

Pennsylvania

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# Township News

## MAKING THE MOST OF EXTRA ROAD MONEY

Experts **GIVE ADVICE** on How to **SPEND WISELY**

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# ENVIRONMENTAL CONCERNS

## Culvert stream crossings should accommodate aquatic life

Townships that need to replace culverts over streams have another factor to consider beyond cost and material: the aquatic life in the stream.

Trout Unlimited is working to make municipalities aware of the need to design culverts to accommodate the passage of fish and other aquatic organisms. The upshot is that structures that fulfill that requirement yield additional benefits, such as better stormwater management and lower long-term maintenance costs, says Amy Wolfe, director of Trout Unlimited's Pennsylvania Coldwater Habitats Restoration Program.

"Culverts that are made to allow for fish passage also address flood resiliency," she says. "All of the culverts that are presenting problems with fish passage are the ones that are having maintenance issues."

One of the reasons for that is because engineers design culverts based on how much and how fast water needs to go through the opening, Trout Unlimited habitat coordinator Phil Thomas says. However, they don't necessarily take into account how much sediment and debris needs to go through the opening at the same time.

"The buildup of sediment and debris creates an hourglass effect at the culvert, and now you have a maintenance issue," he says. "The water velocity increases and damages the downstream headwalls. If the opening is a pipe, the sediment acts as an abrasive, which will eventually wear down the material."

Trout Unlimited is urging municipalities to install culverts that are "bankful width," or the entire width of the stream. Such culverts will accommodate all of the stream load — water, sediment, and woody debris, Thomas says. A wider culvert also allows more daylight under the structure, which

is less intimidating for fish and other aquatic creatures.

Another factor to consider when designing a culvert is the slope and angle of the stream crossing, Thomas says.

"Look at what the waterway is trying to do upstream and downstream from the culvert," he says. "You don't want to put a 6-inch slope culvert in a stream that has a 2-inch slope upstream and downstream."

Care must also be taken to mimic or preserve the natural stream bed, Wolfe says. Three-sided culverts, with no bottoms, allow the natural streambed to continue uninterrupted. Box culverts can work, she says, but they need to be installed at the proper grade so that the bottom doesn't stick up above the stream bed.

Thomas emphasizes that no two stream crossings are the same, however. Each must be evaluated individually to determine the best solution.

The design is just the first hurdle, Wolfe says. Even if the engineer designs the culvert to allow for fish passage, the permit reviewer may not understand the reasoning and the installation may not be done correctly.

"It really takes an understanding of what is necessary for fish passage," she says.

### Cost is higher, but funding can help

Installing stream life-friendly culverts can take a bigger bite out of a township's budget, Wolfe acknowledges.

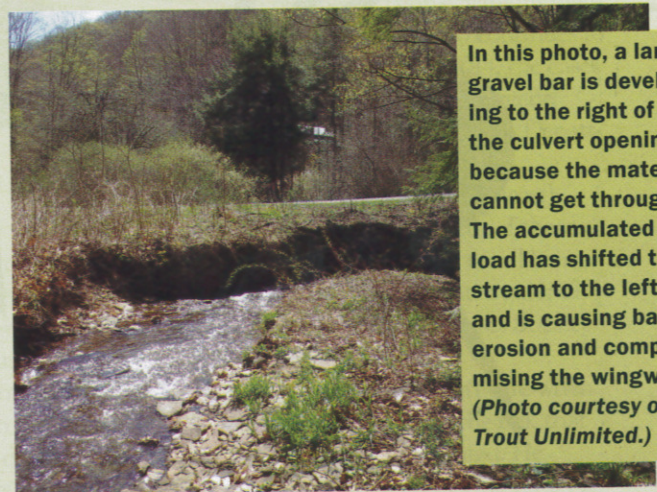
"The upfront cost of materials and installation of culverts that accommodate fish passage can be much higher than standard culverts," she admits.

"However, the long-term maintenance costs are reduced. You are making an initial upfront investment, but you won't have to go in again and again to repair the culvert and stabilize the streambank."

The Dirt, Gravel, and Low-Volume Road Program recently added culvert replacement to its eligible funding targets, she says. To receive funding, the structure to be replaced must be 50 percent or less bankful width and the new structure must be 100 percent bankful width.

Trout Unlimited is working to identify culverts that don't allow for fish passage and are candidates for replacement. So is the North Atlantic Aquatic Connectivity Collaborative. Its Climate-Friendly Stream Crossings Toolkit, available at [www.stream-continuity.org](http://www.stream-continuity.org), is a helpful resource for townships that would like to learn more about this topic.

"Environmental considerations can be a tough sell to a township with a limited budget," Thomas acknowledges. "However, if you put in a culvert that accommodates aquatic organisms, you get longer service life, lower maintenance costs, and flood resiliency. It really is more bang for your buck."



In this photo, a large gravel bar is developing to the right of the culvert opening because the material cannot get through. The accumulated bed load has shifted the stream to the left and is causing bank erosion and compromising the wingwall. (Photo courtesy of Trout Unlimited.)