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Streambank Management 201:

Grading and Structure Method

DRAFT

Eroding streambanks are a common issue along urban rivers in southeast Michigan. Although some erosion is part of normal processes in a river system, accelerated bank erosion is occurring in urban rivers as result of land use change that causes increased river flow. Studies have shown that properly managed streambanks can help reduce erosion, provide habitat for fish and wildlife and are an important part of a river system's natural processes. Experts recommend using native vegetation and their extensive root mass to reduce the impact of erosive river flows. Streambank Management is a way to hold streambank soil in place. The Grading and Structure Method of Streambank Management has been specifically developed to give guidance on how to identify and evaluate a streambank, stabilize the soil and minimize bank erosion. Streambank Management 201 is designed to be part of a larger riparian corridor management plan.

Grading and Structure Method

1. IDENTIFY - Determine if the site meets the 201 criteria (See Criteria on Page 2). If yes, go to step 2.
2. EVALUATE - Determine project location, rate of erosion, soil moisture, amount of sunlight available, and desired plants.
3. PLAN - Address safety concerns, define point of access to bank, determine depth of water and consider water flow.
4. PREPARE - Select technique, develop materials and plant list, purchase plants (and seeds) and prepare project area (grade site).
5. INSTALL - Install appropriate stabilization technique.
6. DEFINE - Define the boundaries of project area using signage, fences, logs or other material to prevent area from being impacted.
7. MAINTAIN - Water planted materials as needed throughout first year or until established. Keep invasives and unplanned materials out of planted area.
8. MONITOR - Observe the streambank and adjacent planting area, watching for additional erosion or impact to planting area.

Benefits

1. Creates, preserves and enhances fish, aquatic invertebrate and wildlife habitat.
2. Reduces localized erosion while maintaining runoff reduction benefits.
3. Increases and/or maintains the river's aesthetic value.
4. Creates habitat and meets other requirements of the Michigan General Stormwater permit.
5. Saves money by eliminating the need to use heavy machinery and extensive restorative work.
6. Can involve multiple volunteers and activities can be done by hand.
7. Provides an increased level of management for an eroding slope.

Permit Requirements

1. Requires a Michigan Department of Environmental Quality Inland Lakes and Streams Permit
2. Requires limited grading and earthwork, limiting the impact to the riparian area.

201 Techniques

Some techniques that could be applied to a 201 criteria streambank are...

- Native Plantings
- Live Stakes
- Live Fascines
- Live Geogrid
- Coir Log toe protection
- Limited stone toe protection

Homeowner/Volunteer Activities

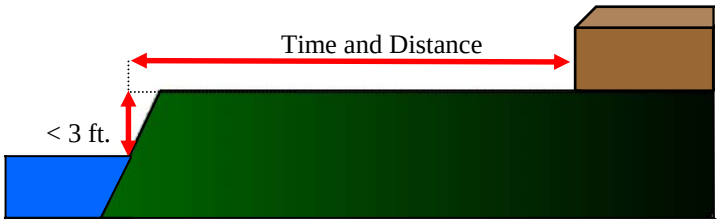
Some activities for homeowners/volunteers include:

- Soil preparation using herbicide and roto-tilling
- Soil preparation using newspaper and black plastic
- Trash removal teams for man-made materials in stream, on floodplain or riparian corridor
- Hand grading of project area
- Planting trees, shrubs, plugs and spreading seed
- Watering the newly planted materials during the first year.
- Weeding and maintaining the planted area, keeping it free from invasives and unwanted plants

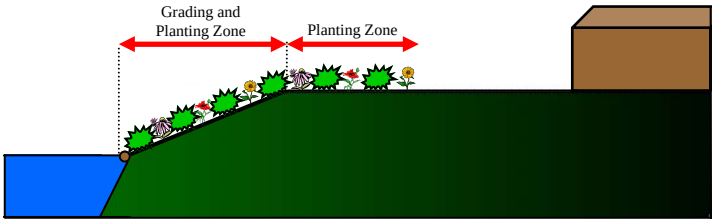
Grading and Structure Method Criteria

The Grading and Structure Method for streambank management can be used if the site location meets the following criteria…

