



OHIO STREAM MANAGEMENT GUIDE

Demonstration at Gwynne Conservation Area

A Stream Management Model

Guide No. 09

The character of Ohio's rivers, lakes, and streams has changed greatly over the past three centuries, since the state's earliest pioneer settlements. Each year, in both agricultural and urban settings, precious soil is lost to erosion. The result is increasingly costly damage to our waterways and other natural resources.

Over the past several years, the Ohio Department of Natural Resources and The Ohio State University have developed a 35-acre demonstration site to illustrate some of the most effective practices used to solve streambank erosion. The Gwynne Conservation Area, named after the previous land owners, is located at the Farm Science Review in Madison County. This site features a variety of natural and constructed stream management practices along the banks of Deer Creek. The demonstration site offers dramatic comparisons between traditional and nontraditional stream restoration techniques.

Major features of the demonstration site include:

Stream Corridor

From the observation tower, the entire stream corridor is visible, although Deer Creek itself may be hidden behind the tree cover. Notice the setback which separates the stream corridor from farming, mowing and other land use activities. Due to the threat of flooding, it is recommended to avoid development in the floodplain area. The resulting permanent vegetation (grass, shrubs and trees) is one of the best means for bank protection. This vegetation provides several benefits: a filter strip which cleans sediment and nutrients from water runoff; shade to keep the water cool and increase oxygen content; food for aquatic wildlife; and habitat for many upland wildlife species.

Wetland

A 3.2 acre wetland area can also be seen from the observation tower. Constructed in 1989, this area demonstrates the ways in which wetlands may be built

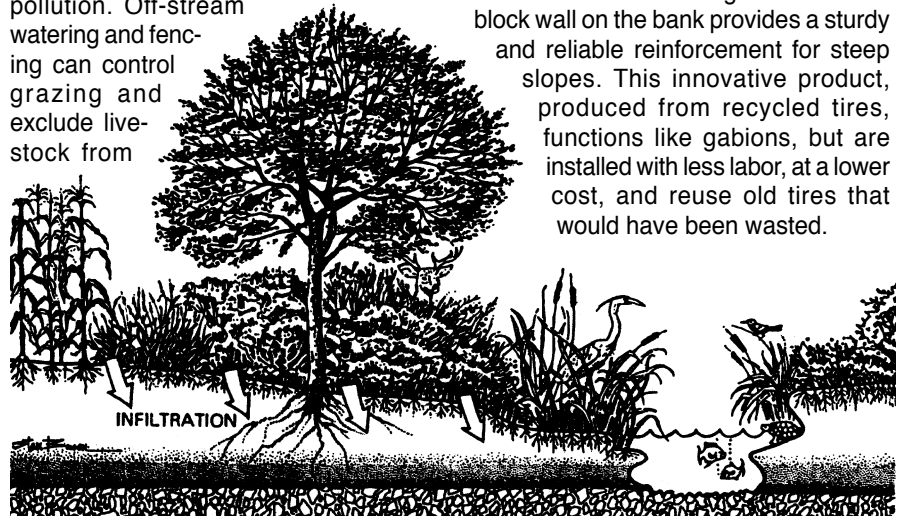
on farmland to serve as habitat for water fowl, provide food for upland wildlife and offer an effective filter for pollutants from runoff and water discharge. The wetland's average depth is two feet and is typically found in low-lying areas.

Stream Tree Planting

The forested area next to Deer Creek serves important water quality functions. The tree roots hold the soil in place, keeping the stream from "wandering", eroding the streambank and consuming crop field or pasture. Trees also serve as a filter for sediment and pollutants from water runoff.

Livestock Watering Areas

Uncontrolled livestock access to streams can result in bank erosion, damage streamside vegetation and degrade water quality with solid waste pollution. Off-stream watering and fencing can control grazing and exclude livestock from



stream channels. Furthermore, good off-stream watering practices can facilitate rotational grazing, reduce livestock injuries and increase production. A typical livestock watering tank, which is fed from an existing pond, costs between \$300-\$500. Government cost-sharing is often available for this purpose.

BANK PROTECTION - SITE 1

Site 1 provides a streambank protection demonstration which compares eight techniques to help prevent erosion.

Tree Revetment or Kicker— By placing and securing a tree deflector on the stream's bank, this practice reduces erosion by deflecting high-velocity water away from the eroding streambank while allowing natural stream sedimentation to fill in the eroded area. Trees in the water also add fish habitat.

Gabions—Through this approach, wire baskets are filled with rocks then stacked into the streambank to stabilize steep banks and provide erosion control protection from high velocity water. Although labor intensive and somewhat unsightly, gabions work well in urban areas where little excavation is possible and low risk protection is needed.

Multi-Bloc— Placing a rubber-latex block wall on the bank provides a sturdy and reliable reinforcement for steep slopes. This innovative product, produced from recycled tires, functions like gabions, but are installed with less labor, at a lower cost, and reuse old tires that would have been wasted.

Rock Rip Rap—This traditional bank protection approach places rock, typically measuring eighteen inches in depth, on the bank's slope to keep banks in place and to deflect water away from the eroded section of the streambank.

Dormant Willow Post—Willow posts (5-6 feet long and 2-4 inches in diameter) were cut and driven into the eroding bank. These posts have rooted

and sprouted new growth to stabilize the bank and form a dense vegetative barrier against erosion. This low-cost method also provides shade and habitat for fish and wild-life.

