From runoff to results:
The Willow Creek Watershed Improvement Project

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Skaneateles Lake is a vital drinking water source for over 165,000 people, including the City of Syracuse, and remains one of the few unfiltered municipal water supplies in New York State. Its pristine waters, however, are increasingly threatened by sediment and nutrient runoff, which can impair water quality and contribute to Harmful Algal Blooms (HABs). Addressing these challenges often requires a collaborative approach, balancing large-scale conservation initiatives with the everyday actions of local landowners.

For landowners like Dan Pajak, taking action to protect both their property and the lake was a clear choice. "With neighboring development and more intense storms, we needed to do something to protect our land from eroding and do our part in caring for the lake," said Pajak. "We were more than happy with the outcome and are fortunate to have the Skaneateles Lake Association navigating a pathway to success."

The Willow Creek Watershed Improvement Project embodies this approach. This tributary, historically a source of sediment and nutrient runoff, was identified as a priority restoration site under the Skaneateles Lake Watershed Improvement Project (SWIP) initiative. In response, the Skaneateles Lake Association (SLA) partnered with conservation experts, landowners, and regional funding programs to implement science-based restoration efforts aimed at improving water quality and reducing sediment loading.

Willow Creek has long been a contributor to sediment and nutrient runoff, which can carry phosphorus and nitrogen that ultimately feed algal blooms and degrade water quality. Its proximity to one of the City of Syracuse's drinking water intake pipes made it a key site for intervention. Prioritizing this project was essential to reducing phosphorus and sediment entering the lake and safeguarding drinking water quality (Figure 1).

Restoration effort

The Willow Creek restoration effort, designed by Anchor QEA engineers, incorporated a variety of best management practices to stabilize streambanks, manage stormwater, and enhance habitat resilience.

Figure 1. Lower Willow Creek "chocolate milk" flood prior to improvement project.

The overall project included two key locations and multiple improvement strategies. First, in the upper reaches of the stream, a diversion channel was installed to intercept high-flow stormwater and settle out nutrients in an expanded wetland basin before returning to the stream (Figure 2). Second, in the lower reaches of the stream before entering the lake, a series of sediment capture and stream stabilization elements were incorporated. The lower Willow Creek project consists of root wads installed to slow down the stream flow, reduce its erosion energy, and capture sediment. Additionally, the floodplain area was expanded and native plants were established to take up nutrients after they settled (Figure 3).

Local businesses also saw an opportunity to contribute. Eric Brillo noted that their team's expertise in land improvement services and machinery made partnering with the Willow Creek project a natural fit. "With our business including land improvement services and having machinery and know-how to support Willow Creek in our own backyard, it was a perfect fit for us to support the project and Skaneateles Lake."

Assessing progress

A critical yet often overlooked aspect of restoration projects is assessing their impact. To fill this gap, the Upstate Freshwater Institute (UFI), in partnership with SLA, launched a monitoring program in August 2024. Using Onset HOBO water pressure loggers, stream levels are being measured every 15 minutes to track peak flow events – critical moments when sediment and nutrients are most likely to be transported downstream. Targeted water sampling during high-flow events provides crucial data on turbidity and nutrient concentrations, including phosphorus, nitrogen, and total suspended solids. Early results reveal a promising 18 percent reduction in sediment between the upstream and downstream sites at lower Willow Creek. While these are preliminary results, continued monitoring through 2025 will provide valuable insights into long-term trends and effectiveness.

Costs

The total cost of the Willow Creek project, including design, implementation, and ongoing monitoring, was estimated at just over $225,000. Funding sources included $95,000 from the Skaneateles Lake Association, $45,000 from the Great Lakes Commission via the Great Lakes Sediment & Nutrient Reduction Program, and additional cost-sharing and in-kind contributions from landowners.

Beyond financial support, community engagement played a key role. SLA and its partners hosted educational workshops and site visits to inform local residents about best management practices. The success of the Willow Creek project is a testament to the landowners, businesses, and organizations that came together to protect the watershed. By demonstrating the impact of these projects, more landowners have been inspired to implement similar measures on their own properties.

While large-scale projects like Willow Creek require significant planning and investment, they demonstrate the power of simple, cost-effective steps that individuals

Figure 2. Upper Willow Creek's high-flow diversion structure sending overflow sediment and water to a wetland basin.

Figure 3. Stabilization efforts along lower Willow Creek during storm capturing sediment.

can take to improve water quality. Key takeaways include stabilizing creek banks through native plantings or rock stabilization, establishing buffer zones to filter runoff, reducing impervious surfaces to slow runoff, and participating in local watershed programs to gain access to resources and expertise (Figure 4).

As data collection continues, the monitoring program will refine our understanding of how restoration projects influence long-term water quality. Future restoration efforts will build upon these findings, ensuring that best management practices are as effective as possible. The Willow Creek Watershed Improvement Project highlights the importance of proactive, community-driven conservation. Whether through large-scale restoration efforts or individual property stewardship, protecting Skaneateles Lake is a shared responsibility. By working together, we can ensure that its waters remain clean, clear, and healthy for generations to come.

Frank Moses serves as the Skaneateles Lake Association's (SLA) executive director. Frank joined the effort in protecting Skaneateles Lake in 2019. He brings with him a strong background in water ecology, non-profit management, conservation, and community engagement. Frank has been instrumental in advancing SLA's mission through its key program areas in Invasive Species Prevention and Management, Watershed Wide Community Collaboration, Environmental Education, and addressing Harmful Algal Blooms through research and data-driven decision making associated with implementation of Skaneateles Lake Watershed Improvement Projects. He can be reached at frank.moses@skaneateleslake.org.

Sistina Honold (she has elected not to submit a bio or headshot)

Monica Caves is a research scientist and outreach coordinator at the Upstate Freshwater Institute – a Syracuse, NY-based not-for-profit organization devoted to advancing freshwater research and education. With a lake management background from SUNY Oneonta, she thrives on translating complex data into actionable insights for lake stakeholders, helping to drive informed decisions that protect and enhance freshwater ecosystems. Visit www.upstatefreshwater.org to learn more about the UFI team.

Figure 4. Enhanced plant area along lower Willow Creek.