

THE BENEFITS OF WELL-MANAGED STREAM CORRIDORS

SCOTT CRAVEN, GARY JACKSON,
WILLIAM SWENSON AND BRUCE WEBENDORFER



The lands that border thousands of streams in Wisconsin contain unique and valuable qualities. These border lands – called riparian areas – play a critical role in protecting water quality, soil, fish and wildlife. Vegetation in these areas filters sediment, nutrients and toxic chemicals that storm water and melting snow carry toward streams. Natural stream corridors also are ecologically very rich. They provide outstanding habitat for game fish and wildlife. For owners of the land and visitors, riparian areas provide a place to fish, hunt, canoe, observe nature or just loaf – away from the sights and sounds of civilization.

In Wisconsin, urban and agricultural expansion has often damaged stream corridors. In rural areas stream corridor protection and maintenance depend on the voluntary actions of landowners. Although most landowners and farmers support conservation efforts, time and money are often in short supply on today's farms. This publication describes the benefits of protecting rural stream corridors and explains how landowners, volunteer groups and government agencies can cooperate to protect lands that border streams.

Two farming practices that reduce a stream corridor's conservation value are allowing cattle free access to streams and planting crops close to banks and shorelines. Cattle break down the banks, trample vegetation and add manure directly to the water. Cropping removes the natural vegetation and increases runoff of sediment, fertilizer and pesticides into streams.

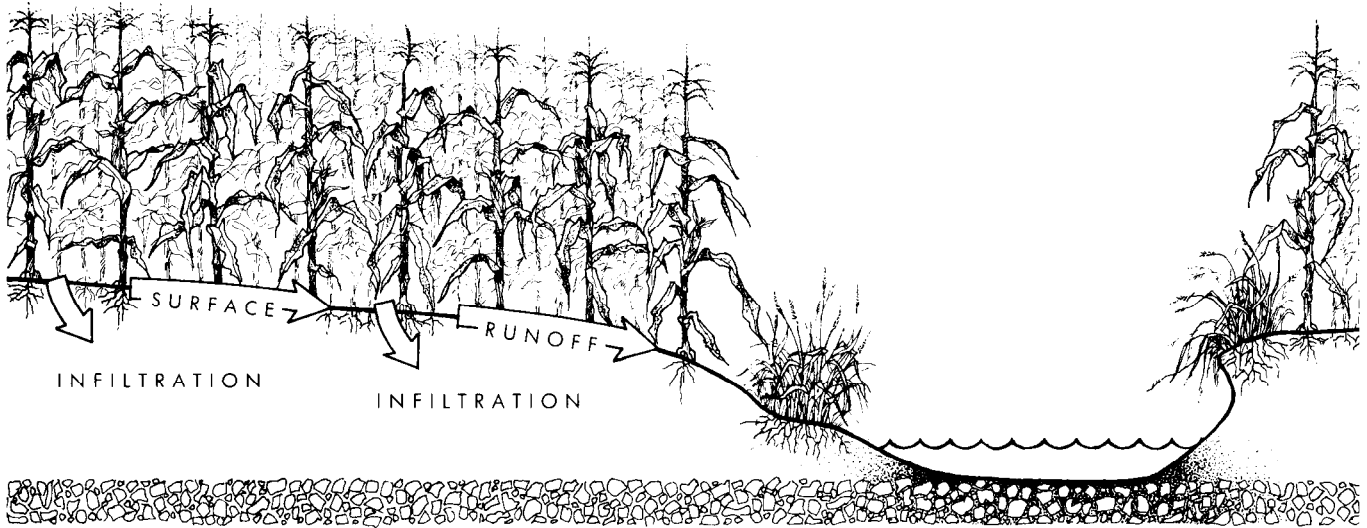
Working together, landowners and volunteers can make the difference between a stream corridor stripped of vegetation – with the stream banks crumbling into the water – and an attractive corridor alive with the sights and sounds of wildlife.

Although this bulletin focuses on stream corridors, many of the ideas presented here apply to areas adjacent to lakes, ponds and wetlands.