1. The height of the bank from the toe of the slope to top of bank is less than three feet.
2. The angle of the slope is close to 45°, or can be easily hand graded to 45° or less.
3. The rate of erosion is moderate and there is distance between top of bank and a potential impact to a structure (Time and Distance).
4. There is no exposed infrastructure (example - sewer line), impacted building or structure or reasonable threat to safety.
5. There is limited root mass on or adjacent to the streambank.



Before planting

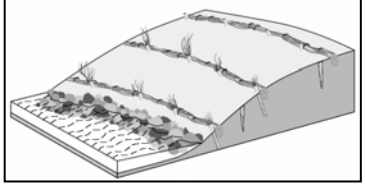


After planting

If the erosion is not occurring at a high rate and there is distance between the top of bank and the nearest unmovable structure, then there is the ability to use plantings to create root mass to strengthen the stability of the soil. The more roots, the more slope stability. Plant materials on the bank as well as between the bank and the rest of the property. This will establish stronger soil stability. In smaller streams with small bank heights, providing increased root mass will stabilize the bank.

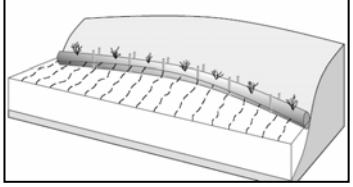
Example Grading and Structure Method Techniques

Live Fascines



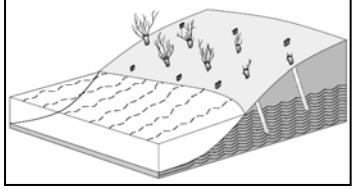
Dormant branch cuttings bound together into long sausage-like, cylindrical bundles and placed in shallow trenches on slopes to reduce erosion and shallow sliding.

Coconut Fiber Roll



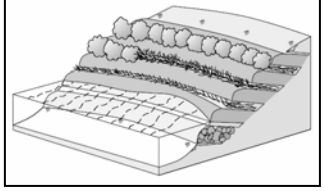
Cylindrical structures composed of coconut husk fibers bound together with twine woven from coconut material to protect slopes from erosion while trapping sediment which encourages plant growth within the fiber roll.

Live Stakes



Live, woody cuttings which are tamped into the soil to root, grow and create a living root mat that stabilizes the soil by reinforcing and binding soil particles together, and by extracting excess soil moisture.

Vegetated Geogrids



Alternating layers of live branch cuttings and compacted soil with natural or synthetic geotextile materials wrapped around each soil lift to rebuild and vegetate eroded streambanks.

For more information about streambank stabilization techniques, please visit the USDA website for the *Stream Corridor Restoration: Principals, Processes and Practices* guidebook at **http://www.usda.gov/stream_restoration.**

Who can provide assistance?

Your local community has information and staff that are ready to assist you in your planting project. In addition to your community, the Riparian Corridor Management Work Group involves individuals, communities and community groups in protecting riparian corridors in Southeastern Michigan. By participating in this program, you will learn about riparian corridors and their importance to our urban/suburban environment. For more information call Wayne County Department of Environment at (888) 223-2363 or Friends of the Rouge at (313) 792-9621 for more information.

Grading and Structure Method: Streambank Management 201

Developed by the Riparian Corridor Management Technical Advisory Committee, which was made possible by a partnership between Friends of the Rouge, the Rouge River Advisory Council's Habitat Committee, the Michigan Department of Environmental Quality and the Wayne County Department of Environment. For more information, please contact Friends of the Rouge at (313) 792 - 9621, U of M - Dearborn, 4901 Evergreen Road - 220 ASC, Dearborn, Michigan 48128.