

EXTENSION NOTES



IMPROVING FISH HABITAT

The health of fish populations often depends on naturally occurring elements, such as the availability of food, and the impact of human activities. Unfortunately, of the two, human activities are often the more destructive. There

are, however, many things that individuals and groups can do to restore or enhance aquatic habitats and improve local fisheries. This Extension Note highlights some of them.

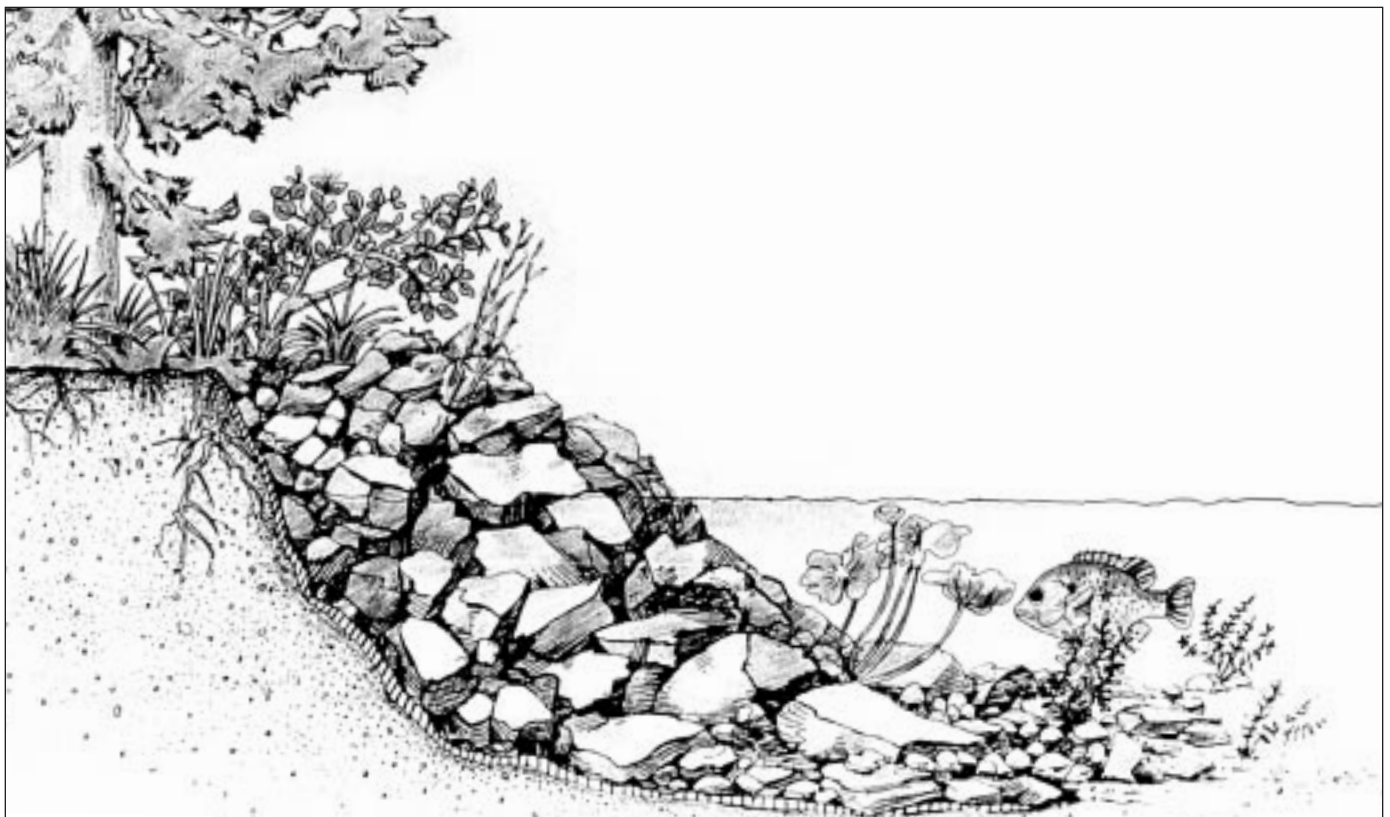
BEFORE YOU BEGIN

Plan ahead. Before leaping into your project, consider the following:

1. Find out what type of aquatic habitat exists in the waters where your restoration work will take place.

Talking to a Ministry of Natural Resources' biologist is often a good way to find out.

