NONPOINT SOURCE SUCCESS STORY

Pennsylvania

Lake Wallenpaupack Improves After Best Management Practices and Outreach are Implemented to Reduce Nonpoint Source Pollution

Waterbody Improved

Excess nutrients from agricultural and road runoff impaired Lake Wallenpaupack, one of Pennsylvania's most important recreational resources. As a result, Pennsylvania Department of Environmental Protection (PADEP) added the lake to its 1996 Clean Water Act (CWA) section 303(d) list of impaired waters. Providing technical assistance and implementing best management practices (BMPs) reduced phosphorous levels and has improved water quality. As a result, PADEP removed Lake Wallenpaupack from Pennsylvania's list of impaired waters in 2016.

Problem

Beginning in 1980, an initial Phase I Diagnostic-Feasibility Study of Lake Wallenpaupack was conducted to establish water quality and identify potential sources of point source and nonpoint source pollution inputs to the lake. Based on these data, Lake Wallenpaupack was listed on the 1996 CWA section 303(d) list for nutrients, suspended solids and mercury, and was given high priority for the development of a total maximum daily load (TMDL) (Figure 1). The lake impairments are attributed to nutrients and suspended solids from agricultural runoff, and to mercury from atmospheric deposition. The TMDL was completed in 2005 and targeted total phosphorus to control algal blooms.

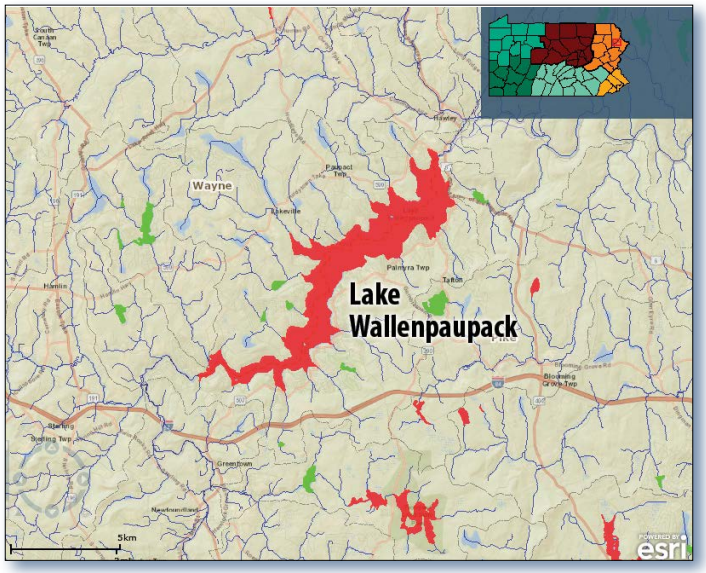

Figure 1. Lake Wallenpaupack is in eastern Pennsylvania. Red lakes represent areas not fully attaining standards; green lakes are attaining water quality standards.

Project Highlights

Lake Wallenpaupack, located in the heart of the Pocono Mountains' Lake Region, is a popular destination for boating, fishing, swimming, snowmobiling and other activities. With 52 miles of shoreline and an overall length of 13 miles, Lake Wallenpaupack boasts 5,700 acres of open water, making it the third largest lake in Pennsylvania.

Restoration began in 1987 with a Phase II Lake Restoration project at Lake Wallenpaupack for the development and implementation of a variety of BMPs in the 219-square-mile watershed. The Phase II projects were completed in 1993. In 1998 and 1999, the Lake Wallenpaupack Watershed Management District (LWWMD) received a total of $2,200,000 from two U.S. Environmental Protection Agency (EPA) grants for watershed investigations, the development of pollutant budgets for Lake Wallenpaupack, additional lake and stream water quality monitoring, public education seminars and workshops, and the design and construction of BMPs throughout the watershed to control nonpoint source pollution to Lake Wallenpaupack. Examples of BMPs installed include stormwater conveyances, shoreline revegetation and stabilization, wetland and floodplain enhancement, manure storage, and barnyard runoff mitigation. An environmental education curriculum developed for the Wallenpaupack Area School District under a separate EPA CWA section 319 grant project won the 1998 Governor's Award for Environmental Excellence in Environmental Education.

