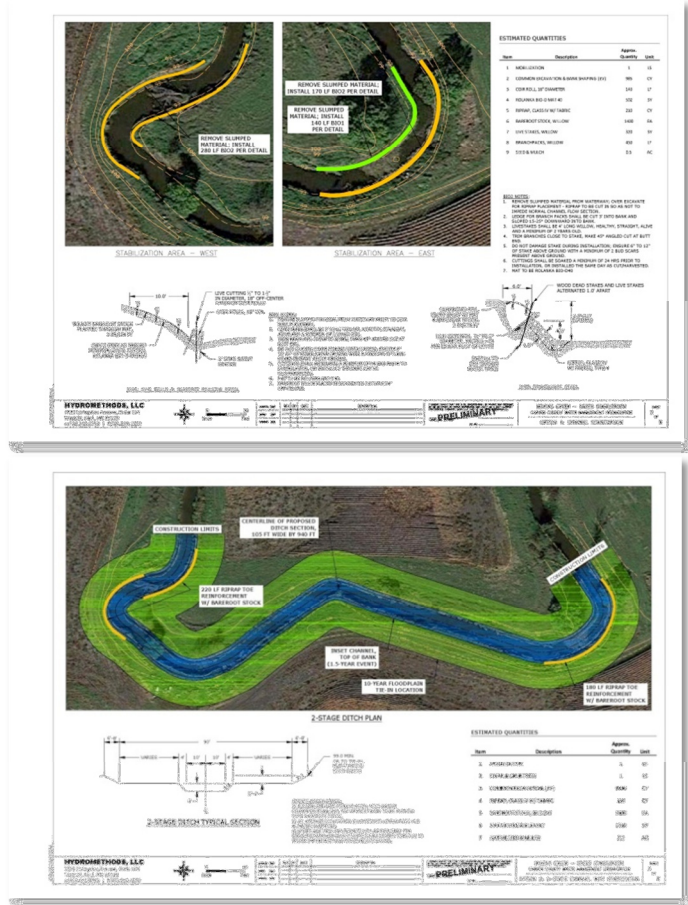


**PROJECT:** Bevens Creek Restoration (Carver County, 2012)  
**CLIENT:** Carver County Watershed Management Organization (CCWMO)

**CHALLENGE:** Ongoing erosion along Bevens Creek prompted the CCWMO to work in cooperation with a willing landowner to restore the stream banks along the targeted areas of the property. In addition to a stabilization plan consisting primarily of soil bioengineering methods, the CCWMO desired an alternative for a 2-stage channel section throughout the reach.

**SOLUTION:** Hydromethods performed a regression analysis to determine expected flows in the creek, and subsequently developed an XP-SWMM model to aid in the design of an ideal 2-stage section. The resulting channel would provide an inset low-flow region to convey the approximate bankfull discharge, while an overflow shelf would accommodate larger runoff events. Rehabilitating existing eroded areas and preventing future bank failures through the incorporation of vegetative stabilization methods was key. Soil bioengineering techniques were used in conjunction with traditional hard armoring to provide a robust restoration plan capable of protecting the banks with natural materials. A preliminary plan and cost estimate was developed for each option, and selection of the preferred rehabilitation method will be completed in 2013.



**Brush Layering/Branchpacking** Bioengineering Channel Stabilization Using Locally Sourced Materials

**Bank Treatment #2: Brush Layering/Branchpacking**

- Branchpacking and brush layering are used to repair, fill and stabilize small slumps or holes in streambanks, with roots developing and spreading throughout the bank.
- Effective for holes or slumps that range from 2' to 4' in height.
- Provides immediate soil reinforcement, retards runoff, and rapidly establishes vegetation.
- Cuttings should be 1/2" to 2" in diameter and protrude 6" to 18" from streambank.
- Constructed bench should slope downward into bank 15-25 degrees.
- Can be combined with live stakes or posts.
- Works well where toe has not been disturbed.
- With disturbed toe, reinforced protection should be provided (riprap or rootwads).

**Estimated Cost: \$35/Linear Foot**  
 This is an approximate installed cost. Actual cost will vary depending on material availability, site accessibility, and other project-specific details. Estimate does not include toe support (see roll \$30/ft, riprap w/fabric \$125/ft).

**References / For More Information**  
 Part 614, Stream Restoration Design, National Engineering Handbook, USDA ARS, 2007. Images for treated with branchpacking from EPA publications.

872

In addition to preparing preliminary construction documents for the targeted reach, Hydromethods developed general stream bank stabilization handouts for landowners. The Carver SWCD desired guidance materials describing soil bioengineering techniques to help landowners evaluate channel restoration options using inexpensive, readily available, locally-sourced materials. The cut-sheets provided technical notes and details, along with cost information, to allow landowners to consider bioengineering methods when planning for their restoration projects.