Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY

Idaho

Removing Forest Roads and Restoring Streams Reduces Sediment in Yellowdog Creek

Waterbody Improved

Eroding forest roads had contributed excessive sediment to northern Idaho's Yellowdog Creek. As a result, the Yellowdog Creek assessment unit, encompassing 12.2 stream miles, was added to the state's 1994 Clean Water Act (CWA) section 303(d) list for sediment impairment. Beginning in 2000, the U.S. Forest Service (USFS) removed or repaired failing roads, restored riparian areas and implemented in-stream habitat improvement projects. Sediment loads in Yellowdog Creek have declined, and monitoring results show that sediment no longer impairs cold-water aquatic life such as the native westslope cutthroat trout. Therefore, the Idaho Department of Environmental Quality (DEQ) will propose removing the Yellowdog Creek assessment unit from the state's list of impaired waters in 2012 for sediment.

Problem

The 7.8-square-mile Yellowdog Creek watershed is in the North Fork Coeur d'Alene River Subbasin, which drains the west flank of Idaho's Bitterroot Mountain Range in the northern Rocky Mountains (Figure 1). Idaho Panhandle National Forests manages the entire Yellowdog Creek watershed.

Intensive timber harvest and road building occurred through much of the North Fork Coeur d'Alene River Subbasin from 1890 until the early 2000s. A dense network of roads was constructed, including some roads that were spaced 300 feet apart across hillsides to accommodate "jammer logging," a system in which logs are pulled with cables from the cutting area to a collection point. Access roads were often built directly adjacent to streams. Historically, sediment inputs from forest roads were excessive. Even after active logging ceased, runoff and floodwaters continued to erode and wash out roads, particularly those near or adjacent to streams.

Water quality investigations in the early 1990s suggested that sediment inputs were impairing cold-water aquatic life in Yellowdog Creek. As a result, the Yellowdog Creek assessment unit (12.2 stream miles) was added to the 1994 CWA section 303(d) list for sediment. To confirm sediment impairment, in 1996 DEQ completed a Beneficial Use Reconnaissance Program (BURP) wadeable streams rapid bioassessment on two Yellowdog Creek sites, which yielded low scores for both the stream habitat index (SHI) and stream macroinvertebrate index (SMI). Because fish were not sampled, the stream fish index (SFI) could not be calculated. The middle site had an SHI score of 1 and an SMI score of 0, for an average score of 0.5; the lower site had an SHI score of 2 and an SMI score of 1, for an average score of 1.5. Index scores at both sites failed to meet the minimum average score of 2.0 that would have indicated full support of cold-water aquatic life according to DEQ's *Water Body Assessment Guidance*. When DEQ completed a total maximum daily load (TMDL) for the North Fork Coeur d'Alene Subbasin in 2001, the TMDL study identified erosion from road encroachment as the subbasin's largest sediment source.

Figure 1. The Yellowdog Creek watershed is in the North Fork Coeur d'Alene River Subbasin in northern Idaho. USFS, as part of its extensive restoration efforts, removed a 2-mile-long road from the riparian area, added large woody debris and restored riparian and in-stream habitat.

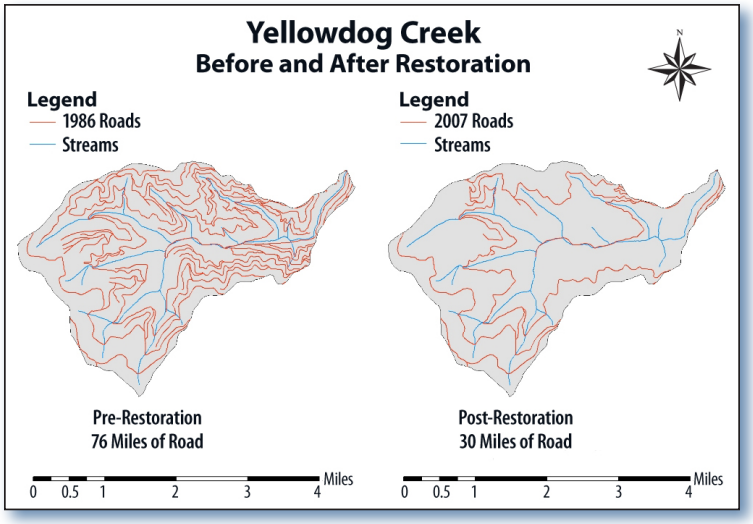

Figure 2. Road density declined following road decommissioning in the Yellowdog Creek watershed.

