

Mill Branch Stream Restoration Project Columbus County North Carolina

**CU: 03040206
SCO# 020611301A
EEP Project No. 251**



**3rd Year Monitoring Report
November 15, 2009**

Prepared for:



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Ecosystem Enhancement Program
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Prepared by:



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3.0 Executive Summary/Project Abstract

Project goals and objectives for the Mill Branch stream restoration project included:

- Improving water quality;
- Providing wildlife habitat through the creation of a riparian zone;
- Improving aquatic habitat with the use of natural material stabilization structures and a riparian buffer;
- Excluding cattle from the stream;
- Reducing nutrient loads from entering the stream via the buffer acting as a filter exclusion of cattle;
- Increasing the stream's access to its floodplain;
- Reducing erosion and sedimentation; and
- Protecting floral and biotic diversity via preservation.

Four (four) permanent vegetation plots were established and used in annual vegetation monitoring. Overall, the site is exceeding the minimum success requirements. As per the mitigation plan, the vegetative success criteria are based on the US Army Corps of Engineers Stream Mitigation Guidelines (USACE, 2003). The final vegetative success criteria will be the survival of 320 5-year old planted woody stems per acre at the end of the year 5 monitoring period. Monitoring for 2009 revealed that vegetation plots VP2 and VP3 fall below the minimum success requirements. Vegetation plots VP1 and VP4 meet or exceed minimum success requirements. Vegetation plot locations are identified in Appendix C.

Overall, the stream is functioning well and holding grade, however, the stream has areas of that are of concern. Channel dimension and pattern are similar to as-built conditions and currently meeting monitoring minimum success requirement thresholds. The channel profile appears to be holding grade and maintaining some bedform features. Since project construction, North Carolina has been in a moderate to severe drought. The drought has caused low flow periods resulting in vegetation growing within the stream channel. The vegetation has cause disruption of sediment transport resulting in aggradation on parts of the project.

Wetland restoration or enhancement was not a part of the East Tarboro Canal Stream Restoration Site therefore no wetland monitoring is required.

Summary information/data related to the occurrence of items such as beaver or encroachment and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the mitigation and restoration plan documents available on EEP's website. All raw data supporting the tables and figures in the appendices is available from EEP upon request.

4.0 Methodology

Vegetative sample plots were quantitatively monitored during the growing season. Four 100m² plots were established for site monitoring. Species composition, density, vigor and survival were all monitored. Each plot corner is permanently located with rebar. Year 3 vegetation monitoring was completed in October 2009 utilizing the Carolina Vegetation Survey (CVS) – EEP protocol Level 1 (version 4.1).

Stream monitoring was completed by utilizing total station survey along with Rosgen Level II techniques to determine stream stability and performance. The annual cross-sectional survey included points surveyed at all breaks in slope, including top of bank, bankfull, inner berm, edge of water, and thalweg, if the features were present. Longitudinal profile survey was conducted for the entire length of the restored channel for stream reaches. Measurements included thalweg, water surface, and bankfull. Existing onsite benchmarks were used for survey control.

Photo monitoring was conducted by walking each stream reach and taking photos at each predetermined photo point location using a digital camera.

5.0 References

Harrelson, C.C., C.L. Rawlins and J.P. Potyondy. 1994. Stream Channel Reference Sites: An Illustrated Guide to Field Technique. United States Department of Agriculture, Fort Collins, CO.

NCEEP. 2006. Content, Format and Data Requirements for EEP Monitoring Reports. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 1.2 November 16, 2006.

Rosgen, D. 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, CO.

6.0 Project Condition and Monitoring Data Appendices