Dwarf Willow—Two varieties of Dwarf Willow, Bankers Willow and Streamco Willow, offer excellent erosion control. The result is a fast growing erosion control technique without the threat of breakage causing logjams. This practice is best used on relatively small streams or ditches, with lower velocity stream flow.

Native Vegetation—Most streambanks are best protected by leaving the native vegetation on the berm or top of the bank alone. Native trees, shrubs and grasses will form a protective barrier of roots for controlling bank erosion as the leaves serve as protection from rainfall.

Grassed Slope—Streambanks are typically excavated to a 1:2 side slope on non-erosive soils. The slopes are then seeded, fertilized and mulched to an erosion resistant grass like Kentucky31 Tall Fescue.

BANK PROTECTION - SITE 2

In the years ahead, Site 2 will stop bank erosion by using instream and streambank deflectors to redirect water flow away from an eroding bank and back into the center of the stream's channel. Through the use of Instream Stone Flow Deflectors, rocks or logs are placed along the streambank to deflect the flow of water away from the eroding bank, allowing it to stabilize naturally by the settlement of suspended sediments. Tree kickers also serve the same purpose.

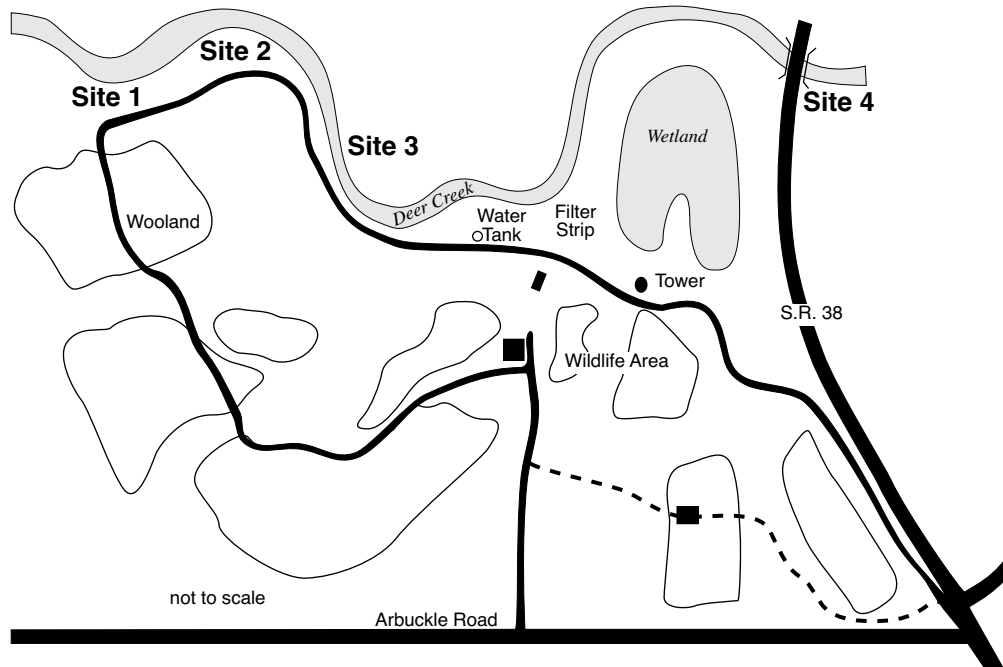
BANK PROTECTION - SITE 3

On severely eroded banks, sometimes a combination of bank protection techniques are needed to stabilize and restore the streambank. For example, the bank's vertical slope must be pulled back in order for willow posts to be planted. Planting trees on the berm further stabilizes the banks.

BANK PROTECTION - SITE 4

This proposed site will focus on vegetative streambank protection research by constructing a new conservation practice each year. Research conducted

Farm Science Review Gwynne Conservation Area Streambank Erosion Demo Site Locations



at this site will include the experimentation with planting dormant cuttings such as Cottonwood, Green Ash or Dogwood next to willow. Other instream and bank practices will also be used.

As stewards of Ohio's natural resources we must all take an active role in helping preserve and protect Ohio's rivers, lakes and streams. If you are interested in learning more about the streambank management practices demonstrated at the Gwynne Conservation Area, please contact your county Soil and Water Conservation District V Soil Conservation Service office. Additional information can also be obtained through the Ohio Department of Natural Resources (ODNR) Divisions of Soil and Water Conservation, Water, Wildlife, Forestry, or Natural Areas and Preserves, Fountain Square, Columbus, Ohio, 43224, or by calling (614) 265-6585.



This Guide is one of a series of Ohio Stream Management Guides covering a variety of watershed and stream management issues and methods of addressing stream related problems. The overview Guides listed below, are intended to give the reader an understanding of the functions and values of streams. For more information about stream management programs, issues and methodologies, see Guide 05 Index of Titles or call the ODNR Division of Soil and Water Resources at

614/265-6739. All Guides are available from the Ohio Department of Natural Resources. Single copies are available free of charge and may be reproduced. Please contact:

ODNR
Division of Soil and Water Resources
2045 Morse Road, Bldg B
Columbus, Ohio 43229-6693

The guides are also available on-line as web pages and PDF files so you may print high quality originals at your location. You will find the guides on-line at:

<http://www.ohiodnr.gov/soilandwater/>

Prepared by the Ohio Department of Natural Resources, Jim Lynch, Division of Media Relations, principal author. Input from staff of several ODNR divisions, state and federal agencies are used in the development of the Ohio Stream Management Guides.

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