Project Highlights

The DEQ Nonpoint Source Management Program developed a statewide Nonpoint Source Management Plan in 1999. The plan included a memorandum of understanding between state and federal agencies that encouraged restoration on federal lands. In accordance with the plan, USFS implemented numerous restoration projects in the Yellowdog Creek watershed from 2000 to 2006. USFS decommissioned 46 miles of roads in the watershed (60 percent) and removed 111 stream crossings (Figure 2). The projects reduced sediment loads by stabilizing eroding streambanks and revegetating road surfaces and riparian areas. The most significant improvements occurred in the lower watershed, where USFS removed two miles of road directly adjacent to the stream. USFS restored the streambanks and riparian areas, placed 765 logs in the channel and used boulders to construct more than 100 pool-forming structures (see Figure 1). The structures (1) helped to stabilize the stream by providing additional grade control and (2) created cold-water aquatic life habitat by providing cover (hiding places) and increased channel complexity (different types of habitat in the same area).

Results

In 2008 DEQ and USFS initiated a state-mandated TMDL five-year review of Yellowdog Creek (and other watersheds within the North Fork Coeur d'Alene River Subbasin). In phase one, the partners selected 19 watersheds that had undergone extensive restoration work and then performed modeling and geographic information system analyses to evaluate which ones had likely made significant progress toward meeting the sediment TMDL goals. The model indicated that sediment loads in Yellowdog Creek had declined by an estimated 44 percent between 1986 and 2007, which prompted further study.

In the second phase of the TMDL review, DEQ and USFS verified modeling results in eight watersheds (including Yellowdog Creek watershed) using DEQ's BURP assessment and USFS' PACFISH/INFISH Biological Opinion (PIBO) Effectiveness Monitoring Program protocols. BURP data collected near the mouth of Yellowdog Creek in 2009 showed that the SHI, SMI and SFI scores had each improved to scores of 3, 3 and 2, respectively, for an average score of 2.7. Macroinvertebrate sampling showed an increase in diversity and included species associated with cold, clear mountain streams. The fish survey detected sculpin, westslope cutthroat trout and longnose dace—all native species associated with good water quality.

The BURP index scores and PIBO data on physical habitat, temperature and macroinvertebrates indicate that Yellowdog Creek fully supports cold-water aquatic life with respect to sediment. Following restoration, sediment loading is now within the assimilative capacity of the stream, based on modeling and post-restoration monitoring results. On the basis of these data, DEQ will propose removing the Yellowdog Creek assessment unit from the state's list of impaired waters in 2012 for sediment. The assessment unit will remain listed for a temperature impairment, which was added in 2010.

Partners and Funding

USFS spent approximately $1 million in funding collected from timber sale receipts on restoration projects in the Yellowdog Creek and the adjacent Downey Creek watersheds. Numerous partners collaborated with USFS on planning and implementation, including the Army Corps of Engineers, Idaho Department of Water Resources, Idaho Department of Fish and Game, DEQ, North Idaho Fly Casters and the Kootenai Environmental Alliance. Partners in the TMDL five-year review included the USFS Idaho Panhandle National Forests Coeur d'Alene River Ranger District, the USFS PIBO Effectiveness Monitoring Program, DEQ's Coeur d'Alene Regional Office, the U.S. Environmental Protection Agency and the North Fork Coeur d'Alene River Watershed Advisory Group.

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-11-001RR
December 2011

For additional information contact:

Kajsa Eagle Stromberg, Idaho Department of Environmental Quality, Coeur d'Alene Regional Office
208-769-1422 • kajsa.stromberg@deq.idaho.gov

Chris James, Idaho Panhandle National Forests
Coeur d'Alene River Ranger District
208-769-3030 • cjjames@fs.fed.us