2. Identify the most limiting feature of the aquatic habitat and work on improving it.



3. Focus on preserving or restoring natural processes and natural features of streams, rivers and lake shores.
4. Promote diversity in aquatic habitats.
5. Use natural materials.
6. Avoid using heavy equipment in the water. Manual work is less damaging to existing habitat.
7. Be sure your project is consistent with the Ministry of Natural Resources' long-term fisheries management plans.

WHAT YOU CAN DO

There are several types of fish-habitat improvement projects:

1. CREATING OR ENHANCING A SPAWNING BED

Spawning beds can be scarce in some waterbodies. But before improvements can be made, you'll need to know what species of fish you're dealing with and what their spawning requirements are. For example:

- **northern pike:** seasonally flooded marshes and wetlands near grassy hummocks
- **trout & salmon :** stream channels or riffle areas with clean gravel-cobble substrate
- **bass & panfish:** pea gravel in shallow littoral areas (bass will also use artificial spawning boxes)
- **walleye:** cobble-rubble in fast-flowing streams and wind-exposed shoals of lakes

In addition to creating or enlarging spawning beds, you can improve habitat by cleaning silt, debris and algae away from existing sites. You can also open or clear springs and groundwater seepage areas favoured by spawning brook trout. Hoses with high-pressure pumps are effective in cleaning spawning shoals for lake trout, walleye and bass.

2. STABILIZING BANKS AND CONTROLLING SHORELINE EROSION

Unstable shorelines can release silt that can choke nearby aquatic habitats. Here are a few things you can do to prevent or control shoreline erosion:

- Install fencing or cattle guards to keep livestock away from shorelines.
- Use rip-rap (logs or stone) or armour stone underlain with filter cloth to reduce erosion and stabilize banks.
- Plant grass and shrubs near the water's edge and trees farther back to provide shade as well as food-production areas.
- Plant aquatic vegetation, when necessary, to provide spawning and food-production areas and protection for small fish.

To obtain indigenous trees and shrubs that can be used for shoreline restoration programs, contact the Mutual Association for the Protection of Lake Environments Inc. (MAPLE), P.O. Box 271, Perth, Ontario K7H 3E4.

3. CLEARING OBSTRUCTIONS

In some cases, you may need to remove obstructions, such as beaver dams, that impede the flow of water and block the movement of fish. In other cases, the obstruction may be best left alone, as in the case of some fallen trees. Before any structure is removed or left in place, however, it is important to evaluate its importance to existing habitat.

4. BUILDING UNDERWATER STRUCTURES

Underwater structures can protect fish from predators and injury in fast-moving currents in streams and rivers. These structures also give fish an opportunity to rest, hide, feed or spawn. Adding underwater structures to water bodies with uniform bottoms can be simple and effective.

Here are a few of the underwater structures that can be used:

- **Half Logs**

These are usually green, oak logs sawed lengthwise. They are either anchored (flat-side down) to the bottom by steel rods, or suspended from concrete blocks. They are best used in downward-sloping streams or shallow areas of ponds and lakes. Keep in mind that the river bottom must be firm and that routine maintenance will be required.



Underwater structures give fish a place to rest, hide, feed and spawn.

- **Brush Shelters and Log Cribs**

These structures are usually made of green, cedar logs fastened together in a crib shape and held down with stone or concrete blocks. Log cribs are often placed on the ice during the winter months and left to drop to the bottom during spring breakup. They work best in inland lakes. However, they can interfere with navigation if they're not placed in a suitable spot. In streams, well-anchored brush shelters can be used.

- **Boulder Clusters and Rock Piles**

Boulders placed (individually or in clusters) in streams and small rivers can break fast-moving currents and provide a resting area for fish. Use large boulders (more than half a metre in diameter) and place them away from the shoreline, particularly if they are likely to increase the speed of the current. In small lakes and ponds, piles of boulders or concrete blocks can be used to attract a variety of fish, including bass, panfish, bullheads and walleye.