EROSION AND WATER QUALITY

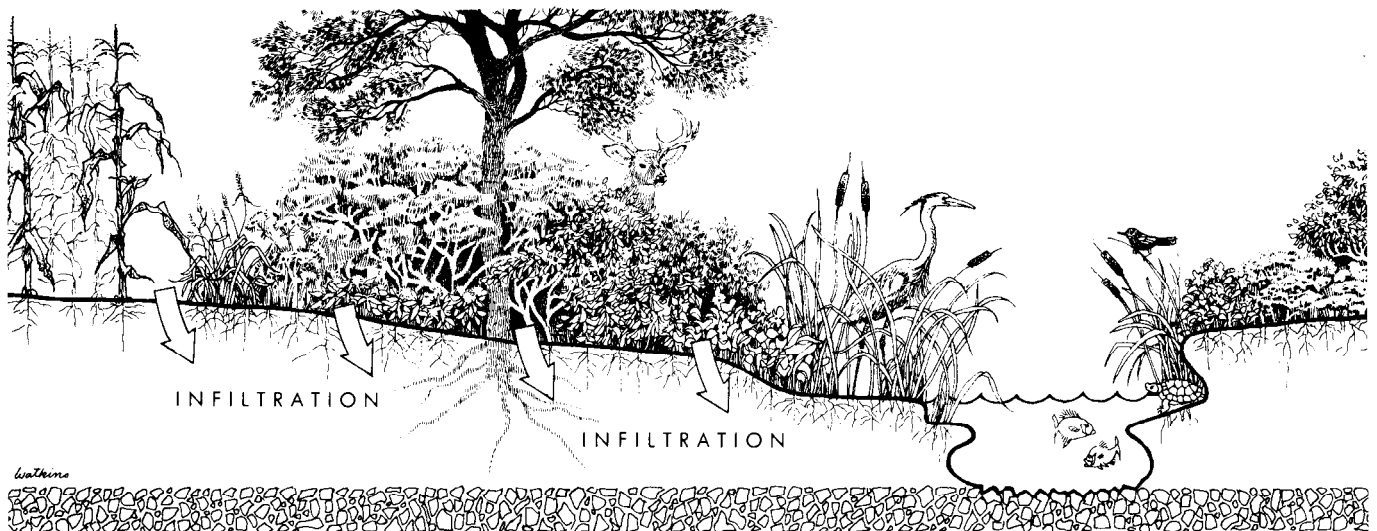
When cattle, tillage or construction destroy vegetation along a stream, erosion is unavoidable. Rainfall washes soil from upland areas into the stream, and the stream erodes its banks, which are no longer held together by plant roots. Streambanks slump as the stream undercuts them, accelerating erosion. These processes pollute the stream and cause significant loss of soil from adjacent farmland. Even small creeks may experience major erosion and water quality problems, particularly during spring.

The vegetation along a protected stream corridor also reduces the speed of overland runoff water as it nears the stream. A slower flow not only helps stop soil erosion, but causes sand and other large particles from upland areas to be deposited along stream banks, not in streams. Vegetation also traps leaves, other debris and nutrients that runoff and wind would otherwise carry into the stream.



Two panels showing a stream and adjacent bank before and after improvement. The TOP PANEL shows a corn field planted up to the stream bank. Cropland runoff carries soil from fields directly to the stream. The streambanks are unprotected and actively eroding. This situation produces a warm, shallow, silted stream with limited fish life.

The BOTTOM PANEL shows the same area 10 years later. The field has been set back. Vegetation between the field and stream protects water quality by reducing runoff and siltation and filtering potential chemical pollutants. The stream is narrower, deeper, cooler and supports greater numbers and types of fish. The streamside vegetation also provides wildlife habitat.



Reducing the amount of sediment, organic matter and chemicals that flows into streams is important. These pollutants reduce light and oxygen in streams, and increase water temperature; these changes make streams less suitable for fish such as trout, bass, other game fish and for the organisms these fish eat.

