

Riprap Bank Protection

Riprap consists of blocky, angular rocks of different sizes and shapes. In a streambank stabilization job, the riprap is placed on the bank in such a way that the rocks are not segregated by size. Smaller rocks should chink in the void spaces between the larger rocks. When properly placed, each rock will be locked in to place by the surrounding rocks, creating a virtually solid, immovable object. To add further stability, the riprap should be keyed in to the bank and bed. A “core trench” of at least 2 feet deep should be dug in the streambed for the entire length of the project to act as a foundation for the structure. “Bank keys”, where the riprap is trenched in to the bank at an angle, should be installed at the upstream and downstream ends of the project to prevent flanking.

In Bradford County, the highly erosive nature of our soils and steep topography, combine with transportation, residential, and agricultural impacts to create notoriously unstable streams. In many cases, riprap bank protection is the only effective treatment to stabilize an eroding bank.



Stream Barbs

Stream Barbs can stabilize an eroding streambank by directing the flow away from the toe of the affected bank. They are made out of rock riprap and are installed pointing upstream. They have a gradual rise from the tip of the structure in the stream bed to where they intersect the bank. Often a series of Stream Barbs is installed along an eroding bank. They can be quite effective through a relatively straight stretch of stream, but should not be used in a tight meander. Bank protection is accomplished not by armoring, but by deflecting the flow away from the bank and forcing the fastest, deepest part of the stream in to the middle of the channel. During high water, if the barbs are functioning properly you'll notice slow or nearly still water along the bank.



Streamside Buffer

Often the most effective (and cheapest) way to stabilize a stream is to leave it alone. If erosion problems haven't reached a critical point yet, simply eliminating or limiting the impacts (livestock access, plowing, lawn maintenance, ATV activity, etc.) to a streambank and its surrounding area may allow it to heal itself. By allowing a strip of land along a stream to "go wild", you are giving sensitive seedlings a chance to get established and create root structure in the soil. Planting trees can kick start this process and allow control over the species growing along your creek.

Along with the stabilizing effect on the streambank, streamside trees and vegetation improve water quality. The shade cast on the stream by trees and shrubs keeps water temperatures down, thereby limiting algae growth and maintaining suitable habitat conditions for aquatic life. The vegetation along the stream intercepts and utilizes sediment and nutrients that would otherwise end up in the creek. The natural area created by a streamside buffer provides habitat for wildlife. While a view of the stream can be pretty, a hidden stream is usually healthier and more stable.





Cribbing

Cribbing functions as a stabilization practice as well as fish habitat enhancement. Cribbing consists of logs which are pinned together, that project out of a riprap placement. They are mounted parallel to the direction of stream flow and create a simulated undercut bank. The logs provide overhead cover and shade. Any stream angler knows that an undercut bank is a favorite hideout of big fish. This is why cribbing is sometimes referred to as a “lunker structure”.





Multi-Log Vane Deflectors.

Multi-Log Vane Deflectors function exactly like stream barbs. They stop erosion by slowing the flow down at the toe of the bank and effectively moving the fastest, deepest part of the stream towards the middle of the channel. A Multi-Log Vane Deflector usually consists of three logs which are pinned together with rebar to form a pyramid shape. They are installed pointing upstream with a gradual slope

from the tip in the streambed up to where the logs intersect the bank. At least a third of the logs must be keyed back in to the bank for stability. These can be a cost effective solution if logs are available on site. Trees that are naturally resistant to rotting (such as hemlock) are commonly used. The lifespan of these structures is limited, but can be extended if they can be installed so they stay wet year round. In Bradford County, with the late summer dry out many of our streams experience, this can be a challenge. But it's possible that the deflectors will stabilize the bank long enough for vegetation to become established providing a permanent solution.

