



## STREAMS AND RIVERS

Michigan wetlands are classified according to where they are found. Wetlands that occur on the edges of lakes and reservoirs are called lacustrine. Wetlands that form on the edges of shallow bodies of water such as marshes or bogs are called palustrine. Those that include rivers, streams, and surrounding areas are called riverine. Riverine wetlands are often the least stable because periodic flooding causes erosion and sedimentation.

Riverine wetlands are also among the most important. Streams and rivers serve as travel corridors for wildlife, both resident and migratory. Streams are identified as flowing bodies of water with a defined bank and bottom. These waterways, along with adjacent communities called riparian zones, provide a variety of substrates and an abundance of food--insects for birds and fish; and amphibians and reptiles for herons, raccoons, and other predators. Water, combined with trees, shrubs, and grasses, furnishes a rich variety of habitat for muskrats, mink, and beaver. Frogs and salamanders live in the shallow water of streams and along their muddy banks. Wood ducks laze in quiet backwaters and nest in tree cavities. Kingfishers fish from tree limbs above the river. Vireos, thrushes, and warblers use streamside cover as part

of their nesting habitat and as shelter during migration. Brown bats and swallows gorge themselves on insects produced by these waterways and their adjacent communities. Shallow river expanses also provide important spawning-nursery habitat for fish, especially northern pike.

Because waterways are dynamic pieces of the wildlife-habitat puzzle, you are fortunate if a stream or river crosses your property. Michigan has an abundance of moving water--more than 36,000 running miles of navigable rivers and streams--plus countless more miles of brooks and other tiny tributaries. Some are so small they are barely noticeable, and yet each is vitally important.

### Management Options

There are several things you can do to improve wildlife habitat in a riverine wetland. Before considering improvement projects, the waterway and riparian zone must be assessed to determine its current condition. In general, if a stream or river has little riparian vegetation, little in-stream cover (rocks, logs, vegetation), is relatively straight and shallow, or is subject to considerable amounts of erosion, it may be in need of some improvements. As with any wetland, it is important to seek assistance before making any management decisions. Contact the Department of Environmental Quality Land and Water Management Division, or your local Conservation District office for assistance with your management plan.

The following are options to consider when managing streams and rivers:

#### *Keep Livestock Out*

Allowing cattle and other livestock to access the stream can create enormous problems. The animals are capable of destroying wildlife habitat, polluting the water, and trampling streambanks causing erosion. If cattle must cross the stream to reach pastures on the other side, install a fence that will limit their access to one site. Adding



approaches of concrete, gravel or broken rock will lessen the cattle's impact. If livestock currently drink from your stream, consider the variety of low-cost watering systems now available. At the very least, choose a small section of the waterway that does not have a steep embankment, and weigh the cost and benefits of building a fence.

### Improve Riparian Habitat

Maintaining a buffer strip from 100 to 200 feet wide or wider on each side of the waterway will help provide homes for wildlife, prevent erosion, and maintain water quality. The buffer will slow siltation of the stream and absorb pesticide and fertilizer runoff. You can improve the existing buffer or create a new one by planting trees, grasses, or shrubs. In southern Michigan, silver maple, red maple, cottonwood, and basswood can all be grown from seedlings. In northern Lower Michigan and the Upper Peninsula aspen, black ash, alder, balsam fir, and white spruce are good species to consider. In really wet areas black spruce and tamarack might be better choices. If beaver are undesirable because of possible tree damage on your property, consider planting evergreens although beaver might even girdle and kill a few of them. Refer to the

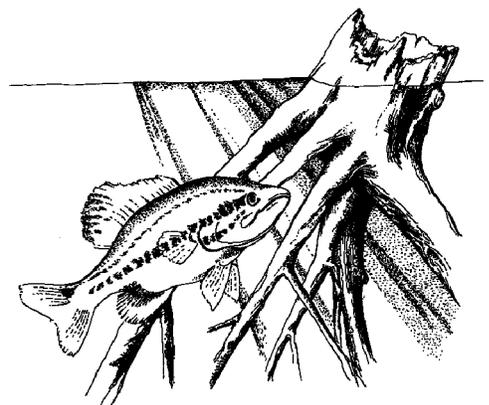
chapters in the **Forest Management** section for more information on tree species and their requirements. Gray dogwood, silky dogwood, red-osier dogwood, hawthorn, ninebark, serviceberry, elderberry, and high-bush cranberry are fruit-bearing shrubs that offer good sources of streamside food and cover for songbirds, pheasants, and ruffed grouse.

