



NONPOINT SOURCE SUCCESS STORY

New Jersey

Conducting Cover Crop Aerial Seeding and Watershed Education Improved Water Quality in the Neshanic River

Waterbody Improved

In 2008 the New Jersey Department of Environmental Protection (NJDEP) added a section of the Neshanic River to the Clean Water Act (CWA) section 303(d) list of impaired waters for dissolved oxygen impairment due to stormwater runoff from agricultural operations and suburban development. Implementing aerial cover crop applications on farmland, installing residential green infrastructure and conducting watershed education in the Neshanic River watershed helped to reduce the amount of sediment and nutrients entering local waterbodies. As a result, dissolved oxygen levels improved, allowing NJDEP to remove the Neshanic River (below Black Brook) assessment unit (14-digit hydrologic unit code [HUC-14] 02030105030070) from the 2016 CWA section 303(d) list for the dissolved oxygen impairment.

Problem

The Neshanic River watershed is in Hunterdon County and encompasses portions of Flemington Borough, as well as Raritan, Delaware and East Amwell townships. The 31-square-mile area includes Walnut Brook and the First, Second and Third Neshanic Rivers that meet to form the Neshanic River's main branch, which is immediately above the confluence with Black Brook (Figure 1). The Neshanic River empties into the Raritan River.

The Neshanic River is listed as impaired for a variety of pollutants, including pathogens, nutrients and dissolved oxygen. The impairments are mostly the result of untreated stormwater runoff from agricultural operations and suburban development, which comprises much of the land use in this watershed.

Story Highlights

In 2005, NJDEP awarded a \$561,678 CWA section 319(h) grant to the New Jersey Institute of Technology to develop a Neshanic River watershed-based plan. The plan was approved by NJDEP in 2012, and it included a prioritized list of implementation measures to address and remediate the specific water quality impairments throughout the watershed. Implementation of cover crops was indicated in the approved plan as a top cost-effective measure to address nutrient and sediment inputs to the Neshanic River.

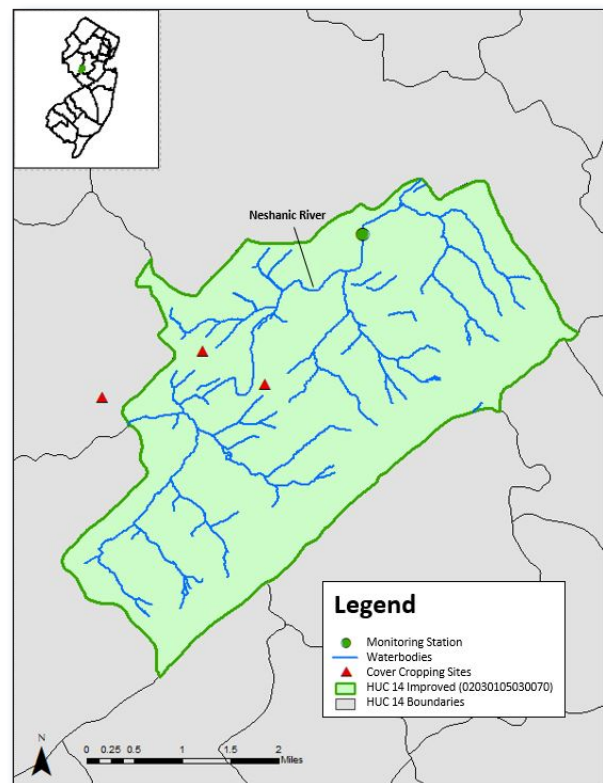


Figure 1. The Neshanic River (below Black Brook) assessment unit, shown in light green, is in midwestern New Jersey.



Figure 2. Sediment and nutrient levels in stormwater runoff were reduced by establishing cover crop vegetation on farms fields via aerial spraying after crops were harvested.

In 2012, NJDEP awarded a CWA section 319(h)-funded grant to the North Jersey Resource Conservation and Development organization (NJRC&D) to begin implementing the approved watershed-based plan. The plan identified several types of implementation measures to reduce nutrient and sediment in stormwater runoff, including the use of cover crops established by aerial seeding and the implementation of low-cost green infrastructure such as rain gardens and vegetative buffers. In September 2014, a total of 557 acres of aerial crop cover seeding was implemented in several Neshanic River subwatersheds (HUC-14s 02030105030060, 02030105030070 and 02040105210010).

In December 2014, the public was invited to a “Cover Crop Field Day” that included an overview of the cover crop/soil health initiative and tentative results from the fall 2014 planting. Additional information was provided on how to participate in the cover crop program and how to implement other best management practices (BMPs) to reduce the volume and improve the quality of stormwater runoff in Neshanic River watershed. In September 2015, aerial cover crop seeding was completed on an additional 311 acres within Neshanic River subwatersheds (HUC-14s 02030105030060 and 02030105030070) (Figure 2).

The 886 acres of cover crops that were planted in 2014–2015 stabilized the soil on crop land that would otherwise have been left unvegetated between harvest time and the following spring planting season.

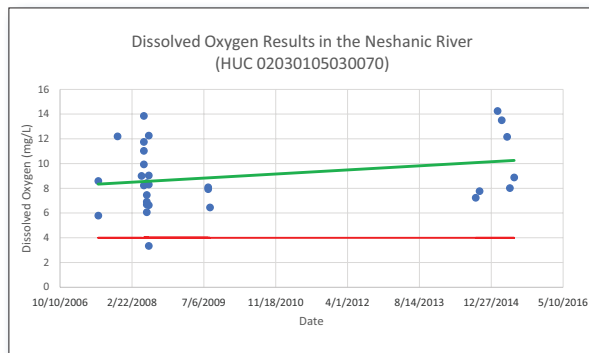


Figure 3. Neshanic River (below Black Brook) assessment unit sampling data used in the evaluation that allowed removal of this waterbody from the 2016 CWA section 303(d) listing for dissolved oxygen impairment.

Results

Establishing cover crops reduced the amount of sediment and nutrients in stormwater runoff while improving soil health on the farms that participated in the project. Reducing sediment and nutrients improved the downstream dissolved oxygen levels in the Neshanic River. The latest data from Station 1398065 demonstrates dissolved oxygen met the corresponding water quality standard of a minimum of 4 milligrams per liter (mg/L) for the 2016 assessment period (Figure 3). As a result, the Neshanic River (below Black Brook) assessment unit was delisted for dissolved oxygen in the 2016 Integrated Report. This assessment unit is immediately downstream of farms where cover crops were established via aerial seeding.

Partners and Funding

NJDEP awarded NJRC&D \$541,300 in CWA section 319(h) grant funds in 2012 for the implementation of agricultural BMPs (e.g., aerial cover crop planting), residential green infrastructure projects (e.g., rain barrels, rain gardens), and education and outreach initiatives in support of the grant projects and goals of the watershed-based plan. Project partners included New Jersey’s AmeriCorps Watershed Ambassadors, Hunterdon County Soil Conservation District, Natural Resources Conservation Service–Frenchtown Service Center, New Jersey Water Supply Authority, Rutgers Cooperative Extension Water Resources Program and the New Jersey Tree Foundation. This grant funded project was completed in April 2018.



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