

What causes urban streambank erosion?

Streambank erosion is a natural process that occurs in all streams as water wears away the soil and rock that form their banks. As the banks are worn away, the streams naturally and slowly change their courses and meander.

This process accelerates at an alarming rate as drainage ditches, straightened streams, and storm sewers all route water more efficiently into local streams. This increases their flows, speed, and velocity, particularly after heavy storms.

Moreover, as more and more impervious, paved surfaces are constructed, such as shopping malls, parking lots, and roads, rainwater can no longer percolate into the ground naturally. Instead, rainfall becomes surface water runoff, which also eventually reaches local streams and enlarges their flows.

Many wooded segments of suburban streams have been invaded by non-native species that aren't well suited to the streambank. Their shallow root systems are easily undercut by the action of fast-flowing streams.



Only native plant species are used along restored streambanks, appropriate to the environment. They are carefully selected according to local conditions, so that they are hardy and require little maintenance.



Concerned about erosion on your property?

Here's what you can do to get a handle on the problem:

- Identify the erosion site on your property.
- Assess the potential for more damage and loss to the property if erosion continues.
- Obtain more information on bioengineering techniques by contacting:

The Illinois State Water Survey
(309) 671-3196

The DuPage County
Department of Environmental Concerns
(708) 682-7130

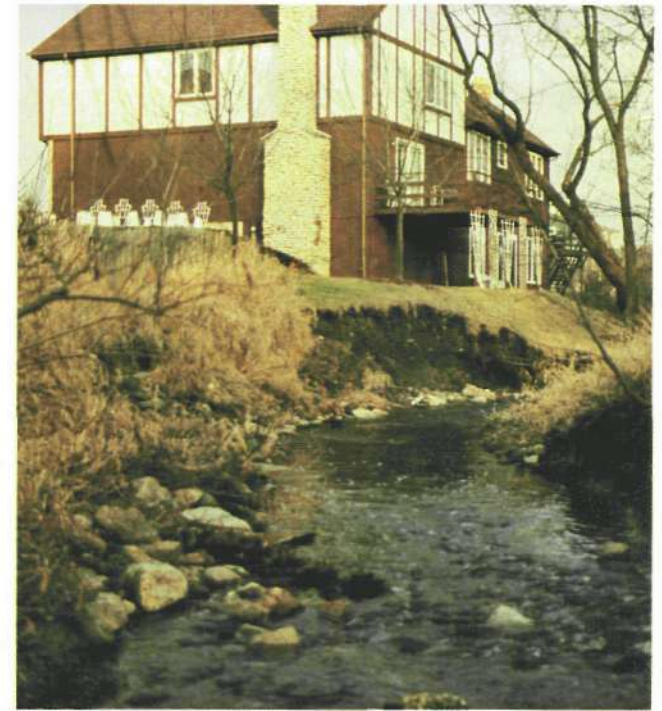


Printed by authority of the State of Illinois
and produced by the Illinois State Water Survey
as part of a streambank stabilization
educational unit.

Illinois State Water Survey
Miscellaneous Publication 149

Printed on recycled paper using soy ink.
15M-83378-93
3M-86497-10/94

Streambank Erosion



Don't Let It Destroy Your Property!

Streambank erosion is becoming a major problem for many suburban homeowners as backyards are washed away and homes are threatened by small neighborhood creeks gone wild.

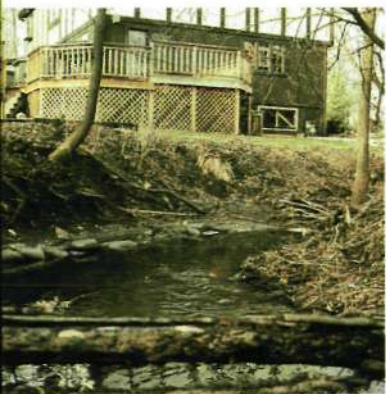
The DuPage County Department of Environmental Concerns and the Illinois Environmental Protection Agency are examining bioengineering techniques to control erosion and stabilize streambanks. These techniques, developed by the Illinois State Water Survey, are ecologically safe and economically sound. They can preserve your property and enhance the natural environment.

How does bioengineering relate to streambank erosion?

Bioengineering employs the use of engineering techniques along with biological expertise to control the erosion of streambanks. Engineering considerations include the hydraulics of the flow and the structural integrity of the banks. Biological considerations include the vegetation that keeps banks stable.

The techniques discussed here were designed specifically to reduce erosion of valuable property and maintain a more natural stream without increasing flow or velocity. Based on trials on rural streams in downstate Illinois, these techniques involve the introduction of stabilizing structures along with native vegetation. They have been effective in residential and park settings in DuPage and Lake Counties.

Solving the problem in DuPage County



These DuPage County homeowners purchased their property for its idyllic setting and picturesque stream. But they soon learned that spring and fall rains changed the stream: it roared through their yard, pummeling the streambanks and wearing them away. With the banks gone the streamside vegetation and then the yard.



When their home was threatened, they knew the stream had to be controlled. They contacted the DuPage County Department of Environmental Concerns, which initiated a demonstration project using bioengineering techniques, thus protecting the streambank and their home.

How does streambank stabilization work?

Traditional bank stabilization measures include concrete lining, timber retaining walls, and shoreline reinforcements of broken concrete. The costs of these measures are great and far-reaching. The natural beauty of the stream is lost, water quality deteriorates as it flows through unnatural materials, and flows are accelerated in the absence of natural meanders and obstructions. Often these measures create additional problems downstream, including increased flooding and more erosion.

Bioengineering techniques, combining man-made structures with natural vegetation, are a logical alternative, protecting both the stream's natural beauty and valuable properties alongside.

Two types of structures are installed at the toe of eroding banks: "lunkers" and "a-jacks." They provide an aquatic habitat below water and stabilize the base of the bank. Imbedded among the structures are dormant willow posts, fast-rooting trees whose natural habitat is at the water's edge. Their roots bind and strengthen the banks as they grow. Finally, banks are sloped, contoured, and planted with other water-loving vegetation.



After the streambed is shaped during a period of low flow, two types of man-made structures may be placed at the toe of the eroded bank. "Lunkers," which resemble pallets, are wooden or artificial "eco-wood" structures made from recycled plastics. "A-jacks" are concrete structures that are interlocked at installation.



Following installation of lunkers or a-jacks, rock and dormant willow posts are worked into the structures. The bank is then sloped, and grasses and various kinds of vegetation are planted.

The advantages are both economic and environmental.

- **LoW-COSt materials and installation.** The DuPage County Department of Environmental Concerns funded this project at a cost of \$150,000, which included materials and labor. Extension of a concrete channel through the one-mile reach would have cost more than \$1 million!
- **Environmentally SOUNd and aesthetically pleasing.** Native vegetation provides natural habitat around the stream, which is much more attractive than a concrete channel in a backyard.
- **Self-SUSTaining.** The natural and native species are self-sustaining. Because their preferred environments are at water's edge, they do not spread upward into yards or clog channels.
- **Tested and proved effective in Illinois.** Streambanks stabilized with these methods have withstood heavy spring floods and other severe conditions.
- **Valuable native plant Species return.** As erosion slows, trees and other appropriate vegetation can grow.
- **Minimal construction inconveniences.** Restoration involves a small work crew and specialized equipment and machines that limit damage to surrounding property.