In December 2006 an updated watershed management plan, completed using the EPA grants, was presented to the LWWMD. The plan outlined existing accomplishments and made 22 recommendations for future action and priority areas. Many of the actions recommended in the plan are currently underway.

In mid-2010 LWWMD acted on a key recommendation of the 2008 Strategic Plan and created a new executive director's position. Planning for future growth of the organization and improved protection of the watershed is ongoing.

Results

Based upon trend analysis, the water quality of Lake Wallenpaupack has generally improved over the past 35 years (1980–2014). Total phosphorus concentrations in surface and bottom waters and Secchi transparency (water clarity) have gradually improved (Figure 2). These decreases in TP concentration and increase in visibility led to trophic state index (TSI) scores below 50 beginning in 2013 for both total phosphorus and Secchi depth, indicating an improvement from eutrophic to mesotrophic status. Based on these data, Lake Wallenpaupack was removed from Pennsylvania's 2016 impaired waters list. It now attains its aquatic life, recreation, and potable water designated uses.

Partners and Funding

In Setember 1979 Pike and Wayne counties and the 14 townships in the Lake Wallenpaupack Watershed formed the LWWMD. Currently the LWWMD is managed by a board of directors that includes a county commissioner and a township supervisor from both Wayne and Pike counties, as well as representatives from surrounding area interests: Wayne and Pike county conservation districts, Lake Watch, Lackawanna County, Monroe County, Brookfield Renewable, a wastewater treatment plant operating in the watershed, the Marine Trades' Association, and several at-large representatives. LWWMD programs that supported the restoration of the lake include water quality monitoring, public education and outreach, and cost-share funding for BMP implementation.

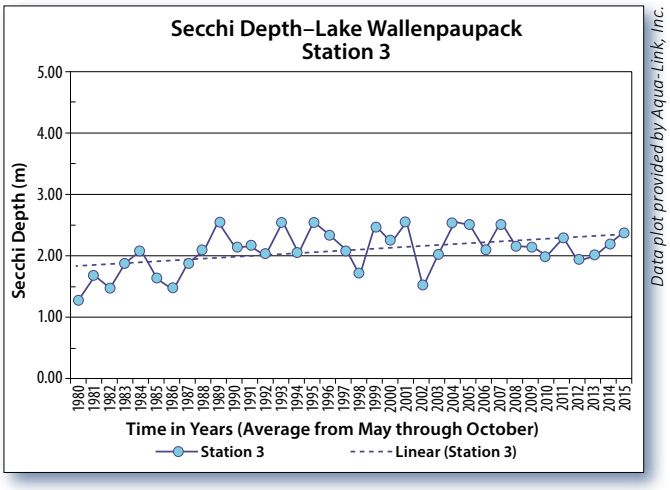

Figure 2. A trend line shows that Secchi disk depth has increased in Lake Wallenpaupack over time.

From 1987 to 1990, $479,400 in a Phase II Clean Lakes project were used for BMP implementation in the watershed, including a 50 percent match from the LWWMD. This funding was extended with $240,529 in additional finances from 1990 to 1994. A groundwater survey and water quality study were conducted by PPL Electric Utilities Corporation for a total of $75,000 in 1991 and $50,000 in 1993, respectively.

More recently, over $2.2 million has been provided through several different EPA grants, including approximately $116,000 of CWA section 319 funding. Over $800,000 in funding has been provided by the U.S. Department of Agriculture's Natural Resources Conservation Service. Additional state funding for watershed management and BMP implementation was provided in 2001–2012 with $249,580 in Growing Greener grants. These diverse grant-funded projects included $99,460 for watershed assessment and monitoring in 2001, $7,300 for the Mangan Cove Stabilization project in 2007, and $40,530 for a manure management project in 2012. Additional technical assistance has been provided by the Pennsylvania Fish and Boat Commission; funding for the LWWMD Cost-Share Program was provided by Holtwood, LLC, through the Federal Energy Regulatory Commission's Relicensing Settlement Agreement of 2006.

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-16-001KK
December 2016

For additional information contact:

Nick Spinelli
Lake Wallenpaupack Watershed Management District
570-226-3865 • nick@wallenpaupackwatershed.org
Barbara F. Lathrop
Pennsylvania Department of Environmental Protection
717-787-5017 • blathrop@pa.gov