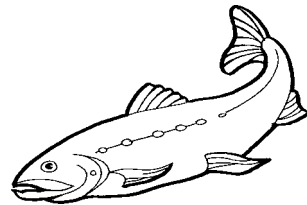


A growing human population, along with an increase in rural development, has brought society both physically and figuratively closer to the natural resources we depend on. Human and natural disturbances such as cattle grazing, roadside runoff, refuse disposal, shade removal, sedimentation, and denitrification impede to ability of streams to provide fish habitat and healthy fish populations. Cooperative habitat improvement strategies can have an enormous impact on restoring or improving fish habitat. When local land owners work with governmental agencies, a strategy can be developed and applied to improve the viability of fish habitat located on private lands.

For assistance with determining needed habitat improvements in your area contact your local fish and game management agency.



Other sources of information:

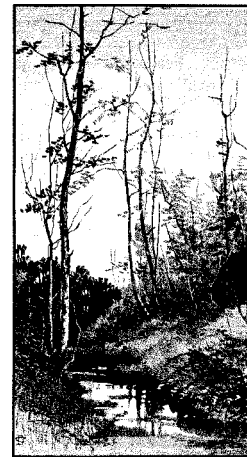
Daniel, A. 2002. Fish Habitat Structures In Presque Isle Bay <http://www.pserie.psu.edu/seagrant/communication/fact/fs6.html>

Northwest Ecosystem Institute Web site: www.ecosystems.bc.ca © Northwest Ecosystem Institute 2002

Authors:
Jeremy Brown & Jake Marti
Natr 280 Students
Dept. of Natural Resource Sciences
Washington State University



Techniques for Improving Fish Habitat within Rivers and Streams



The ecological health of streams and drainages is an important aspect of the hydrologic cycle. Channeling and housing water runoff, these bodies of water carry an abundance of fish and other wildlife species. The riparian habitat type, or landmass alongside rivers and steams, is an integral element that determines the wellbeing of a fish population. The ecological condition of the riparian area that surrounds the stream is a land mass that plays an important role in the survival of fish. Streams and their associated shorelines must be properly managed for fish to thrive.

Spawning, nesting and the need for security from predators can be improved by using artificial habitat structures. Habitat structures also provide cover for adult gamefish and can improve the success rate of the angler. For rivers and streams, habitat improvement techniques within the channel can be accomplished in a variety of ways. Boulder clusters and log ramps within small streams can provide shelter to fish populations.

The rock size required for physical stability depends on the size of streams and the rock densities at which the stream begins to significantly alter its flow. Improper placement of boulder clusters and log ramps can compound problems caused by moving sediment, altered water flow, and channel relocation.

Low nutrient levels in small streams can reduce the quality of the riparian area for fish. Artificial stream fertilization can raise the nutrient level of the water body by the replacing of minerals and nutrients. The addition of artificial nutrients may increase the production of algae, insects, and fish. If it is determined that the addition of artificial fertilizers will increase the size of habitat needed for a healthy fish population, then sufficient data should be collected before the current nutrient level is altered. For more information about this subject contact: The Northwest Ecosystem Institute (250-756-0930).



Stabilizing stream banks by the placement of rip-rap (photo left) may significantly reduce the amount of sediment deposited into the stream. By placing rock and natural debris along the banks of receding shorelines sedimentation can be greatly reduced. This rip-rap increases the structural stability of the rivers edge in zones where erosion by stream waters is

prevalent. However, the use of rip-rap in concentrated areas of agricultural production may not have high rates of success where valley bottom clearing and grazing have significantly increased rates of channel shifting. Installing rip-rap in streams through agricultural areas will likely shift the active area of erosion downstream and further reduce quantities of fish habitat.

As an alternative to the use of rip-rap along stream banks for agricultural lands where heavy grazing occurs, corridors may be built to allow the stream to naturally shift. This can be accomplished by building fences to prohibit livestock from destroying the riparian area, and will also help to reduce the amount of sedimentation and increase vegetation. Also, planting trees and shrubs along stabilizing stream banks provides shade and produces cover .

Improper livestock grazing can reduce plant growth and directly alter stream-side vegetation by trampling, rubbing and grazing herbaceous plants and browsing on shrubs. A successful grazing strategy helps to protect streams already in good condition and restores those in bad condition. Grazing strategies that provide the most promising benefits include: controlling the timing of grazing in order to keep livestock off streambanks when they are most susceptible to damage such as springtime runoff, or including the riparian area within a separate pasture with different management objectives and strategies.

When culverts have been installed where roads cross streams, often fish populations can no longer be supported. Culverts can disrupt the movement patterns of fish that are essential to their growth, survival, and reproduction. Specially designed culverts intended to simulate natural streams and control hydrological characteristics may allow fish to use the culvert for more than just passage.

Techniques for habitat improvement of streams and rivers vary depending on the management objective(s) of the land owner. Careful road planning and the placement of fish friendly culverts can control hydrologic flow and open that section of stream to resident fish populations. The correct fish habitat improvement method is site specific and can only be determined by identifying the management objective(s) and adapting those strategies the ecological factors that govern the region.