

Classic Stream Problems; New Stream Solutions

Missouri Department of Conservation



Landowners living along streams reap many benefits; however, they also face a number of problems. Flooding, stream bank erosion, field erosion, siltation and other problems make it seem as if the stream is picking on each landowner. It almost seems like a battle with each side making moves and counter moves. In a last ditch effort to gain control, the landowner straightens the stream channel to make the water flow straight, fast and away from his property. The battle is over; the landowner won...or did he?

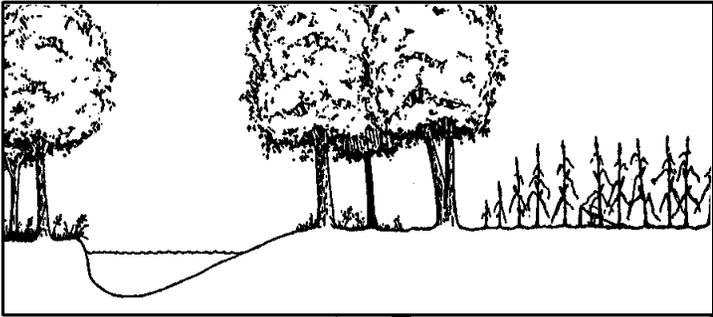
As a landowner, you know that for every action there is a reaction. Add fertilizer to a stand of grass and you increase forage production; too much fertilizer will burn it up. Dealing with stream problems is similar. The right amount of stream work will yield benefits; too much will cause problems. Stream straightening is almost always too much, and can increase farm costs. Channel straightening increases erosion of valuable farmland, worsens gully erosion in bottomland fields, and lowers groundwater levels. Such events can cause water supply problems during droughts, create problems for upstream and downstream neighbors, and ruin good fishing spots.

Channel Changes and Stream Health

Channel straightening replaces a winding stream with a shorter, straighter channel. The new channel has a steeper slope because water makes the same elevation drop over a shorter distance. After straightening the stream, the stream must adjust to these abrupt elevation changes. Water begins to flow faster causing the banks and bottom to erode. The stream bottom erodes upstream while deposition occurs downstream. As a result, streamside landowners are usually faced with more problems than they started with.

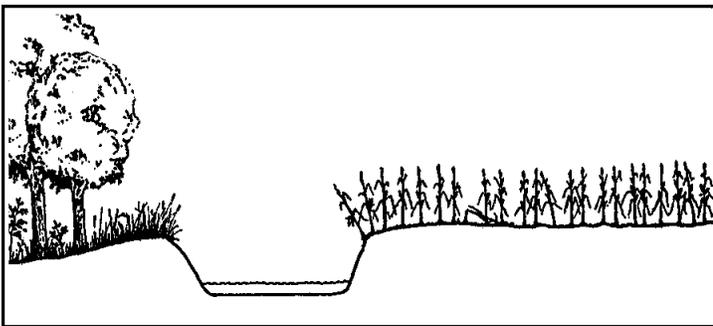
Erosion of Farmland —Erosion is, and perhaps always will be, a problem for landowners; however, stream straightening makes soil erosion worse. The faster moving water of a straightened channel has more force and causes more stream bank and bottom erosion. The stream widens over time as banks erode and valuable farmland and crops can fall into the stream. This soil can be washed downstream and deposited in the stream channel or on adjacent land, resulting in losses to agricultural production. As the stream bed erodes, gullies entering the stream become longer and deeper. Good, productive soil disappears.

Unstraightened Stream



An unstraightened stream with wooded corridors will allow more land to be cultivated in the future, since little soil is lost annually to erosion.

Straightened Stream



A straightened stream with unprotected banks allows for excessive soil erosion. Valuable crops and farmland are lost annually and increased sedimentation occurs in the stream channel.

Reduced Water Supply — The undesirable changes associated with channel straightening (increased velocities and stream bed erosion) can lower the groundwater table in some areas, especially during droughts. This can reduce water supplies that some landowners and wildlife rely on.

