What was once an eyesore and a safety hazard is becoming an aesthetic amenity and a maintenance time-saver at the Lost Nation Municipal Golf Course in Willoughby, Ohio. Before restoration, Ward Creek’s streambanks were stable in the out-of-play forested areas of the golf course, but through the in-play areas the creek resembled a gully in many places, with exposed clay banks, a silt bottom, and broken concrete used in stabilizing bridge crossings. The shallow turf roots offered little protection against streambank erosion. At Hole 13, erosion had caused a steep, 8-foot drop-off that was dangerously close to a cart path. The city was losing revenue due to flooding of in-play areas, and the creek was becoming too silty to be used as a source of irrigation for the greens.
PARTNERING UP

Nearly one-third of Ward Creek’s watershed is covered with hard surfaces: rooftops, driveways, streets, and parking lots, many of which do not have any stormwater-control measures to slow and treat runoff before it enters the creek. When rain occurs, stormwater runoff flows rapidly to the stream, carrying pollutants and causing localized flooding and streambank erosion.

City officials shared their concerns about this problem with Chagrin River Watershed Partners Inc. (CRWP), a nonprofit organization that assists communities with flooding and erosion problems. CRWP received a $286,391 Great Lakes Restoration Initiative grant from the U.S. Environmental Protection Agency to work with the city to restore over 2,900 feet of the creek within the course as part of a broader effort to reduce and manage stormwater runoff in the watershed. The project also includes installing infiltration areas in parking areas of an upstream shopping mall, free rain-garden kits, rain barrels and shade trees for homeowners, a demonstration residential rain-garden within a city park, and tree planting at a local school.

SELECTING MATERIALS

To restore the streambanks in areas out of play, shrubs and trees were planted. Woody vegetation offers the best streambank-erosion prevention because the deep roots help hold the soil in place. For areas in the line of play, native short-grass meadow species were planted, which also have deeper roots than turf grass. In addition to stabilizing the streambanks, the buffer of native vegetation acts as a filter that removes pollutants that water picks up as it travels over land before entering the creek. Mitch Allen, golf course manager, determined that the maximum width of buffers of native vegetation on both sides of the creek, plus the width of the stream itself, could be up to 80 feet to maintain course playability.

SIGNING CONTRACTS

To limit the impact to golf course revenue, the request for proposals for design-build contracting teams stated that the work must be completed after Labor Day—when the golf season begins to wind down in northeast Ohio. The request for proposals also required bidders to have successfully completed at least three stream-restoration projects and have experience with golf course design and/or construction to be eligible to submit proposals. The team selected for this project included a golf course architect and a construction firm experienced in golf course work and stream restoration.
GETTING STARTED

Restoration plans included grading the streambanks to more stable slopes to reduce erosion and allow the stream to access the floodplain during high flows to alleviate flooding in downstream areas of the course. Instream bendway weir and riffle structures were proposed to minimize erosion, stabilize the stream corridor, protect bends, and reduce the energy of water flowing near the banks. Riffle structures oxygenate the water and provide better habitat for stream life in addition to stabilizing the stream. Ultimately, the earthwork for the project occurred in late October and early November, and therefore had little impact on business. Construction moved forward one hole at a time to further minimize disruptions.

As the earthwork was completed, areas were stabilized with temporary erosion-control matting and native seeds. In the spring, the contractor planted live stakes and container shrubs in the restored areas. Because native seed often takes a couple of years to reach its potential, the planned in-play meadow areas did not immediately have the anticipated aesthetic appeal. These areas were jump-started with one-gallon native perennials from a local nursery for immediate impact. Because of this experience, CRWP recommends that similar projects budget for container stock as well as seed.

WRAPPING IT UP

The golf course superintendent’s favorite aspect of the project is a riffle structure that creates a small waterfall effect over the cobble streambed while also reducing the erosive energy of the stream. Incorporating structures like these may increase the aesthetic appeal of restorations within public parks and golf courses. Golf course staff members have been pleased with the overall outcome, commenting that the restoration has reduced maintenance costs because many areas that were previously mowed weekly were replaced with native grasses and woody vegetation that only require maintenance once or twice a year.

The Chagrin River Watershed Partners is using this project as a model for future stream-restoration projects within golf courses and public parks. For more information, visit www.crwp.org.

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