NONPOINT SOURCE SUCCESS STORY

New Jersey

Implementing Green Infrastructure Projects Improved Water Quality in the Rahway River

Waterbody Improved

Extensive urbanization resulting in a severely degraded stream corridor led the New Jersey Department of Environmental Protection (NJDEP) to add the lower section of the Rahway River to the 2012 Clean Water Act (CWA) section 303(d) list for dissolved oxygen impairment. Green infrastructure practices implemented in the Robinsons Branch watershed (an upstream tributary) reduced the amount of untreated stormwater runoff entering the lower Rahway River. As a result, dissolved oxygen levels in the river increased, which prompted NJDEP to remove the Rahway River (below Robinsons Branch) assessment unit from the 2014 CWA section 303(d) list for the dissolved oxygen impairment.

Problem

The 24-mile-long Rahway River begins in Union Township in northeastern New Jersey and empties into Arthur Kill, a tidal strait/navigational channel between New Jersey and Staten Island, New York (Figure 1). Tides influence the lower Rahway River from the Pennsylvania Railroad Bridge at the City of Rahway down to the river's mouth.

The Rahway River is impaired by a variety of pollutants. The NJDEP included multiple assessment units on the state's 2012 CWA section 303(d) list of impaired waters, including a low dissolved oxygen impairment listing for the Rahway River (below the Robinsons Branch) assessment unit (hydrologic unit code [HUC] 02030104050100).

The Robinsons Branch watershed encompasses approximately 22 square miles within densely developed Union and Middlesex counties in New Jersey. Because urban land uses comprise more than 80 percent of the Robinsons Branch watershed, a significant cause of the impairments in the downstream Rahway River is the extensive impervious area that drains directly to the waterbody.

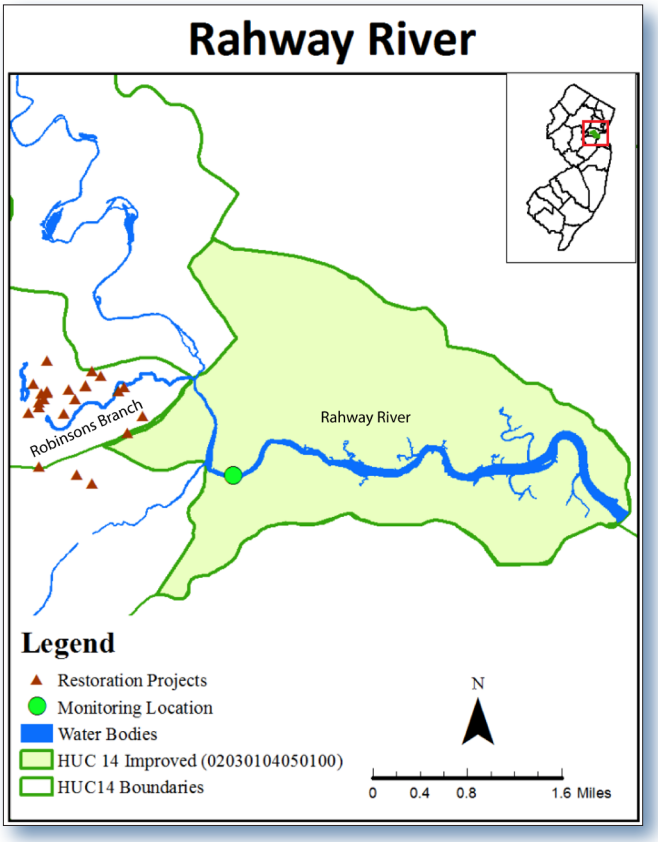

Figure 1. The Rahway River (below the Robinsons Branch) assessment unit, shown in light green, is in northeastern New Jersey. It is immediately downstream of numerous green infrastructure restoration projects that were installed along the upstream tributary of Robinsons Branch.

Story Highlights

In October 2008, Rutgers University completed the Robinsons Branch Regional Stormwater Management Plan (a watershed-based plan) to address urban runoff in the Robinsons Branch watershed. The plan outlined

Figure 2. Practices included porous asphalt areas that allow stormwater runoff to infiltrate into the ground instead of draining directly to streams.

Figure 3. Practices included a car wash system comprised of a cistern, concrete wash pad and rain garden that captures, reuses and treats stormwater.

opportunities for the implementation of stormwater best management practices (BMPs) and management strategies to reduce peak flows from high-frequency storms. The plan identifies urban runoff as a significant source of pollutants, including those that affect dissolved oxygen levels.

Project sites for the implementation of green infrastructure were identified and prioritized in the approved plan. Rutgers, along with local stakeholders, began implementing the plan in 2010. BMPs that were adopted as part of the Regional Stormwater Management Plan include installing porous pavement in numerous parking lots, driveways, and recreational areas; constructing rain gardens in residential areas and a public park; and collecting and reusing stormwater (Figure 2). For example, partners installed a "green" car wash system, which includes a 5,000 gallon cistern that collects stormwater from the roof of the public works building for use in washing vehicles, a concrete vehicle wash pad, and a rain garden for treatment (Figure 3).

In addition to on-the-ground work, education and outreach was also facilitated within the Robinsons Branch Watershed. In 2014, 25 municipal representatives participated in a course on rain garden design and installation methods. They toured rain gardens and spoke with residents about their new gardens. As a result, participants have facilitated the construction of six additional rain gardens within the watershed.

Results

The Rutgers Cooperative Extension Water Resources Program and project partners implemented 28 green infrastructure projects and practices throughout the Robinsons Branch watershed (see Figure 1). Together these measures greatly reduced untreated stormwater runoff from impervious surfaces through infiltration.

The following annual reductions were observed: 1.7 pounds (lbs) of total phosphorus, 118.5 lbs of total suspended solids, and 954,399 gallons of stormwater runoff. The latest data from station NJHDG-11 show dissolved oxygen met the corresponding water quality standard of 3 milligrams per liter (mg/L) for the 2014 assessment period. As a result, the Rahway River (below Robinsons Branch) assessment unit was delisted for dissolved oxygen in the 2014 Integrated Report.

Partners and Funding

Green infrastructure projects were completed by Rutgers. NJDEP awarded Rutgers $512,000 in CWA section 319(h) grant funds beginning in 2010. Other project partners included Rahway City, Rahway River Watershed Association, Clark Township, and local landowners. Project partners' significant volunteer efforts to engage local stakeholders, homeowners, and the general public played an important role in the implementation of the BMPs.

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

EPA 841-F-20-001E
January 2020

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