Increased Flooding — Flooding is a natural occurrence along streams, but channel straightening forces flood waters to be dumped faster on downstream neighbors. Neighboring farms, fields, roads, bridges, and other structures can be seriously affected by aggravated flooding and erosion.

Poor Water Quality — The soil that erodes contributes to water quality problems. Increases in silt loads and nutrients, changes in water temperature and dissolved oxygen, and increases in contaminants attached to soil particles are all aggravated by channel straightening.

Unsuccessful Fishing and Hunting — As an angler or hunter, you know that in order to find the catfish or deer you pursue, you must look in an area with the correct habitat. Channel straightening destroys habitat in several ways. Within the stream, sediments smother fish eggs and cover food producing areas. Also, the new channel has a uniform width and depth. Riffles, deep pools, undercut banks and instream cover fish use as homes are eliminated. Streamside homes for deer, turkey, squirrels, otters, and other wildlife are also destroyed when trees and shrubs are cleared from the banks of the new channel.

What Can You Do?

There's no doubt about it; streams can cause problems for landowners. It's important to determine what is causing stream problems before trying to solve them. Just as a doctor must find out what is ailing his patient before prescribing medication, determining the cause of a stream problem is necessary before applying a solution. Channel straightening is rarely a solution to most of the common problems streamside landowners face, but here are some solutions that usually work well.

Practice soil and water conservation on your farm. Many stream problems are caused by sediment choking the stream channel or by runoff that's too excessive for the channel to carry. Soil conservation practices (terraces, strip-cropping, etc.) and gully stabilization structures will decrease sedimentation, delay runoff and reduce the damages that excess water and sediment create. See your local Natural Resource Conservation Service office for more information on soil conservation practices.

Consider selective debris removal. Stream bank erosion problems are often caused as water is directed into the bank by debris lodged in the channel. Selectively removing problem debris can eliminate obstructions. Be careful to remove only the problem obstructions; removing all in-channel structures will result in fish leaving the area. Contact your nearest Missouri Department of Conservation Regional office for help in identifying obstructions that should and should not be removed.

Use bank stabilization methods. When stream bank erosion problems are not caused by obstructions, a structural approach may be needed. Bank protection measures such as riprapping with large rocks on eroding areas, or anchoring trees along stream banks can minimize the problem. Inexpensive techniques, such as tree revetments, can help prevent a big problem if you start early. An eroded bank on a straightened stream can rarely be repaired cheaply.



Maintain streamside vegetation. Often, stream problems result from clearing streamside trees. Maintaining an adequate stand of streamside vegetation can often prevent erosion problems. A timbered corridor of 100 feet on each side of the stream has been shown to stabilize a stream's channel and banks in most instances. The root systems of trees growing near the water's edge bind the soil together to control bank erosion. A wide corridor of trees will ensure that banks are protected even when unusual flooding removes some streamside trees. These trees also slow flood waters which cause soil and sand to be dropped before reaching bottomland fields.

How Do I Get Help?

Correcting stream problems is not easy, but there is some help available.

Request technical assistance. Contact your local Missouri Department of Conservation Regional office or your local Natural Resource Conservation Service office. These agencies may be able to provide technical assistance or advice regarding your project. Severe problems on large or straightened streams usually require the technical services of a certified engineer.

Obtain necessary permits. Correcting stream problems often requires approval of local, state, or federal agencies. Contact your local Missouri Department of Conservation Regional office for recommendations on applying for permits.

You are important to Missouri's stream health. The decisions you make regarding stream management on your property go beyond your property lines. Stream straightening is a practice that was used frequently in the past, but less frequently today. Landowners have seen many of the problems caused by previous stream straightening. Through many years of study, we are now aware of successful alternatives to this procedure. By learning to work with streams and not against them, we can begin to better attack problems and appreciate the benefits streams provide. If we target our problem solving to the causes and avoid stream straightening, we'll reduce stream problems for many years to come.

For more information contact your local Missouri Department of Conservation Regional office.