WILLOUGHBY-EASTLAKE SCHOOLS

East Branch of Euclid Creek Restoration at the Willoughby-Eastlake School of Innovation Design-Build

Willoughby Hills, Ohio



ver the last 150 years, 85% of the Euclid Creek watershed in Northeast Ohio has become developed. As a result, fast-flowing stormwater from the region's increasingly impervious surfaces has degraded many of the regional waterways. One of them is Euclid Creek, a direct headwater tributary to Lake Erie and part of the Cuyahoga River Area of Concern (AOC). AOCs are waters in the U.S. and Canada that are impaired in their ability to support aquatic life or beneficial uses based on the U.S.-Canada Great Lakes Water Quality Agreement.

To address Beneficial Use Impairments and improve water quality within the watershed, the Cuyahoga Soil and Water Conservation District initiated the restoration of a degraded portion of the East Branch of Euclid Creek. Because the stream flowed through the grounds of the STEM-based Willoughby-Eastlake School of Innovation, which integrates engineering and real-world problem solving into its curriculum, the project presented an opportunity to immerse students in an actual stream restoration.

An undersized double culvert in the overhead utility rightof-way at the downstream end of the degraded reach had caused significant sediment deposition within the reach, as well as bank erosion. Because of the sediment deposition, Urban stream restoration improves water quality while providing STEM students with unique educational opportunities in a living, outdoor classroom.

the stream offered minimal aquatic habitat as riffles and pools were mostly absent. Biohabitats' approach was to restore ecological systems and processes to regenerate stability, habitat, and function to the stream. The design involved removing the double culvert and replacing it with a riffle ford crossing. Eroding banks were graded to stable angles to increase floodplain connectivity or stabilized with boulder packing.

Biohabitats worked with faculty and administration to integrate every phase of the project, from assessment and design to construction and post-restoration, into the curriculum and ensure that the site would provide hands-on learning opportunities into the future in a new "Land Lab." Students helped assess initial conditions by sampling water quality and learning about invasive species. They also participated in a design charrette, where they shared their ideas and unique perspectives as future users and stewards of the creek.

Students will help plant trees, shrubs, and plugs once the stream work is complete and they will design herbivory protection prototypes to help protect the plants from the abundant deer population. For the foreseeable future, part of the school's experience will include monitoring water quality, invasive species, wetlands and stream habitat.

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