the process of breaking down the barriers between the various agencies, communities, and individuals within the Pocono Creek Watershed.

The third pillar, **Education and Outreach**, laid the groundwork for a future "social marketing" effort. This led to the development of a community arts project known as *Trout Tales and Trails* (www.troutrails.org). Fifteen five-foot decorated trout statues were placed along the "Trout Trail" that ran throughout the watershed. Each trout told a piece of the "Trout Tale" that featured a tale of how a watershed's hydrologic integrity is essential to the economic stability of the region and that it is beneficial to develop "green" or "blue" development practices. *Trout Tales and Trails* won a second place award in April 2009 from the Northeastern Pennsylvania Nonprofit and Community Assistance Center in the arts and culture category. In October 2009, the project also was awarded a Northeastern Pennsylvania Environmental Partnership Award by the Pennsylvania Environmental Council.



This five-foot "Native Brookie" trout, embellished by local artist Jennifer Frantz, helps a student learn about hydrology, land use, and trout in front of the Borough of Mount Pocono municipal building.

Questions?

**Contact Pamela V'Combe, DRBC Watershed Planner
(609) 883-9500 ext. 226; Pamela.V'Combe@drbc.state.nj.us**

Visit the DRBC web site at www.drbc.net for more information.

October 2009