

Monitoring Program for Road Stream Crossing Remediation in the Bad River Watershed

The influence of road stream crossings on fish populations and stream habitats has received increased attention over recent years. Many agencies in our area are involved in fish friendly culvert replacements to ameliorate the negative impacts of road crossings. Local partners have replaced or remediated many culverts at road crossings over the last five years. These installations intend to benefit fish species and their habitats, however limited monitoring has been conducted to evaluate the effectiveness of these installations both at a specific project site and on an overall watershed basis.

In response, the Bad River Watershed Association and the Ashland Fish and Wildlife Conservation Office of the U.S. Fish and Wildlife Service are partnering to host a monitoring workshop on December 16-17, 2008. The purpose of this workshop is to develop a monitoring program and to draft monitoring protocols that will evaluate how well restoration work in the BRW is achieving program objectives.

At the workshop, participants will divide into one of two break-out groups that have either a fisheries or geomorphic focus. The purpose of these break-out sessions is to identify the appropriate parameters for our Monitoring Program in their respective area of expertise. First, participants will first review and modify (as needed) the questions and suggested spatial scales presented below for each objective. Then participants will consider watershed position (clay plain in the lower reaches, steep erodible transition zone, or upper watershed) to identify appropriate parameters for each monitoring question. Objectives, monitoring questions, and suggested spatial scales are presented below

Bad River Watershed Stream Crossing Goals, Objectives and Monitoring Questions

Culvert Program Goal: To restore naturally functioning stream channels throughout the Bad R. watershed.

Fisheries Break Out Group

Objective 1: Reconnect artificially fragmented stream and riparian systems, by focusing on poor road stream crossings

Monitoring Question	Spatial Scale
Is the existing crossing a barrier to upstream fish movement?	Site
Is the crossing a barrier after remediation?	Site
Have individual and species-specific fish ranges expanded with barrier removal?	Reach

Objective 2: Improve aquatic community health, especially fish populations by allowing access to rearing habitats, spawning habitats, and water quality refugia.

Monitoring Question	Spatial Scale
<ul style="list-style-type: none"> • What is the population (fish, mussels, macroinvertebrates) response to expanded habitat range at newly opened barriers? 	Subwatershed

Sediment Break-out Group

Objective 3: Restore or improve instream habitat and prevent accelerated sedimentation in streams at these crossings.

Monitoring Question	Spatial Scale
How far downstream does sediment move post installation?	Reach
How far upstream does entrenchment take place and for how long?	Reach
What are the channel changes in habitat, especially those that influence quality habitat?	Reach/ subwatershed
What are the downstream and upstream impacts of culvert installations on hydrologic changes (quantity and timing of stream flow) and hydraulic changes (physical parameters of stream and floodplain)?	Reach/ subwatershed

Additional questions for the monitoring workshop?

- Are there specific research questions that need to be answered?
- What baseline inventory data do we have and what are the baseline inventory needs?
- Can we incorporate existing baseline inventory data (water quality, macroinvertebrate) into this monitoring approach? If so, how?
- Are there other issues/impacts we should monitor, such as contaminant movements (in both fish and sediments), sea lamprey expansion or disease movement?
- What are we missing?