STREAM CHANNEL AND FISHERY IMPROVEMENTS

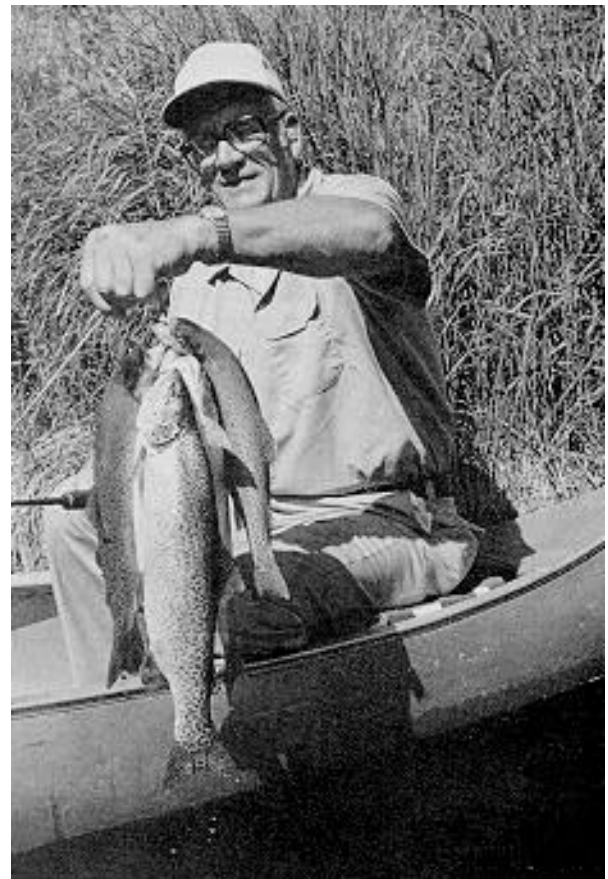
When vegetation keeps sediment out of stream channels and plant roots stabilize stream banks, streams develop channel features more suitable for fish. In general, stream channels become narrower and deeper when corridors of vegetation or rock rip-rap protect their banks.

Where bank slumping occurs because of grazing, cropping or construction, sand and silt fill in pools and also fill spaces between the gravel in shallow reaches. When sedimentation is reduced, spring high waters clean out pools and cause rocky riffles to develop in shallow areas. Where a natural "riffle and pool" streambed pattern develops, both the shallow, rocky areas and the deep pools are important to aquatic life. Open spaces that develop between rocks and gravel in shallow areas provide good spawning habitat for game fish, a protected place for their young and improved production of fish food such as aquatic insects. The insects also help clean streams by eating organic matter such as leaves that fall into streams. Deep pools provide good habitat for aquatic plants, which provide cover for game fish. The deep water, slow current and plants attract large game fish.

Overhead cover of grassy vegetation increases the area of streams inhabited by game fish. Where cover is available, the number of fish and fishing success increase substantially compared with areas where banks have slumped. Overhanging vegetation is a source of terrestrial insects that fish eat, possibly contributing to the observed increase in fish.

Vegetation along stream corridors leads to lower summer water temperatures, which are desirable for fish such as trout and small mouth bass. The insulating effect of shore vegetation also may help reduce anchor ice – a condition harmful to incubating trout eggs and aquatic insects. The influence of cover on water temperature depends on the type of vegetation and the nature of the water source. Spring-fed streams respond to shading more than those receiving surface flow.

Improvements in water quality and in the stream channel can improve a stream's fishery tremendously. On a small creek in Jackson County, for example, trout averaged 150 per acre of water before cattle were fenced out. A few years after fencing, trout numbers increased to 1,500 per acre, and the stream no



longer needed stocking because the trout could reproduce naturally. Stream improvements in other parts of the state have produced similar results.

How wide should a vegetated buffer strip be to provide these benefits? The answer depends partly on the unique conditions at each site, but most experts agree that 50 to 100 feet of natural vegetation protect water quality and improve stream conditions for fish and other aquatic organisms. A corridor of this width also will provide suitable habitat for many wildlife species.