- **Rootwads and Brush Bundles**

Stumps, rootwads and brush bundles can provide important habitat, especially for largemouth bass and bullheads. Simply anchor these materials in the shallow waters of streams or in the near-shore areas of lakes and ponds.

- **Artificial Reefs**

In large water bodies, such as the Great Lakes, artificial reefs are often the best method of creating habitat. Reefs should be constructed of large boulders and clean rip-rap material submerged in at least three to six metres of water.



Deflectors in streams concentrate or redirect water flow to restore meandering streams.

Try to place reefs near drop-offs, beds of aquatic vegetation and other underwater structures.

- **In-Stream Structures**

There are a number of structures that can improve habitat in streams. For example, deflectors can be built to concentrate or redirect water flow and to restore meandering streams. Digger logs can be used to create small pools. Floating platforms can be installed on a seasonal basis to provide overhead cover. Angled log pilings can be inserted into stream beds to create mid-channel feeding areas. Log wedge dams can be built in trout streams to create pools. Artificial structures can be built along the shoreline to create overhanging cover and to undercut banks.



Planting aquatic vegetation provides protection and spawning and food-production areas for small fish.

THE COMMUNITY FISHERIES INVOLVEMENT PROGRAM

The Community Fisheries Involvement Program was established in 1980 to encourage people to undertake fisheries habitat improvement projects. To qualify for CFIP funding, projects must be of public benefit and all labour must be voluntary.

If you or your group are interested in taking part in CFIP, contact your local Ministry of Natural Resources office for more information.

GETTING STARTED

Restoring fish habitat is easy if you have all the right information. Get as much advice as you can from your local Ministry of Natural Resources office before you begin. Local fishing clubs and the Conservation

Authority in your area may also provide assistance. As well, be sure to obtain all necessary approvals and permits before you begin.

FURTHER READING

- American Fisheries Society and The Wildlife Society. 1983. *Stream Obstruction Removal Guidelines*. Bethesda, Maryland. 9 p.
- Cairns, J. 1988. *Rehabilitating Damaged Ecosystems*. CRC Press, Boca Raton, Florida. 192 p.
- Department of Fisheries and Oceans and British Columbia Ministry of the Environment. 1980. *Stream Enhancement Guide*. Vancouver, British Columbia. 95 p.
- Hunt, R.L. 1993. *Trout Stream Therapy*. University of Wisconsin Press. 4 p.
- McComas, S. 1993. *Lake Smarts: The First Lake Maintenance Handbook*. Terrene Institute, Washington, D.C. 215 p.
- Migel, J.M. 1979. *The Stream Conservation Handbook*. Crown Publishers. New York. 242 p.
- National Research Council. 1992. *Restoration of Aquatic Ecosystems*. National Academy Press, Washington, D.C. 552 p.
- Ministry of Natural Resources. 1980. *Trout Stream Rehabilitation*. Community Fisheries Involvement Field Manual. 273 p.
- Ministry of Natural Resources. 1993. *Lake and River Fisheries Rehabilitation*. Community Fisheries Involvement Field Manual. 235 p.
- Seaman, W. and L.M. Sprague. 1991. *Artificial Habitats for Marine and Freshwater Fisheries*. Academic Press, Toronto. 285 p.

For more information contact:

LandOwner Resource Centre

P.O. Box 599, 5524 Dickinson Street
Manotick, Ontario K4M 1A5
Tel 613 692 2390 or 1 800 387 5304
Fax 613 692 2806

Product Ordering: 1-888-571-INFO (4636)

E-mail: lrc@sympatico.ca

Internet: <http://www3.sympatico.ca/lrc>

Produced by:

- LandOwner Resource Centre

With support from:

- Canadian Wildlife Service
- Ontario Ministry of Natural Resources

© 1999, Queen's Printer for Ontario

ISSN 1198-3744

R.P.

(1k P.R., 99 09 09)

Order Number: LRC 45

Cette publication est également

disponible en français.

 printed on recycled paper