

58

A Long-term, Monitoring-intensive Approach to Pacific Northwest Watershed Restoration

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The Pacific Northwest region is spending hundreds of millions of dollars to restore watershed ecosystems and recover diminishing populations of native salmon and trout. However, there is much debate regarding whether current restoration methods are capable of producing desired ecological improvements (Roni and others 2002). The scientific community has long advocated that the region establish watershed-scale restoration strategies and apply the monitoring and evaluation systems necessary to facilitate an adaptive, results-based approach (Roper and others 1997). Unfortunately, widespread application of these recommendations has not yet occurred (Bolton and others 2002).

Between 1999-2002, the Bonneville Environmental Foundation (BEF) awarded one- to two-year grants to community-based organizations to promote adaptive, science-based watershed restoration across the Pacific Northwest. In 2003, we reviewed the results of previously funded projects and concluded that our own short-term funding for watershed restoration was ineffective. It

tended to encourage piecemeal, site-specific projects, while discouraging sustained monitoring and an adaptive, watershed-scale approach.

Consequently, we began an experiment to determine if long-term funding and a commitment to support monitoring and evaluation would enhance our grantees' capacity to employ scientific and adaptive restoration strategies. To this end, we proposed a ten-year commitment to provide funding for monitoring and evaluation, sustained technical support, and independent peer review services to select watershed groups willing to meet our criteria. To date, BEF has developed and committed ten-year funding support to five "Model Watersheds" in Oregon, Washington, and Idaho.

Under the new Model Watershed approach, BEF requires that each prospective grantee develop a minimum ten-year, watershed-scale restoration and monitoring plan that:

- Sets specific and measurable ecological restoration objectives at the outset.
- Establishes a comprehensive monitoring program upfront.
- Identifies a ten-year series of coordinated actions necessary to restore ecosystem processes and address causes of habitat degradation.
- Establishes a timetable to guide systematic evaluation of restoration progress and adjust restoration strategies according to results.
- Integrates regular review from an independent science team.

Our newest Model Watershed is located in Oregon's Upper Deschutes River Basin. Our partners in the project, the Crooked River and Upper Deschutes Watershed Councils, have established specific and measurable goals for restoring water quality, stream flow, habitat complexity, fish passage, macro-invertebrate richness and diversity, floodplain and riparian function, native fish populations, and upland conditions. In addition, project sponsors have established a ten-year monitoring strategy and will integrate data from tribes, utilities, and agencies to produce annual reports that track progress towards stated restoration objectives. Coordinated monitoring activities include macro-invertebrate sampling, flow gauging, juvenile fish surveys, repeat photo points, water quality monitoring, spawning surveys, outmigrant trapping of juvenile fish, and stream habitat and riparian surveys. At present, BEF has committed \$300,000 to support this program during the next ten years.

In our experience, community-based restoration programs rarely develop or sustain the capacity to measure restoration effectiveness and track progress towards attaining long-term ecological objectives. Consequently, BEF's existing Model Watersheds exhibit several important advantages when compared to conventional, short-term restoration initiatives: 1) they establish a coordinated, long-term strategy to restore natural watershed processes and functions, rather than focusing on piecemeal, site-

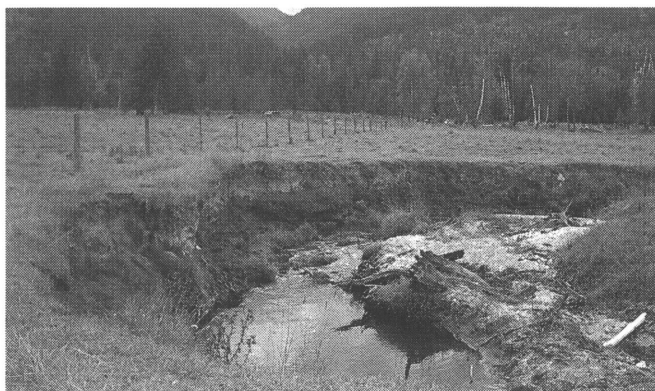


Figure 1. A severely eroded meander bend on Trout Creek in 2002 (left) and in 2006 (right), after restoration. The Kootenai Tribe of Idaho worked with private landowners to install exclusionary fencing, establish off-stream livestock watering sites, plant native riparian vegetation, and place woody debris along eroding stream banks. Trout Creek is a tributary to the lower Kootenai River in far northern Idaho and is part of the Bonneville Environmental Foundation's ten-year lower Kootenai River Model Watershed program in partnership with the Kootenai Tribe. Photos by Gretchen Kruse

specific interventions; 2) they have institutionalized a long-term monitoring strategy funded by BEF, rather than relying on sporadic and inconsistently funded monitoring; 3) they are evaluating progress according to measures of ecological change, rather than using outputs (for example, number of trees planted) to define success; and 4) they are poised to use measured results to guide restoration planning and implementation rather than implementing projects derived from assumptions of effectiveness.

The economics of the ten-year approach have forced BEF to suspend short-term grant making. Instead of expending available program funding on a wide range of short-term projects each year, we now reserve annual grant funding until we are able to commit long-term financial support to a new Model Watershed project. With each new project, we develop a flexible ten-year disbursement schedule and then perform annual due diligence reviews to guide the allocation of reserved funding.

Thus far, staff turnover, funding shortfalls, and divergent social perspectives have threatened to disrupt the continuity (and effectiveness) of established Model Watershed programs. In addition, we have observed that Model Watershed restoration and monitoring strategies require continuous review and adjustment in order to achieve desired results. Collectively, the challenges experienced to date have reinforced our assumption that dedicated institutional support and sustained funding for monitoring and evaluation are essential to maintaining an efficient, accountable, and scientific restoration approach.

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