NONPOINT SOURCE SUCCESS STORY

Maryland

Baltimore County Project Restores Stream Channel on Roland Run

Waterbody Improved   Historical mapping indicates that Roland Run and Thornton Road Tributary follow similar flow paths from Lutherville to Lake Roland. However, most of the channel was likely altered in the 1950s to accommodate development, including housing, infrastructure, utilities, and a ballfield. These historic alterations were considered the primary contributors to this stream's instability. Restoration and stabilization efforts in the mainstem helped improve the integrity and function of the stream and extended bank protection in critical areas. Community outreach efforts educated landowners about the historical degradation of the stream channel and the project plans designed to stabilize and restore Roland Run. The project produced a stabilized stream channel with better baseflow and floodplain connection. Monitoring will be required by the U.S. Army Corps of Engineers (USACE) and the Maryland Department of the Environment (MDE).

Problem

Roland Run is a tributary of Jones Falls, with head-waters in Timonium, Maryland. Roland Run flows south through Lutherville, where it joins Jones Falls in Lake Roland (Figure 1). The Thornton Road tributary to Roland Run originates north of Timonium Road, flowing south and crossing Seminary Road, Interstate 695, and Thornton Road. Historical mapping indicates that Roland Run and the Thornton Road Tributary have followed similar flow paths from Lutherville to Lake Roland as they do today. As a result of development during the 1950s, most of the channel was likely altered to accommodate housing, infrastructure, utilities, and a ballfield. Roland Run was listed on Maryland's CWA section 303(d) list of impaired waters for nutrients, sediment, and other pollutants.

Story Highlights

In 2001, the design firm, Century Engineering, completed site surveys, an environmental constraints analysis, a geomorphic assessment, engineering models, permitting, plans, and cost estimates for a project to stabilize and restore the mainstem of Roland Run. The Thornton Road Tributary's nested channel design provided multiple grade control structures and bank protection for higher-flow events. Cross-vane structures drop flow over a shorter distance, creating larger, low-stress areas where intermittently submerging vegetated banks improve baseflow and floodplain connection.
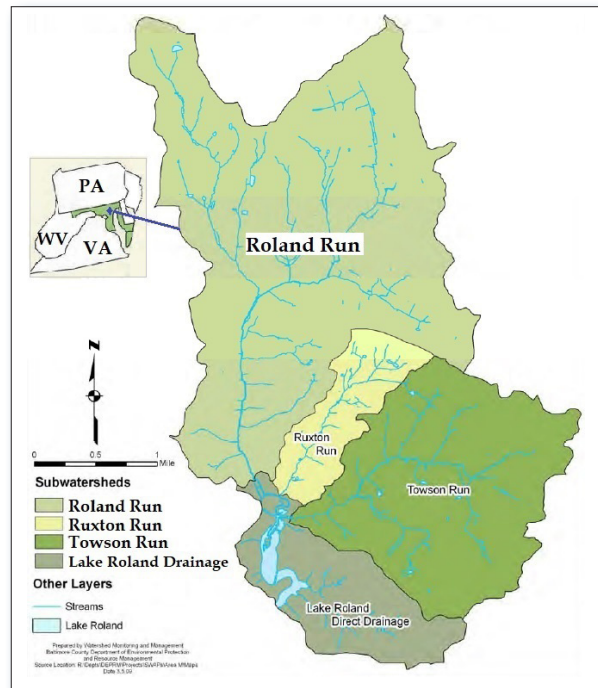

Figure 1. Roland Run is in Baltimore County, MD.

The maintenance of the 2001 mainstem project helped the integrity and function of the stream and extended bank protection in critical areas. Installing 120 linear feet of imbricated riprap bank protection beyond the original 2001 project addressed a high vertical streambank

Figure 2. Two areas of Roland Run, before (left) and after (right) restoration was completed

Figure 3. Pre-and post-construction bank stream scores at Roland Run.

adjacent to the ballfield within Essex Farm Park. These practices reduced sediment and nutrient inputs and addressed an ongoing safety issue for park users. Costs of the maintenance and new imbricated riprap bank protection were not paid for by matching funds.

This project was entirely within a Baltimore County-owned area, except for two parcels on Jeffers Road along Roland Run. A signed permission was issued for work to occur on these properties. Certified letters notifying adjacent property owners of the planned stream restoration project were sent. A community meeting was held in May 2019 to inform landowners of construction plans and answer questions. A link to Baltimore County's community outreach video describing stream restoration, including several educational components, such as trash and watershed connections, was provided to the community.

Results

This project stabilized the stream channel and established better baseflow and floodplain connection (Figure 2). The project restored the eroding streambed and channel banks, reducing sediment and nutrient input. The hyporheic zone (defined as the porous layer beneath a stream bed where groundwater and surface water mix) and substantial floodplain wetlands provide additional nutrient reduction and improved stream ecology. Landscape adjustments shifted the eroding channel off private property and provided on-site coverage of sanitary sewer lines.
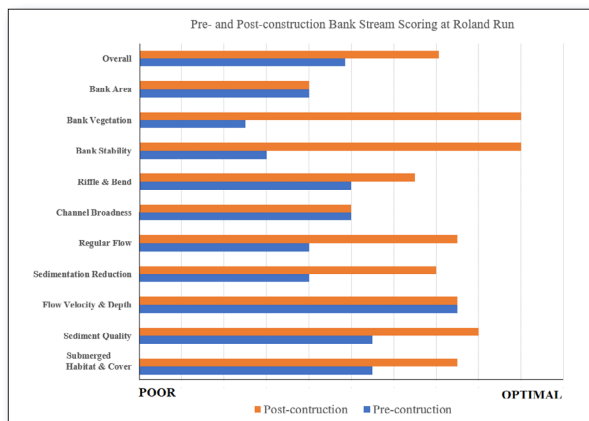
Vegetation stabilization has been achieved since construction was completed. Storm flows in the tributary now frequently overtop the floodplain in a lower energy and non-erosive manner. The new retrofitted channel performed as designed in multiple significant storm events. The invasive plants treated before construction continue to be treated throughout the area. A more robust native riparian buffer has been established, along with an aesthetically pleasing park area for the community and surrounding landowners.

Monitoring is required as part of the USACE- and MDE-issued permits. The monitoring requires ongoing physical surveys of channel stability, vegetation diversity/viability, invasive species management, and stream habitat quality over a three- to five-year period. Results will be presented with annual reports submitted to the overseeing agencies. Stream scores collected before and after construction show improved stream bank scores at Roland Run (Figure 3).

Partners and Funding

Expenses to date totaled $988,253 for design, construction, and monitoring. Funding included state grants ($525,944) and EPA section 319 grant funds ($462,309). A contractor, Stormwater Maintenance and Consulting, performed the construction services. Many federal, state, and local agencies were involved throughout the project, including the Baltimore County Department of Environmental Protection and Sustainability, Baltimore County Soil Conservation District, and MDE.

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