Different types of vegetation play different roles in improving the riparian environment. Together, the riparian vegetation creates a rich and stable ecosystem.

VEGETATION	BENEFITS
TREE AND SHRUB CANOPY overhanging the channel	<ul style="list-style-type: none"> ■ Shade lowers the water temperature, which improves the conditions for desirable game fish. ■ Source of large and fine plant debris. ■ Source of terrestrial insects that fish eat.
LEAVES, BRANCHES AND OTHER DEBRIS in the stream channel	<ul style="list-style-type: none"> ■ Helps create pools, riffles and cover. ■ Provides food source and stable base for many stream channel aquatic organisms.
ROOTS in the streambank	<ul style="list-style-type: none"> ■ Increases bank stability. ■ Creates overhanging bank cover.
STEMS AND LOW-GROWING VEGETATION in the floodplain	<ul style="list-style-type: none"> ■ Retards movement of sediment, water and debris floating in flood water

THE IMPORTANCE OF STREAM CORRIDORS FOR WILDLIFE

Riparian areas are important to anyone who hunts, traps or simply enjoys the spring chorus of frogs and the song of birds. Stream corridors support an abundance of wildlife. Waterfowl, especially wood ducks, frequent quiet backwaters and pools. They nest in tree cavities or nest boxes near streams. Herons, kingfishers and other fish-eating birds search for food in the shallow water. Beaver and muskrat make their homes on streams and may alter the habitat with dams, lodges and bank dens. During spring and fall, flocks of songbirds rest along stream corridors during their migration. Other songbirds remain to raise their offspring during summer. Pheasants often winter in brush or cattails along the edge of a stream. Wooded streams provide daytime cover for deer, raccoons, fox and other animals that roam across farm fields at night. Many reptiles, such as turtles and snakes, thrive in riparian areas. Amphibians such as salamanders and frogs mate and lay eggs in the water. The reptiles and amphibians provide an important food source for larger animals.

In Wisconsin, different wildlife live near a fast flowing north woods river than in the bottomlands of a southwestern stream, or near a meandering creek in central Wisconsin. Although the species that live in stream corridors differ from one part of Wisconsin to another, all wildlife have similar basic needs: food, water and shelter. We call the combination of these factors habitat.

Stream corridors are transition zones between wet lowlands and dry uplands. They often include a greater variety of plant types and habitats than neighboring upland areas. In areas of intensive farming where tillage operations remove most crop residues, riparian vegetation provides cover for reproduction, escape, and nesting, and protection from the weather. Where farm fields are bare much of the year,

stream corridors provide abundant food and water year-round. They also provide corridors for wildlife to move from one area to another.

Careful management of stream corridors can make naturally good habitat even better. Planting shrubs and trees can enhance some areas. For example, pheasants find wild grapes and dogwood highly desirable. The Wisconsin Department of Natural Resources sells “conservation packets” of plant materials through state

Riparian vegetation supports a great variety of birds. The Audubon Society reports that the species listed below are the most abundant breeding birds in riparian areas.

SPECIES	HABITAT PREFERENCE	
	EDGE	FOREST
Red-eyed vireo		X
Northern cardinal	X	
Common yellowthroat	X	X
Song sparrow	X	
Wood thrush		X
American redstart	X	X
Acadian flycatcher		X
Red-winged blackbird	X	
European starling	X	X
American robin	X	X
Gray catbird	X	
Tufted titmouse		X
House wren	X	
Mourning dove	X	
Eastern wood pewee		X
Yellow warbler	X	
Rufous-sided towhee	X	X
Northern oriole	X	
Indigo bunting	X	
Ovenbird		X
Parula warbler		X
Common flicker	X	X
Blue jay		X

nurseries. The packets can be very useful in stream corridors.

Stream corridors benefit wildlife more if the corridors are linked to other areas of cover. Landowners can establish hedges, leave unmowed areas along fences or drainageways or carefully place brush piles across large open areas. Natural cover in corridors can be enhanced with nest boxes for wood ducks, squirrels or other species if natural tree cavities are scarce. Such improvements take little expense and only a few hours of work.

