

Replacing culverts, cleaning ditches?

Plan ahead.

Replacing a culvert can have a big effect on the stream it carries. Set the culvert a couple inches too high and fish can't get to upstream spawning grounds. Speed up water flow and you may cause scouring of the stream bottom and flooding downstream.

Most bridge and culvert projects must meet the standards of *Trans 207* of Wisconsin Administrative Code. In addition, there are erosion control and stormwater runoff regulations that apply to most road rehabilitation or maintenance projects. If a wetland is affected, there may be other local, state and federal protection laws.

Sorting through the guidelines and figuring out which apply when can be pretty confusing. Fortunately, help is available.

"The best rule of thumb is to contact the local DNR liaison for every project. It can take just one phone call to ensure you're protecting the environment," says Al Stranz of DNR's Green Bay office. He's one of eleven DNR staff responsible for coordinating environmental protection with highway and road projects and for seeing that *Trans 207* and other environmental guidelines are followed.

"Every 36 inch culvert in some of my areas has the potential to be a Class I trout stream," Stranz points out. "Set the culvert six inches too high and you block fish from spawning migration. That means you've effectively eliminated it as a trout stream."

Stranz and the other DNR Transportation Liaisons can quickly advise on whether any permits or plans are needed and the depth it should be placed at. They can also recommend ways the contractor can protect the stream during construction.

Mike Exferd, Oconto County Highway Commissioner finds that getting an early start means few delays. "I normally get a letter off to Al [Stranz] in the early part of the year listing the major culvert replacement projects I'm planning. He checks them out and gets back to me by letter with his conditions and concerns." When last minute projects come up, Exferd says, he gives Stranz a call. "Usually he gets back to me pretty quickly."

Contractors, county highway engineers, DOT district engineers, culvert suppliers, and consulting engineers who have worked with WisDOT projects also know the guidelines and can often help local officials plan for culvert projects.

"We do a lot of work with towns," says Jack Dittmar, Waupaca County highway engineer. "We can do the calculations and usually we can show that they're not going to make things any worse." Dittmar suggests that the extra time and paperwork required can be a burden on towns and on small contractors working on small jobs for them.

Protecting stream hydraulics

"Sizing is a critical issue for culverts," says Jim Morrissey, the Milwaukee-area DNR liaison. "Too fast a flow can quickly scour out stream bottoms and destroy spawning areas; too large a culvert can spread out the flow, making water too shallow for fish to pass."

You should not just replace a culvert with another of the same size, either. If upstream areas have changed from farmland to residential developments, there will be more runoff. Flooding may result. "You have to think about land use activity in the watershed which impacts the flow and velocity of stormwater," says Morrissey.

It's easy to think of streams, especially urban ones that only flow in wet weather, as just a pathway for moving water, but they often have a high degree of environmental value, Morrissey points out. It's a value that you can't necessarily recognize just by looking at them.



Too little, too late. Plan ahead for erosion control. Have all materials on site before you make the first soil cut. FDM Chapter 10 can tell you how (see Resources pg. 6)

DNR district transportation liaisons

Southern District
Fitchburg, Hal Meier,
608/275-3308,
Russ Anderson,
608/275-3467,
Tracy Eagan,
608/275-3324

Counties: Columbia, Dane, Dodge, Fond du Lac, Grant, Green, Green Lake, Iowa, Jefferson, Lafayette, Marquette, Richland, Rock, Sauk

Lake Michigan District
Green Bay,
Al Stranz,
414/492-5818,
Kelley O'Connor,
414/492-5819

Counties: Florence, Marinette, Menominee, Oconto, Shawano, Waupaca, Waushara (Stranz); Brown, Calumet, Door, Kewaunee, Manitowoc, Outagamie, Winnebago (O'Connor)

Western District
Eau Claire, Rob Strand,
715/839-1609,
Craig Thompson
608/785-9014

Counties: Chippewa, Clark, Dunn, Eau Claire, Pepin, Pierce, St. Croix (Strand); Buffalo, Crawford, Jackson, Monroe, La Crosse, Trempealeau, Vernon, (Thompson)

North Central District
Rhineland, Jim Grafelman,
715/365-8927

Counties: Adams, Forest, Juneau, Langlade, Lincoln, Marathon, Oneida, Portage, Vilas, Wood

Northwest District
Spooner, Diane Conklin, 715/635-4229, Bill Gantz, 715/635-4227, Dan Michels (DOT projects only), 715/635-4228

Counties: Ashland, Barron, Bayfield, Burnett, Douglas, Polk, Rusk, Sawyer, Washburn, Iron, Price, Taylor



This culvert was set too high. Brook trout cannot pass through it to spawning areas on this Class I trout stream.



