



Culvert Replacement & Removal

SALMONID HABITAT RESTORATION | Fact Sheet

Where obstructions such as roads block fish from reaching valuable upstream habitat, a stream crossing can restore access, increasing breeding grounds and helping restore healthy populations. Obstructions may occur on streams where existing culverts have collapsed or are undersized, or where they have yet to be installed. Other obstructions are naturally occurring.

On most small streams, crossings are either culverts or bridges designed to provide vehicle or pedestrian access. Not all obstructions or crossings are viable locations for culverts or bridges. Even well-designed culverts can affect native fish negatively. When designing a stream crossing all these factors must be weighed against the potential value of the crossing before deciding whether it is an appropriate project. Note that this type of project is extremely technical and must be designed and supervised by experienced biologists, engineers and hydrologists.

How it Works

Identify a location. A stream crossing is worth considering anywhere a road, pathway or similar obstruction blocks fish passage to otherwise useful habitat. However, not all such sites are ultimately appropriate—consider how much upstream habitat is actually closed off to fish by the obstruction. You'll also need to identify the landowner of the property, whether private, or public, and secure their cooperation.

Analyze the site's characteristics. An experienced hydrologist or engineer will study the site to determine what project is appropriate. This analysis should determine the size and type of crossing (culvert or bridge), stream flow and downstream considerations, direct habitat loss, water quality, upstream and downstream ecological connectivity, channel maintenance, construction impacts, and risk of culvert failure.

Design a project plan. You'll need to secure permission or permits, identify necessary materials, and a source to provide them, establish a feasible construction window, and ensure accessibility for equipment and materials. You'll also need to provide

downstream sediment control, analyze upstream watershed and install a cutoff wall if needed, and tailor project to the environment by making sure the bottom of the culvert closely matches the natural streambed in make-up, materials and grade. The less obtrusive a manmade stream crossing is, the better it is for fish. A biologist can help determine if the proposed design is usable by fish.

Install the culvert. Note that on occasion, the best way to benefit the fish habitat of a particular stream is to remove an existing crossing that has collapsed, become unnecessary, or was poorly built. When removing a culvert, steps must be taken to ensure the natural shape of the stream bed and banks are restored, the shape of the banks matches those up- and downstream of the removed culvert, natural streamside vegetation is planted to match native plants and help prevent erosion, sediment created by removal is filtered and removed, and stream bottom is adjusted to match the natural materials and slope.

Funding. Often there is grant money available from conservation districts or other agencies for replacement of culverts that block fish passage.

What You'll Need

A hydrologist or hydraulics engineer should design all stream crossing projects. He or she will be able to help identify the necessary materials and construction resources to install them. Projects of this nature should be conducted in collaboration with local environmental and/or wildlife agencies.

For more detailed information see the related How-To Guide, "Culvert Replacement and Removal."

Copies of this document are available through Fish First, and can be found on the Web at www.fishfirst.org. You'll also find a library of how-to guides and fact sheets as well as other resources and information to help with salmon restoration projects made possible in part by grants from:



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