Many animals feed on waste grain and residues from corn and other crops. Landowners can make stream corridors more attractive to wildlife by leaving a few strips of corn or other crops unharvested in fields along the corridor’s edge. Weeds such as foxtail, ragweed and smartweed — which mature in cornfields late in the year — provide food for pheasants, songbirds, squirrels and other small animals. Even conservation tillage, a practice which seems to have little to do with wildlife habitat in stream corridors, can be important. For wildlife, the less tillage the better. For example, no-till leaves the entire unharvested crop residue, which in a cornfield may be several bushels per acre. Even light disking can remove up to 75 percent of some crop residues.

IMPROVING STREAM CORRIDORS THROUGH LOCAL ACTION

Landowners, volunteer groups and government conservation agencies working together can improve and protect stream corridors. By making simple and inexpensive changes along streams, landowners can reduce erosion, protect property values and the productivity of their land, provide wildlife habitat, reduce flooding and help bring about a cleaner stream for the kids to fish. With a small investment in time, labor and money, volunteer organizations can enjoy the recreational benefits of a more natural environment, more wildlife, better

fishing and, in some cases, easier access to these valuable areas. State and local conservation agencies generally can provide technical assistance on the kinds of improvements needed at a particular site. Also, specialists with these agencies can explain how to take advantage of existing government conservation programs, and can help make sure that improvements meet the requirements of local and state regulations.

Every situation presents different problems and opportunities, and conservation and other volunteer organizations often have different interests and resources. Here are some ways groups have worked to conserve stream corridors.

Providing Labor and Materials

In many areas of Wisconsin, farmers and volunteer groups have worked together to fence streams. For several decades, the Dane County Conservation League and Trout Unlimited have provided the labor and materials to fence many miles of streams, helping to restore excellent trout fishing in some streams. The clubs organize weekend work crews, and spend club dues and donations solicited from outside sources to pay for materials. These groups and landowners also have made the fenced streambanks more habitable for wildlife by planting and maintaining suitable vegetation, installing tree boxes for wood ducks and making similar improvements. In return, some landowners sign an agreement which allows public access for fishing.

Donating Money

In some Wisconsin counties, local Land Conservation Departments have hired students during the summer to install fence on cooperating farms. One possibility is to contribute money to the county to help support the fencing. For example, a rod and gun club in Barron County used this approach a few years ago. Their \$500 donation resulted in several additional miles of fenced streambanks.

Working Through Government Conservation Programs

State and federal programs provide money to help farmers pay for soil and water conservation practices. These programs generally provide 50 to 75 percent of the cost of streambank protection practices such as fencing, establishing vegetation along streams to act as filter strips and installing rip-rap to stabilize eroding banks. Local conservation and service organizations can help protect stream corridors by “piggy-backing” their efforts onto these programs.

One approach is to contribute money to lower the costs of streambank improvements for landowners. For example, several Wisconsin streams are designated “priority watersheds” under a state program to improve water quality by helping landowners pay for conservation practices. Cost-sharing through Wisconsin’s Priority Watershed Projects generally provides a 70 percent share of the cost of installing stream bank protection measures. However, the program permits “local contributions” to increase the cost-share to 90 percent. For example, for a \$2,000 streambank-improvement project without a 10 percent local match, state funding would cover \$1,400 and the farmer the remaining \$600. A local contribution of \$200 would result in the farmer’s costs decreasing to \$200 and the state increasing its share to \$1,800.

Another way for groups to coordinate their efforts with cost-sharing programs is to provide the additional labor and materials to turn a soil-conservation project beneficial to a farmer into a project with multiple resource benefits. For example, a farmer may receive a cost-share payment to install a grass filter strip along a streambank. The payment generally covers a percentage of the cost of preparing the surface and seeding a permanent cover such as a grass and legume mix. The payment normally does not cover the cost of additional plantings that would make the filter strip better wildlife habi-



Conservation organizations' support and involvement increases landowner use of conservation practices that benefit fish and wildlife.

tat. Interested conservation groups could donate money, materials and labor to add trees and shrubs that provide food and cover for more wildlife species.