This small ditching project dumped tons of sediment into the river because no erosion control was used. Simple tools like matting, silt fences, hay bales, and rock riprap would have helped protect the river's water quality.



Even small wetlands are valuable and protected. Dumping soil destroys them, and leaving the soil bare makes the situation worse. Local, state and national protection ordinances can require expensive repairs.

Southeast District
Milwaukee, Jim Morrissey, 414/263-8525, Vic Pappas, 414/263-8648
Counties: Kenosha, Racine, Walworth, Milwaukee, Waukesha (Morrissey), Ozaukee, Washington, Sheboygan (Pappas)

Note: DNR is reorganizing and some county contacts may change this fall. If you have trouble reaching the right person, please call Mike Neumann at DNR, 608/266-5428, fax: 608/267-5231.

Hal Meier from the Madison-area DNR office agrees: "A lot of people think that channelizing the stream is the best way to get water away from roads, but that just causes problems downstream. We want to keep stormwater on the land so it adds to our water table instead of going down the Mississippi River." In general, the goal is to install a culvert that maintains the stream's water velocity and direction with minimum interference.

Ditches also need care

When maintaining roadside ditches, it's important to recognize the power of moving water and the polluting effects of the sediment it carries. Plan ahead and start early for projects to grade shoulders, remove sediment from ditch bottoms, or reshape slopes and ditches. Local officials have new responsibilities for stormwater management under NR-216 of the Wisconsin Administrative Code. WisDOT has developed standards for erosion control and stormwater management in *Trans 201* (Wisc. Admin. Code). These may also help local officials. Here are some general guidelines to consider:

- Make an erosion control plan ahead of time and have erosion control materials on site before you open any soil
- Review plans with a DNR liaison and/or county highway staff person
- Consider the pitch of the ditch. Slow down water movement to let sediment drop out before the water enters a stream or pond
- Open as little soil as possible at any one time
- Use proper and effective erosion control
- Close raw soil immediately with mulch and plantings
- Remove dredged material and dispose of it in an appropriate upland site
- Protect wetlands. Don't park, pile, or dump there
- Remember to include plans for land next to ditches that may be disturbed by equipment or vehicles, or where you will pile soil or gravel

Chapter 10, Erosion Control, of the WisDOT Facilities Development Manual (FDM), has detailed descriptions of products and techniques that can be very helpful. Copies are \$5. See Resources for details.

Ditches can also be environmentally important. For example, northern pike around Green Bay migrate into spring-flooded roadside ditches to spawn in the grasses and gravel areas. Within two weeks, the eggs hatch, the tiny fish swim back downstream, and the water dries up. In addition, roadside ditches and intermittent streams everywhere in the state may be important spring spawning sites for minnows and other food fish.

"You should always check with the DNR on ditches, especially in our area," says Oconto County Highway Commissioner Mike Exferd. "Most any drainage ditch is classified as a stream and gets water out to Green Bay. We also have several ditches that are classified as wetlands."

Be sure to coordinate with the DNR liaison on ditch maintenance. He or she will tell you if any permits are required, whether there are any critical endangered resources in the area, what timing issues are involved, or if there are other problems.

Planning ahead and contacting a DNR liaison well before you start a culvert, bridge, ditching, or road rehabilitation process can protect you from the extra costs of fixing damages or re-doing projects later. Don't wait till your equipment or contractor is on site.

And when plans are set, be sure your work crews or contractors actually follow them.

Guidelines for effective erosion control are described in Trans 207, and in Chapter 10, Erosion Control of the WisDOT Facilities Development Manual. See the Resources section on page 6 for information on how to get copies. Gayle Stearn at WisDOT can answer questions on erosion control. Call her at 608/267-3766.

You can get the name and phone number of your county's DNR Transportation Liaison from the list at the left.