

# Restoring Montgomery County's Streams

## Stone Toe Protection

Stone installed at the base of the stream bank protects it from heavier storm flows and prevents undermining. The stream banks are graded back and planted with native vegetation for additional stabilization and erosion protection.



## Rock Pack and Flush Cut

Stream bank trees seriously undercut by erosive storm flows can be protected with supportive rock packing. If undercut too far, they can be "flush cut," which allows the roots to remain in the bank for stabilization and erosion protection.



## J Hook

Rock is placed in streams in the shape of a "J" to channel the flow of water away from eroding stream banks. The "hook" or curved tip of the "J" has slots which allow fast-flowing water through to dissipate energy and form scour pools, which add habitat.



## Cross Vane

Stone is carefully positioned at an angle to create a "vane" which diverts the flow of water toward the center of the stream, thereby protecting stream banks, maintaining stream bed elevation, and preventing further stream downcutting.



## Shallow Wetlands

Creation of a shallow wetland below a local stormdrain allows water quality treatment through infiltration, nutrient uptake, and limited detention. Shallow wetlands also provide habitat for balanced aquatic plant and animal communities.



## Coir Logs

Made from biodegradable coconut fibers, they provide a medium for vegetation, protecting less erosive stream reaches by holding the bank in place and catching eroding material.



Our stream restoration program uses a variety of techniques to stabilize stream banks, reestablish aquatic habitat, and prevent erosion and sediment pollution to our streams and watersheds. Restoration efforts generally employ natural materials such as rocks, logs, and native vegetation to reduce pressure on eroded banks and prevent down-cutting of the stream bed, in addition to stream buffer reforestation efforts, which provide long-term protection.

In areas with wide buffers, where the stream is farther away from property lines, "softer" techniques and natural materials are used, which often help restore the meander pattern found in stable streams. Urbanized areas, with development closer to the stream, may require "harder" engineered solutions.



## Imbricated Rip Rap

Overlapping stones help protect stream banks from erosion or potential failure. Typically used along stream reaches where eroding stream banks threaten private property or public infrastructure, or where the stream is highly confined and subject to particularly erosive storm flows.

## Log Vane

Logs are placed and anchored to divert stream flow away from eroding stream banks towards the center of the stream. The concentrated stream current forms scour pools below the vane, adding pool habitat. Vanes can also be constructed with rock.

## Step Pools

Used downstream in areas where rock—often added to protect a sewer crossing—has raised the level of the stream, or in other areas where the stream drops steeply. Step pools allow stream flow to lose erosive energy by gradually lowering the elevation of a stream in a series of steps.

## Brush Layering

Layers of live branch cuttings are installed horizontally. These cuttings will sprout new plants which will then stabilize eroded stream bank slopes.

## Root Wads

Tree trunks with attached roots are anchored in stream banks to provide cover for fish, amphibians, and aquatic insects. The sinuous root mass slows the flow of the stream, armors the bank, deflects energy away from the bank, and forms scour pools, providing greater habitat benefits.