



# NONPOINT SOURCE SUCCESS STORY

## New Jersey

### Riparian Restoration and Watershed Stewardship Improve Water Quality in Bear Brook

#### Waterbody Improved

Stormwater runoff and a lack of forested riparian areas led to degraded aquatic habitat in approximately 12 miles of Bear Brook, in New Jersey's Upper Millstone River watershed. As a result, in 2002 New Jersey placed this waterbody on its Clean Water Act (CWA) section 303(d) list of impaired waters for aquatic life. The Stonybrook Millstone Watershed Association (SMWA) joined together with local partners to implement riparian restorations that contributed to water quality improvement in the watershed. These measures allowed New Jersey to remove a 12-mile segment of the Upper Millstone River, the Bear Brook assessment unit (above Trenton Road), from its 2012 list of impaired waters for aquatic life impairment.

#### Problem

The Millstone River is a 39-mile-long tributary of the Raritan River in central New Jersey (Figure 1). It receives stormwater runoff from areas of Monmouth, Middlesex, Mercer, Hunterdon and Somerset counties. Early watershed characterization efforts identified rapid urbanization of the watershed (predominately suburban housing), associated stream bank and lake shore erosion, and a loss of forested areas as likely causes for impaired water quality.

The Coastal Plain Macroinvertebrate Index (CPMI) was used to determine biological conditions in Bear Brook. CPMI assessment results are placed in four categories: *excellent*, *good*, *fair* and *poor*. CPMI results of excellent and good indicate full support of aquatic life use, while CPMIs of fair and poor indicate nonsupport. CPMI results at AN0383 showed impaired biological conditions from 1999 to 2004 with *poor* conditions in 1999 and *fair* conditions in 2004. Therefore, New Jersey added Big Bear Brook at Old Trenton Rd (Route 535) in West Windsor Township to the state's 2002 CWA section 303(d) list of impaired waters for not supporting its aquatic life use. It remained on the impaired waters list in 2004 when data confirmed that the aquatic life use was still not supported. This segment became the

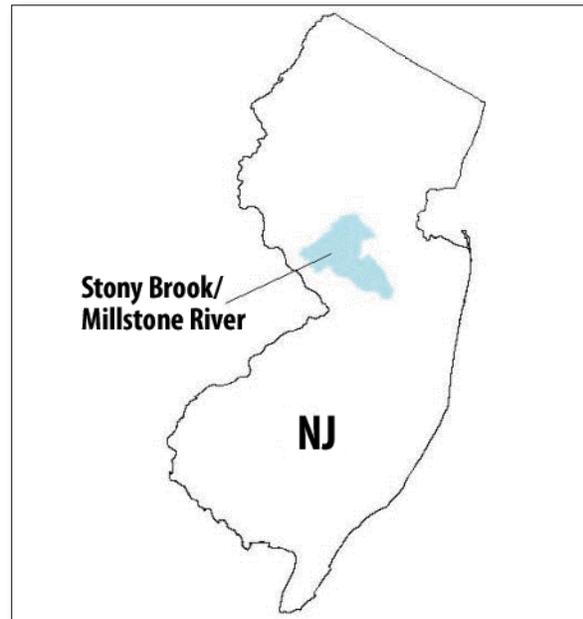


Figure 1. The Stony Brook/Millstone River watershed (light blue) is in central New Jersey.

12-mile Bear Brook Assessment unit (above Trenton Road–NJ02030105100120-01) in 2006 when New Jersey began listing based on 14-digit hydrologic unit codes.



Figure 2. In 2001, partners addressed an eroding, incised section of Bear Brook in East Windsor Township's Anker Park (as seen on left, March 2001) by implementing bioengineering and revegetation riparian restoration techniques (as seen in the middle, May 2001). By July 2014 (as seen on right), Bear Brook had a healthy, well-established riparian buffer that provides shade and protects against erosion.

## Project Highlights

In 1998 the SMWA received a CWA section 319 grant to restore the 12-mile segment of Bear Brook in East Windsor Township's Anker Park. Streambanks in this segment were stabilized and planted using bioengineering techniques and native vegetation (Figure 2). In total, the projects resulted in the restoration of approximately 1,500 linear feet of stream bank, the addition of 1,000 square feet of lake shore plantings and the reforestation of 10.4 acres of land. Although this project was completed in May 2001, it typically takes at least 5 years to become fully established. Because the 2002 impairment was based on data from 1997–2001, it would not reflect the benefits of this work. The increased tree canopy shading the stream contributed to a reduction in stream temperature, and placement of groundcover plants helped reduce sediment loading to the stream during storms.

## Results

As a result of the restoration and other stewardship activities that were implemented, the New Jersey Department of Environmental Protection's (NJDEP's) ambient monitoring data showed that Bear Brook above Trenton Road now fully supports its

aquatic life designated use. In 2009, sampling showed that the benthic macroinvertebrate community had improved to *good* and was no longer impaired. Correspondingly, Bear Brook (above Trenton Road) was delisted for aquatic life in the NJDEP 2012 Integrated Report.

## Partners and Funding

The SMWA has been an active watershed steward since 1949. SMWA was a key participant in assisting New Jersey with early watershed management activities, and helping with problem identification and education of the public regarding actions they could take to improve water quality.

In 1998 SMWA received \$132,000 in CWA section 319 funds that were used to restore Bear Brook. This restoration benefited from approximately 1,000 volunteer hours, and included participation from the municipalities within the watershed as well as the Delaware and Raritan Girl Scouts Council, Delaware River Keeper Network and other local volunteers. In addition, since 2000 the SMWA has hosted an AmeriCorps New Jersey Watershed Ambassador whose role is to engage the local community in stewardship such as cleanups and restoration activities in the watershed.



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