Gragston Creek Project

Gragston Creek is a typical rural stream in West Virginia. Several farms of varying sizes and management practices dot the landscape through which the stream meanders. It is not uncommon to drive the length of the small winding road and see farmers who are obviously committed to the conservation ethic; observing agricultural bmps like pasture division fencing, manure storage facilities and protected feeding areas. Despite these observations, the stream appears on the 303D list for biological impairment. With this being the case, agriculture along with other land use practices within the drainage must be considered as potential sources of impairment. The TMDL, scheduled for 2018, will identify the sources of impairment.

An obvious issue is the fragmented riparian corridor throughout the watershed. Although large segments of riparian vegetation exist along the stream, they are bisected by expansive reaches devoid of all woody, herbaceous growth. Consequently, Gragston Creek exhibits many of the apparent symptoms of a stream lacking a stable healthy riparian corridor; unstable entrenched channel, steep and in some cases sloughing streambanks.

The Murray farm is a rolling 120 acre cattle farm located along Gragston Creek just outside Prichard WV. Less Murray is the owner and operator of the farm and grazes 10 to 15 cattle on multiple fenced paddocks during the spring and summer months. During the winter, the cattle are kept in the pasture behind his home adjacent to the stream.

Over the years, the stream became an intimidating presence for this particular pasture. Riparian vegetation had been removed and the channel altered decades ago. The stream was slowly, methodically gobbling up ground at an outside bend in the stream.

A Bank Erosion Hazard Index Evaluation (BEHI) was conducted in the fall of 2010 to establish load potential in preparation for a project proposal. Calculations estimated a load of approximately 41 tons of sediment per year and a potential lateral movement measured in feet.

The project's ultimate goal was to improve water quality along Gragston Creek by achieving multiple objectives. The most obvious was to address the sediment contributions to the stream by stabilizing the failing banks. Additional objectives included restricting livestock access to the stream and establishing a healthy riparian zone.

To stabilize the streambanks, natural stream design techniques were employed. Two combination rock/log structures were constructed to manage the flow of the stream. Additionally, nearly 2,800 cubic yards of material were removed from the opposite bank. The excavation would allow the stream to access floodplain resulting in reduced peak flows and more natural stream flow characteristics; ultimately reducing erosion potential at the project site.

Establishing vegetation was and remains to be, a somewhat difficult step. A brush mattress was installed along the outside bend between the two in-stream structures. The project designer identified this portion of the project area as the most critical because of the energy that would be present during bankfull events. The brush mattress was constructed by driving 36 inch wooden stakes on a grid pattern at 4 foot centers. A mixture of black willow, sycamore and silver maple cuttings were then secured with 12 gauge wire tied in a diamond pattern. In addition to the brush mattress, a combination of willow, red osier, and silky dogwood live stakes were planted along the riparian area. The site has endured multiple bankfull events since construction finished in the fall. Despite a large portion of the live stakes lost to high water and the development of some erosion along the tow of the critical area, the project has succeeded in stabilizing the streambank. These issues will be addressed by the Conservation Specialist and landowner during the summer months.

The most critical aspect of the project involved convincing the landowner of the benefits of a healthy riparian area and the exclusion of livestock as part of the process. Flat pasture ground can be somewhat scarce in Wayne County. Convincing a landowner to devote even a fraction to riparian cover by exclusion is usually difficult. This was the topic of discussion from the beginning. Eventually the landowner saw the effort as a "trade off" between losing more ground from erosion or sacrificing a portion as riparian area. The landowner's realization is best summed up in his own words: "***Either way the creek is gonna take it. I might as well hold on to my ground...***" As a result, before the project began, the land owner agreed to erect 3 strands of high tensile electric fence along the stream to exclude livestock and allow for the establishment of riparian vegetation.

Projects of this nature are dynamic as the stream itself. Although construction ended several months ago, a small amount of tweaking was and is to be expected. Scouring and erosion along the log vane of the second structure will be addressed this summer as well as additional efforts for planting live stakes to replace those lost during the spring floods. In review, one can look at the entire project as a learning process for everyone involved. The project has achieved its purpose in stabilizing the failing streambank as well as reducing the sediment contributions. Additional benefits include the removal of livestock from this stretch of stream that will undoubtedly serve to reduce nutrient and fecal loading. Perhaps the biggest improvement is the change in attitude of the landowner who now advocates on behalf of the functionality and importance of riparian zones. Hopefully this is just the start…