Working through cost-sharing programs can sometimes be profitable to volunteer organizations. In Dunn County, for example, a local service club organized work crews for a cost-shared fencing project. The club bought the fencing materials and constructed the required fences. The club received the payment that normally would have gone to a commercial contractor. Because club members donated the labor, they made a profit and used the money to support other club projects.

Maintaining Steam Corridor Vegetation

Sometimes landowners have protected vegetation in stream corridors for years. However, that vegetation might not provide the best mix of plant species and types. For example, tag alders and willows sometimes take over streamside areas. This vegetation is adequate for soil conservation but is less than ideal for fish and some kinds of wildlife. Volunteer groups, landowners and conservation agencies can sometimes re-establish a more desirable mix of vegetation in such areas. Fences along streams

also require maintenance. Floods, ice floes, falling trees and cows take a toll on fences.

Cost-sharing programs generally require that landowners maintain conservation improvements for a set time, usually 10 years for the various streambank practices. Maintenance includes removing overgrown and dead vegetation, repairing fences and replacing washed-out rip-rap. This can cost landowners a significant amount of time and money. Volunteer groups can work with landowners to maintain the practices. Such an agreement ensures that the conservation practices achieve the desired results, and also might encourage landowners to install other conservation practices. In some cases, volunteer groups and landowners have worked out easements that allow public access in exchange for ongoing maintenance.

Supporting Legislation

New government programs are no substitute for direct efforts of conservation groups and landowners. However, conservation groups also might contribute to stream corridor protection by supporting legislation to protect and manage riparian areas. Wisconsin currently has no program specifically designed to encourage private landowners to manage riparian areas for their multiple resource benefits.

Existing laws and programs address the situation only indirectly. For example, a number of state regulatory programs prohibit or require a permit for removing vegetation along shorelines, and counties are required to enforce shoreland zoning ordinances. However, these regulations weren't designed to encourage good management practices on private land. Farm conservation cost-sharing programs are designed to save soil and protect water quality, but do not pay for improvements to directly benefit fish and wildlife. The Wisconsin Department of Natural Resources uses some fishing license fees to improve trout habitat by making improvements on public lands and leased areas along streams.

However, the program addresses only one facet of conservation in stream corridors – improving trout fishing.

The missing element is legislation that recognizes the unique, multiple resources in riparian areas, and offers incentives to landowners and volunteer groups to protect and manage these lands for multiple resource benefits. Possibilities include paying landowners for setting aside these lands if farmers currently crop or graze them, adding specific wildlife habitat improvements to the list of items cost-shared under various conservation programs and providing technical assistance for managing these lands for multiple resource benefits.

SOURCES OF ADDITIONAL INFORMATION

Wisconsin Department of Natural Resources. Specialists at area offices can provide advice on appropriate riparian improvements on individual sites, describe stream improvement projects in your area and explain state regulations affecting activities in riparian areas.

County Land Conservation Departments and USDA Soil Conservation Service. Conservation specialists can provide information on soil and water conservation practices needed on specific sites, cost-sharing programs operating in your area and opportunities for tying fish and wildlife improvements into soil conservation improvements.

County Extension offices. Extension agents can direct you to specialized sources of information, and assist in organizing local efforts.

Authors: Scott Craven is a professor of wildlife ecology with the College of Agricultural and Life Sciences, University of Wisconsin-Madison, and a wildlife specialist with the University of Wisconsin-Extension, Cooperative Extension. Gary Jackson is a professor with the Environmental Resources Center and the University of Wisconsin-Extension. Bill Swenson is a professor of biology and an Extension specialist with the Environmental Resources Center and the University of Wisconsin-Superior. Bruce Webendorfer is a specialist with the Environmental Resources Center and the University of Wisconsin-Extension.

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