



# 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)

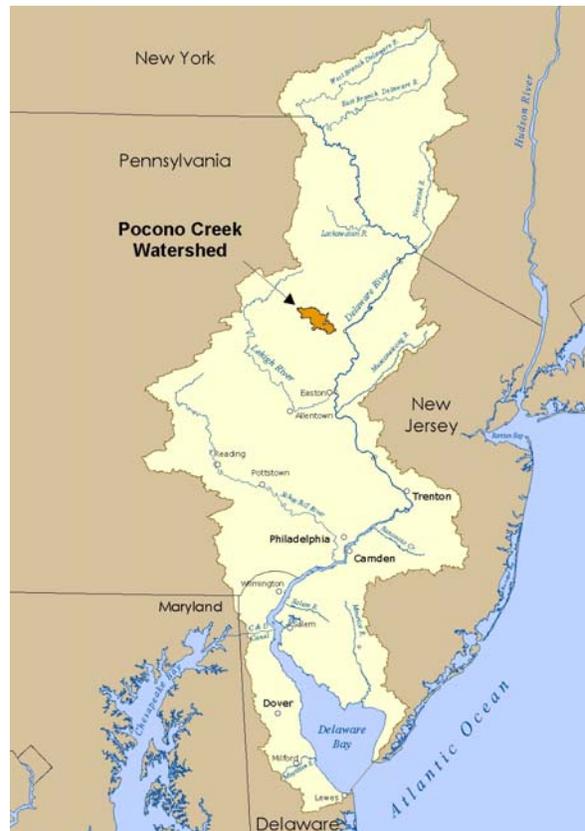
### Background

It is difficult at the present time to develop a cohesive watershed plan that addresses multiple water resource issues in a unified manner. Since existing regulations typically force a piecemeal approach to watershed management, elements like land use, water quality and quantity, and surface and ground water are often treated separately at the expense of cost-effective, innovative 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 water quality, water quantity, fish species, habitat, and streambank erosion. 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.

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 approach. 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 – also 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 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.

## **Findings**

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

## **The Next Step: Using Sound Science to Develop Management Strategies to Protect the Pocono Creek Watershed**

The Pocono Pilot Study identified concerns with overdevelopment in the watershed's headwaters. Specifically, it found that development was depleting the base flow/ecological integrity of the stream and, therefore, its ability to support a wild trout population which, according to the federal Clean Water Act, is an aquatic use parameter.

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 are in the

process of completing a watershed-based study of the effects of land use on base flows relating specifically to trout populations.

### Three Stages for Sustainable Watershed Management

The first stage is **Technical Analysis and Scientific Research**. This information provides the baseline for existing water budgets, ground water/surface water interface, streamflow statistics, hydrologic conditions, and existing water demands. 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.



Cranberry Creek, a tributary to Pocono Creek

EPA-ORD has produced a dynamic watershed hydrology land use model that shows the effect of development on recharge (which determines base flows) as well as on runoff. Most other models only show the effect of development on runoff (percentage of impervious surface, etc.). A three-dimensional ground water model is currently in development by USGS to estimate the effect of base flow reduction caused by ground water withdrawals.

Work also is underway by USGS-Fort Collins using the Hydroecological Integrity Assessment Process (HIP) to conduct hydrologic classifications of the streams in the Pocono Creek Watershed to better understand the relationships between streamflows and stream health.

The second stage will consist of **Management Strategies and Planning Tools Development** appropriate for retaining the existing integrity of the streams and selecting those strategies that are the most effective based on the community-driven watershed goals identified by the 2000-2004 pilot project.

The third stage will be **Community Outreach** involving a “social marketing” educational effort showing local officials that influencing development to protect the integrity of streams is in their best interest and that it is beneficial to develop “green” or “blue.”

#### Questions?

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*Visit the DRBC web site at [www.drbc.net](http://www.drbc.net) for more information.*

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