NONPOINT SOURCE SUCCESS STORY

New Jersey

Stormwater Projects Improve Water Quality in the Lower Section of the Raritan River

Waterbody Improved

In 1993, the New Jersey Department of Environmental Protection (NJDEP) added the lower section of the Raritan River (I-287 Piscataway-Millstone assessment unit) to the Clean Water Act (CWA) section 303(d) list of impaired waters for biological impairment. The impairment was attributed to excessive nutrients, pollutants, and water runoff from the highly urbanized tributary to the Delaware and Raritan Canal (D&R Canal), which is used for drinking water and recreation. In 2001 and 2005, the NJDEP awarded funds to the New Jersey Water Supply Authority (NJWSA) to develop and implement the D&R Canal Tributary Assessment and Nonpoint Source Management Project Plan. As a result, the waterbody's improved biological condition achieved "delisted status" as part of the 2018–2020 New Jersey Integrated Water Quality Assessment Report.

Problem

The D&R Canal is a locally beloved recreation area within the Raritan River watershed (Figure 1). The canal serves as a significant source of drinking water for approximately 600,000 people in central New Jersey. The lower Raritan River watershed is in a highly urbanized area that includes residential and commercial development. The high percentage of impervious surfaces has contributed to increased stormwater flow and its corresponding impacts on the Raritan River. The increased stormwater flow increases the frequency and intensity of flooding, which can destabilize streambanks, cause scouring, and increase the levels of sedimentation and other nonpoint pollutants such as nutrients and total suspended solids (TSS). Benthic macroinvertebrate samplings have been analyzed every five years and have shown impaired conditions since 1993. As a result, NJDEP added the lower section of the Raritan River (I-287 Piscataway-Millstone assessment unit: hydrologic unit code 02030105120140) to the 1993 CWA section 303(d) list for biological impairment.

Story Highlights

In 2001, NJDEP awarded $60,000 in CWA section 319(h) nonpoint source funding to NJWSA to develop the D&R Canal Tributary Assessment and Nonpoint Source Management Project plan, which focused on identifying and mitigating nonpoint sources of pollution from influent waters to the canal in Franklin Township and South Bound Brook Borough. NJWSA identified potential stormwater improvement projects to address the pollutant loads from the top 15 stormwater infalls and drainage areas. In 2005, the NJDEP awarded another CWA section 319(h)-funded grant ($350,000) to implement the plan.

Figure 1. The Raritan River is in central New Jersey.

NJWSA completed two retrofits, for infalls 21 and 38, during the project's implementation phase. The Infall 21 drainage area, primarily comprised of residential areas, had a nutrient separating baffle box and five Filterra (vegetated inlets) installed (Figure 2). The

Figure 2. Installation of a baffle box at Infall 21.

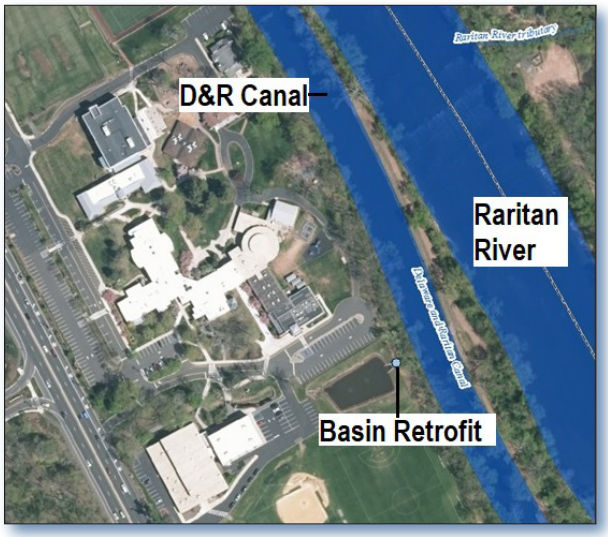

Figure 3. Location of a basin retrofit: Infall 38.

Infall 38 drainage area contains a portion of Rutgers Preparatory School, a portion of the Somerset at Avalon residential complex, and additional residential areas. A stormwater dry basin was placed at the outlet of the drainage area to the canal (Figure 3). The project plan recommended retrofitting this basin into a wet pond, and the project was completed by Rutgers Preparatory School during their expansion project in 2009.

Results

The NJWSA and the Rutgers Preparatory School oversaw the construction of the infalls 21 and 38 projects, respectively, with the goal of controlling the levels of NPS pollution in the D&R Canal. Infall 21 consisted of installing a baffle box and five Filterra units. The baffle box results showed a 32.8% reduction in phosphorus loads, a 35.8% reduction in biological oxygen demand (BOD) loads, and a 71.9% sediment reduction. The Filterra units results also showed success in reducing nutrient/sediment loads by reporting a 37.5% reduction of phosphorus loads, a 40% reduction in BOD loads, and 82.5% reduction of sediments loads.

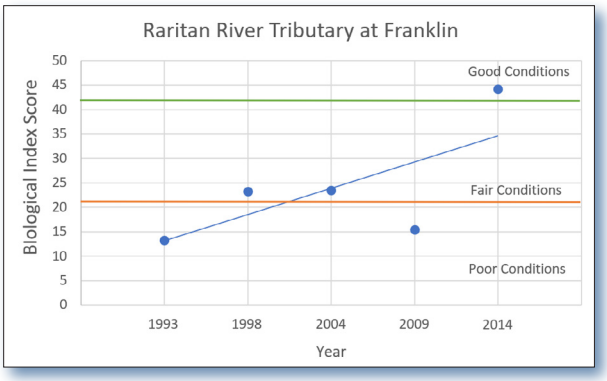

Figure 4. Biological index score for the Raritan River tributary at Franklin (1993–2014).

The retrofit of Infall 38—installing a stormwater dry basin at the outlet of the drainage area to the canal—also reduced pollutants. Results for Infall 38 showed a 24.8% decrease in nitrogen, a 33.9% decrease in phosphorus, and a 40.6% decrease in sediments. Together, the projects at both of these infalls achieved significant load reductions, which contributed to the health and sustainability of an important watershed for the central New Jersey community. Data show a corresponding improvement in the biological index score for the Raritan River (Figure 4).

Partners and Funding

The two projects were completed by the NJWSA and the Rutgers Preparatory School along with Princeton Hydro, who assisted with design and permitting, and installation. The original investment of $60,000 in CWA section 319 grant funds in 2001 to complete the D&R Canal Tributary Assessment and Nonpoint Source Management Project Plan was subsequently supported by a $350,000 investment in 2005 to implement this project. NJDEP awarded additional funding in 2006 and 2007 for stormwater retrofitting projects in the area.

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