Prior to the Fall of 2013, the stream segment between Forest Ridge Preserve and Chagrin River Road was nothing more than a channelized ditch, much of which was contained within a culvert. With the help of a $144,500 Surface Water Improvement Fund (SWIF) Grant from the Ohio Environmental Protection Agency, the Village of Moreland Hills was able to restore the stream in a manner that mimics the high quality characteristics found immediately upstream.

**Our Goal**
The primary goal of this project was to create a headwater stream with a healthy self-sufficient ecosystem that feeds clean water into the Chagrin River. An accessible floodplain, healthy native plant species, stabilized banks, and structure for stream energy dissipation are the building blocks that will help to achieve this long term goal.

**Work That Was Done**
- Removed 170 linear feet of culvert and restored 490 linear feet of stream channel with an 8-foot average width and a 1-foot average depth. **Gravel and cobble substrate** was introduced for multiple purposes, including bank and bed protection, energy dissipation and habitat creation.

**Stream Quality Upstream of the Project Area**
- Classified as a cold-water Class III primary headwater habitat*
- Home to the Two-lined Salamander (Eurycea bislineata) and macro-invertebrates (bugs) that only live in consistently cold, high-quality water

**Stream Quality Within the Project Area**
- Classified as a degraded Class II modified stream*
- 320 linear feet channelized
- 170 linear feet contained within a culvert
*Ohio EPA headwater habitat evaluation index methodology

View from the start of project (upstream end)
- Created **floodplains** by converting the narrow, deep gully into a wider, shallower channel where floodwaters can spill out beyond the streambanks.
- Established one acre of **riparian forest** comprised of native plant species that provide streamside shade and bank protection, as well as high-value food and shelter for wildlife.

**What Was Planted?**
- **Trees:** Bald Cypress, Black Gum, Red Oak, Eastern Redbud, American Sycamore, and River Birch
- **Shrubs:** Red Osier Dogwood, Silky Dogwood, Spicebush, Arrowwood, and Willow (Sandbar, Streamco & Black)
- **Grasses and flowers:** multiple species that thrive in wet meadows, wetlands and streamside settings

**Ripple grade controls** made of boulders, allow flow to transition from a high elevation to a lower elevation in a controlled manner, thereby minimizing erosion of the streambed.

**Log vanes** were placed to direct stream flow away from the streambanks and in toward the center of the channel.

**Micropools** were placed immediately downstream of log vanes to absorb the energy of the water flowing over them, minimize streambed erosion and provide in-stream habitat.

Log vanes were placed to direct stream flow away from the streambanks and in toward the center of the channel.

**Micropools** were placed immediately downstream of log vanes to absorb the energy of the water flowing over them, minimize streambed erosion and provide in-stream habitat.

Ripple grade controls made of boulders, allow flow to transition from a high elevation to a lower elevation in a controlled manner, thereby minimizing erosion of the streambed.

**What Was Planted?**
- **Trees:** Bald Cypress, Black Gum, Red Oak, Eastern Redbud, American Sycamore, and River Birch
- **Shrubs:** Red Osier Dogwood, Silky Dogwood, Spicebush, Arrowwood, and Willow (Sandbar, Streamco & Black)
- **Grasses and flowers:** multiple species that thrive in wet meadows, wetlands and streamside settings

This publication was financed in part or totally through a grant from the Ohio Environmental Protection Agency under provisions of the Surface Water Improvement Fund and the US EPA Great Lakes Restoration Initiative. The contents and views, including any opinions, findings, or conclusions or recommendations, contained in this product or publication are those of the authors and have not been subject to any Ohio EPA peer or administrative review and may not necessarily reflect the views of the Agency, and no official endorsement should be inferred.