If you want to create a grassland instead of forest or brush, wildflowers and certain grasses like timothy, orchard grass, or switchgrass may be suitable choices. Depending on soil conditions, you could also plant alfalfa, medium-red clover, and other legumes, which will attract birds as well as rabbits, woodchucks, mice, and other small mammals. Planting wildflowers is also a good option. If you fertilize or mow streamside areas, stay back from the water's edge a distance of at least 100 feet. For more information, refer to the **Grassland Management** section or to the chapter on **Wildflowers** in the Backyards section.

Doing nothing, of course, is also an option. If you choose not to mow, cultivate, or selectively log the riparian corridor, natural processes will eventually change that area with no effort on your part. The disadvantage to the natural process of succession is that changes may not be what the landowner wants. However, if the natural changes fit within the landowner's goal, then doing nothing is the right management option and will also benefit the riverine wetland.

Any harvest of streamside timber must be done with great care. The trees and shrubs that grow along Michigan's waterways are critical components of wildlife habitat. They attract insects that fish and wildlife feed upon, help cool water temperatures, and provide shade. Fallen trees provide loafing areas for ducks, snakes, and turtles and protective cover for fish. They also provide important habitat for insects and smaller forage fish and are a natural source of nutrients. Besides food in the form of nuts and berries, riparian cover offers dens, roosts, and nesting sites as well as safe travel lanes. For these reasons cutting timber in riparian zones can seriously damage the stream and its value to wildlife if done improperly.

However, if timber harvesting is part of your overall plan, arrange logging trails and roads as far away from the waterway as possible to avoid erosion and any alteration to the stream flow. Also, use extreme caution when cutting within 100 feet of a stream, lake, pond, or open water wetland. Logging can be conducted in the suggested 100-foot buffer area without harming nearby waters if good management practices are employed. Key things to keep in mind when logging within the buffer area are



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keeping soil disturbance to a minimum and not operating wheeled or tracked logging equipment when soils are wet. Further, use selective harvesting techniques as they result in the least amount of disturbance. Try to spare most nut and fruit producing trees and leave at least one to six snags or den trees per acre for those birds and mammals that rely upon them. Dead trees about to fall into the stream should be left alone. Remove in-stream logs and fallen trees only if they are causing problems.

## Improve In-stream Habitat

The goal of most landowners who improve habitat within a stream is to improve fish populations, but many of the improvements they make will also benefit wildlife. Stream management is an exacting science, the objectives of which are often to create a diversity of habitat with a variety of water depths, remove sediments by flushing action, add cover for fish, and increase substrate and other food-producing habitats. Wildlife is a secondary beneficiary of these improvements. For example, increasing the amount of insects for fish means more food for turtles, frogs, and birds. Producing more fish enhances the food supply for herons, mink, and otter.

Improving in-stream conditions can be as simple as adding rocks, logs, and rootwads to create hiding cover, or as work-intensive as building wing dams and bankside cribs. Costs can range from no expense to very expensive, especially if earth-moving equipment must be used. Remember, it is important to receive guidance from a professional before starting any of the projects listed below so as to not cause damage to the stream or river. The Department of

Environmental Quality (DEQ) Land and Water Management Division is responsible for administering Michigan's Inland Lakes and Streams Protection Regulations. A permit is required to do any in-stream work. This protects streams and inland lakes larger than five acres from unauthorized dredging, filling, or construction of permanent structures below the ordinary high-water mark. The law also requires a permit for dredging within 500 feet of a lake or stream. Alerting Michigan DEQ officials to illegal excavation activities is also an excellent means of stream and river conservation.

