Bank Restoration of Walton Creek
By
Robbin B. Sotir

The Walton High School is located in Cobb County, GA in the City of Marietta has a lovely little stream. In 2005, the stream on Walton High School property was showing little evidence of negative impact from storm water events, despite the fact it is located in an area bounded by the school buildings, athletic track, parking lots, neighborhoods, and streets. The water was clear and the stream had a well armored cobble stone bed. The stable stream banks were heavily vegetated with native ferns and mosses. The stream is located within the Sewel Mill Creek Basin and is part of the Chattahoochee Watershed. The STEM AP classes used it as an outdoor classroom monitoring the water quality in participation with Cobb County's Adopt-A-Stream program. Around 2011, a pair of beavers built a dam across the stream causing it to back up and pond, however it remained stable. The beavers were discovered by employees of the County, who quickly demolished the dam. The beavers left, but the formerly ponded area was now exposed. With every rainstorm the stream banks suffered severe erosion, sending tons of sediment pollution downstream. Sediment also deposited over the cobble stone bed, destroying habitat.

Due to the extensive and increasing erosional damage, loss of aesthetics and habitat degradation to the stream and stream banks, it was decided restoration would be beneficial. To achieve this a project-based learning assignment was developed for the ninth-grade STEM AP Environmental Science students to undertake this effort.

The 23, ninth grade STEM students are a part of Walton's new STEM Academy. They are a group concentrating on advanced math and science, and were accepted into the Academy based on their academic merit and other factors.

The students were assisted in this project by their teacher Dr. Sharon Camp and by Robbin B. Sotir and Alton P. Simms of Robbin B. Sotir & Associates, who are well-respected stream bank restoration specialists. As part of a volunteer effort, Ms. Sotir and Mr. Simms guided the students through the educational process including: site assessment, planning, design and construction implementation. The students were initially given a presentation by Ms. Sotir that outlined the reasons for and use of natural methods and procedures of stream bank restoration using soil bioengineering technology. The students took measurements of the stream, documented the area with photography and prepared a plan view and a set of cross sections with this gathered data. Next based on feasibility, location, and severity of the damage they decided on the best section to restore.

After the students selected an appropriate area to restore, the amount and type of materials were determined. Materials for the restoration were generously donated by RoLanka, including BioD-Mat 70 (woven bristle coir mat), BioD-SuperLogs (square coir log with invisible planting holes), twine and stakes. This is the first BioD-SuperLog demonstration as this is a new product line for RoLanka. Plant materials including willow and shrub dogwood were purchased from local nurseries. The Lowes in Kennesaw assisted in supporting the project by selling 3 gallon shrub dogwood at a dramatically reduced price.

Over a two-day weekend in March 2015, the students worked on the creek to construct the project. First, they installed the high left outside meandering bank with superlogs, these were anchored with stakes. Additional superlogs were placed on top of the first row, and shrub dogwood and willow

container plants and cuttings were installed between the two layers of superlogs to protect the bank by reducing near bank velocities. The BioD-Mat 70 woven bristle coir fabric was placed on the bank above and was planted with native ferns to control surface soil erosion. River rock was used to fill in a hole that had formed in the downstream area along the bank at the end of the superlog installation. Native ferns, irises, and cardinal flowers was installed on the opposite inside bank over the BioD-Mat 70 blanket to control erosion.

The students enjoyed themselves, worked hard and were very energetic restoring over eighty-five feet (85') of stream bank. The stream restoration project has been very successful. First it is doing a great job of protecting the stream banks from erosion. High storm water events are being properly channeled and bank erosion has stopped. The plants have grown and filled in much of the coir blanket and the area between the superlogs. Secondly, and perhaps more important this project has and will continue to teach these young adults the importance of caring for the environment and specifically urban streams.

Figure 1. Eroded and undercut streambank.

Figure 2. Students installing the natural coir products.

Figure 3. After successful installation.

Figure 4. Two months after installation.

Figure 5. Some of the ninth grade STEM students who participated in this project.