



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

New Jersey

Restoring Streambanks and Floodplain Habitats Improves Water Quality

Waterbodies Improved

Development in the Stony Brook-Millstone (SBM) watershed led to increases in volume and intensity of stormwater runoff.

The stormwater eroded streambanks and floodplains, leading to elevated levels of total suspended solids (TSS). Monitoring data indicate that TSS levels exceeded water quality standards, which prompted the New Jersey Department of Environmental Protection (NJDEP) to add a large SBM watershed segment—now composed of three 14-digit hydrologic unit code (HUC) assessment units—to the state's 2002 Clean Water Act (CWA) section 303(d) list of impaired waters. In partnership with the SBM Watershed Association (SBMWA), NJDEP initiated numerous watershed management and educational projects and implemented a series of streambank restoration and erosion control projects within the impaired portion of the SBM watershed. TSS levels dropped, allowing the impaired portion to meet water quality standards. In 2008 NJDEP removed the segment (three assessment units) from the New Jersey CWA section 303(d) list for TSS impairment.

Problem

Stony Brook, in the Piedmont region of New Jersey, is a major tributary of the Millstone River. The SBM watershed encompasses 265 square miles in central New Jersey (Figure 1) and includes portions of 26 municipalities. The 38-mile-long Millstone River begins in Millstone Township and flows north until it joins the Raritan River. Stony Brook has headwaters in East Amwell Township and flows 21 miles eastward until it joins the Millstone River at Carnegie Lake in Princeton. The SBM watershed has a mix of urban, forest and agricultural land uses.

Extensive development over the past two decades converted significant rural portions of the watershed to commercial and residential land uses. The increases in stormwater runoff volume and intensity resulted in severely eroded streambanks and compromised floodplain habitats, which, in turn, led to increased TSS concentrations. The TSS impairment was identified when the SBMWA conducted a watershed-wide characterization and assessment of all streams and riparian habitats in 1997. The TSS impairment was confirmed by concurrent and continuing monitoring under NJDEP's ambient monitoring network. TSS concentrations exceeded the state's surface water quality standard of 40 milligrams per liter (mg/L), with a maximum recorded value of 152 mg/L in early 1997. Therefore, in 2002 NJDEP added the stream segment Stony Brook at Princeton to the 2002 CWA section 303(d) list of impaired waters for TSS.



Figure 1. The Stony Brook-Millstone River watershed is in central New Jersey.

Because NJDEP changed its basis for defining assessment units from stream segments to HUC 14 subwatersheds, this impaired stream segment translated into the listing of three HUC 14 assessment units as impaired for TSS on the 2006 CWA section 303(d) list. The TSS impairment was deemed partially responsible for the assessment units not supporting the aquatic life designated use. Arsenic and total phosphorus were also listed as the basis for nonsupport of designated uses.

The HUC 14 subwatersheds of Stony Brook include Province Line Road to 74d46m dam, Route 206 to Province Line Road, and Harrison Street to Route 206, in Princeton and Hopewell Townships.

Project Highlights

SBMWA worked with the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) and township engineers to identify sites throughout the watershed in need of restoration, erosion control and reforestation. SBMWA trained volunteers with assistance from NRCS, New Jersey Forestry Service and the Delaware Riverkeeper Network. CWA section 319 funds were used for six streambank restoration/stabilization and floodplain reforestation projects. Four restoration projects were implemented in Mountain Brook and two in the upper Stony Brook portion of the watershed.

NJDEP and SBMWA used bioengineering technologies to stabilize streambanks, minimize erosion and provide a substrate for native species plantings. Those technologies include biologs and erosion (coir) mats made from coconut fiber and wattle cuttings. The coir mats provide temporary stability for native species seedlings and wetland herbaceous plants on the streambank to help curtail erosion and to restore the riparian ecosystem. At Great Road Easement, Mountain Brook, and Princeton Community Park, scores of tree, shrub and herbaceous species were planted to provide a diverse, site-appropriate plant community.

Having addressed localized bank instability, partners implemented preventive strategies to control potential TSS input resulting from future development. Many of the municipalities in this watershed have adopted municipal stormwater management plans and established stormwater control ordinances. Such plans and ordinances ensure that any new development is designed to preserve or restore the natural hydrology of the site and protect the overall integrity of the watershed.

Results

The six streambank projects addressed several problem locations and resulted in measurable water quality improvement. After project implementation, data collected from downstream monitoring

stations in 2005 and 2006 show TSS concentrations consistently attaining the TSS surface water quality standards (Figure 2). On the basis of these data, NJDEP removed TSS from the 2008 CWA section 303(d) list as a cause of impairment in the three HUC 14 assessment units.

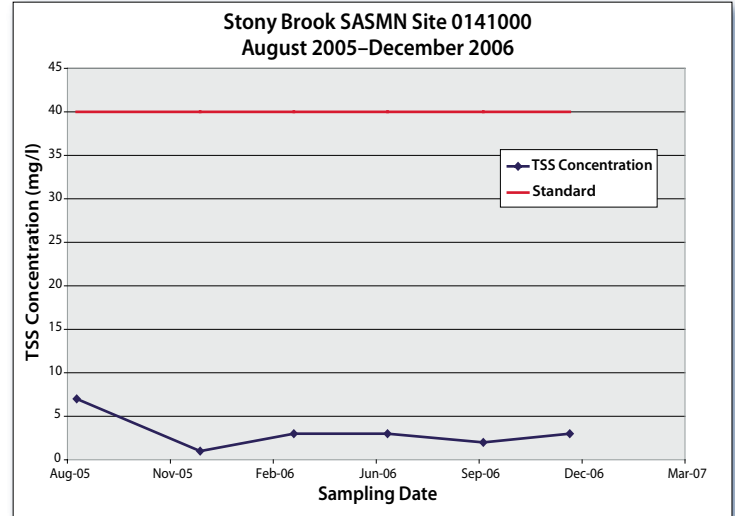


Figure 2. TSS concentrations observed in 2005 and 2006 met standards, resulting in delisting.

Partners and Funding

In 1998 SBMWA received \$132,000 in CWA section 319 grant funds to implement six streambank restoration/stabilization and floodplain reforestation projects. The NRCS and Townships of Hopewell and Princeton provided in-kind labor valued at \$54,000.

Funding for the earlier characterization and assessment study was obtained from the Mercer County Green Links Program, the Fund for New Jersey, Princeton Township, the Schumann Fund for New Jersey and the William Penn Foundation.

Continuing efforts are planned in the SBM watershed under a U.S. Environmental Protection Agency targeted watershed grant for the Raritan Basin. The New Jersey Water Supply Authority, SBMWA and NJDEP were awarded \$1 million in CWA section 319 funding for restoration, pollution prevention and reforestation projects in the lower Raritan Basin. That federal grant was matched by an additional \$1 million from other funding sources.



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