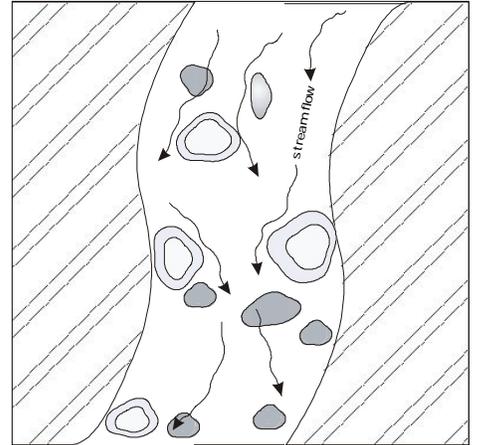
The following are five basic project suggestions to consider when improving in-stream habitat:

### 1. Boulder placement.

Adding large boulders with irregular surfaces creates overhead cover and resting pockets for fish to hide. It also increases water depth from the natural scouring that occurs downstream of the boulders. The best results occur when boulders are placed in groups anywhere in the stream where currents exceed 2 feet per second.

### 2. Cover logs.

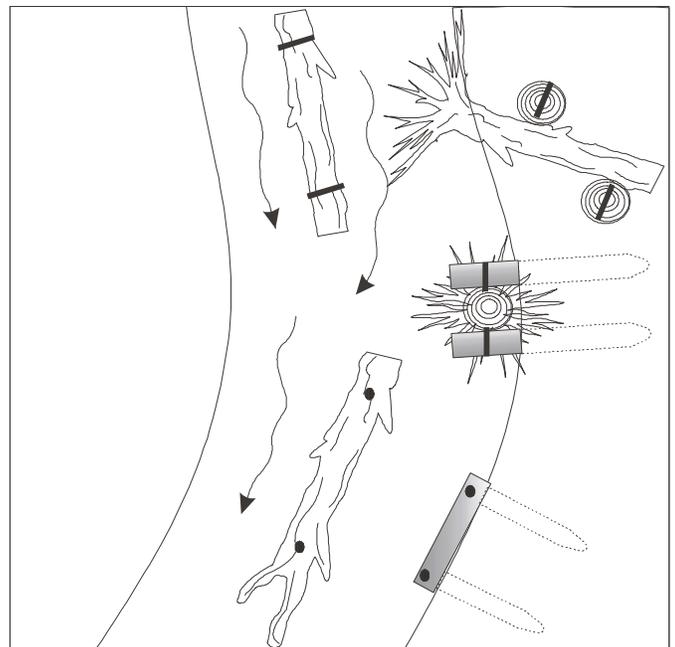
These structures provide overhead cover where water depth is adequate but cover is lacking. Logs with diameters larger than 10 inches work best in open pools, rapid currents, or flat water where the water is at least 8 inches deep. Crooked logs and



stream boulder placement

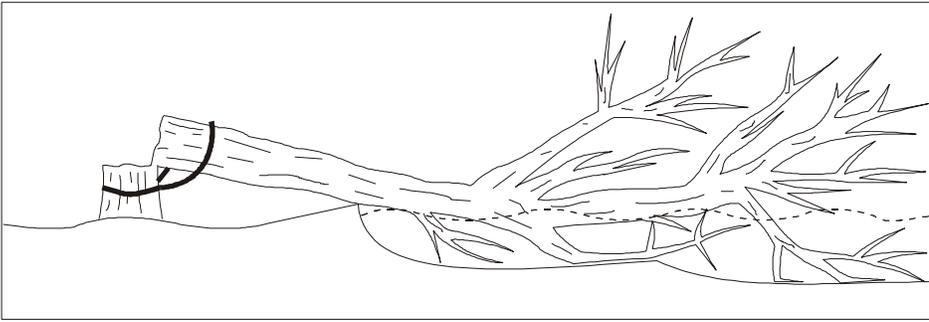
those with protruding limbs of several inches produce turbulence and spot scouring, both of which are advantageous. Use logs already in the stream or roll a few felled logs from the bank into the stream. Place them parallel to the flow or at a slight angle. Anchor with stakes (construction rebar works best) to prevent washing away during flood periods.

3. **Rootwads.** When trees fall over from windstorms or erosion, their complex root systems, or



Cover logs and root wads

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Hinge-felled tree cover

rootwads, usually become exposed. When submerged, these rootwads can create ideal habitat for fish. If rootwads exist in your stream, leave them. If they lie along the banks, consider pulling them into the stream, especially in places where the waterway meanders to prevent washing away during flood periods.

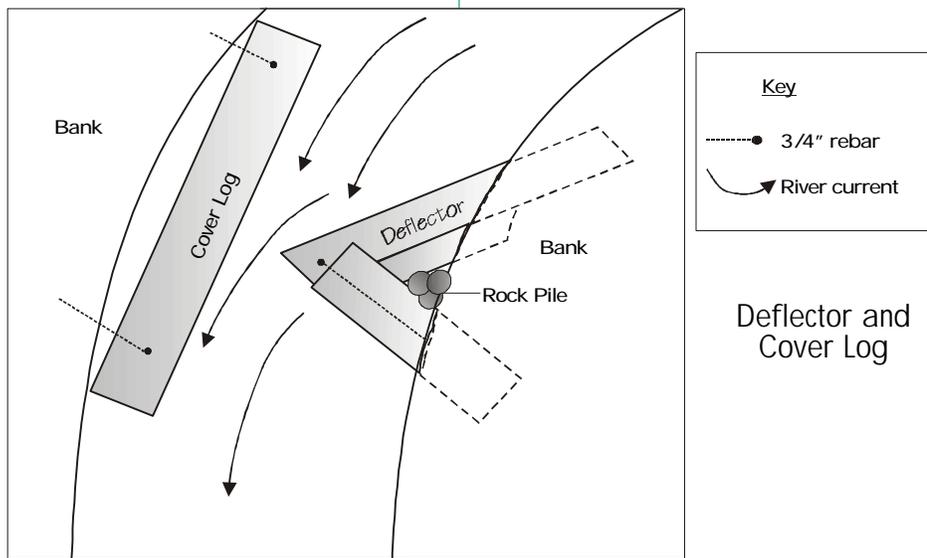
4. **Tree covers.** Felled trees placed in wide, shallow streams with sand or gravel substrates provide excellent overhead cover for

fish and good substrate for insects. They may also help to increase water velocity by serving as deflectors to constrict wide, shallow channels. The increased velocity helps flush sediment out and creates deeper scour pools that create good fish habitat. Individual trees can be hinge-felled so they topple into the stream but remain connected to the stump. Adding a cable from trunk to stump will ensure stability. Choose trees that can be spared without creating an erosion problem. These trees

should always be placed nearly parallel to water flow. Placing the tree perpendicular may cause erosion around the ends.

5. **Deflectors.** Deflectors constrict and divert water flow to create meanders in the stream. In addition, pools are formed in the stream bed by the scouring and relocation of fine sediment and gravel. Deflectors work well in places where the banks are too low or too wide for dams, and they are much more cost-effective than dams. Various designs abound--the simplest ones involve placing heavy boulders or anchored logs across the stream to create a narrow opening through which rushing water creates the desired effect. Care must be taken not to direct water flow into the opposite bank, thus creating a new erosion problem.

In summary, rivers and streams and their adjacent riparian communities are among the most important of all wildlife habitats. Managing these waterways as part of the overall plan for your property can produce relatively fast, long-lasting benefits that are cost-effective and enjoyable.



Deflector and Cover Log

## FOR ADDITIONAL CHAPTERS CONTACT:

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**Private Land Partnerships:** This partnership was formed between both private and public organizations in order to address private lands wildlife issues. Individuals share resources, information, and expertise. This landowner's guide has been a combined effort between these groups working towards one goal: Natural Resources Education. We hope this manual provides you with the knowledge and the motivation to make positive changes for our environment.

FOR ADDITIONAL ASSISTANCE: CONTACT YOUR LOCAL CONSERVATION DISTRICT