



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Idaho

Watershed Restoration Decreases Sediment Levels and Improves Fish Habitat in Upper Tepee Creek

Waterbody Improved

Excessive sedimentation from eroding forest roads impacted cold-water aquatic life in Idaho's Upper Tepee Creek. As a result, the waterbody assessment unit was added to the state's 1994 Clean Water Act (CWA) section 303(d) list of impaired waters for sediment. Since the 1990s, watershed stakeholders, led by the U.S. Forest Service–Idaho Panhandle National Forests (USFS), have removed or repaired failing roads and restored stream habitat. These activities have greatly reduced sediment levels, improved aquatic habitat and enhanced an important cutthroat trout fishery. As a result, the Idaho Department of Environmental Quality (DEQ) has proposed to remove the Upper Tepee Creek assessment unit from the state's list of impaired waters in 2012 for sediment.

Problem

The Upper Tepee Creek watershed is in the headwaters of the North Fork Coeur d'Alene River Subbasin in the northern Rocky Mountains of Idaho. The watershed lies within the boundaries of the Idaho Panhandle National Forests, but some of the land is privately owned. The Upper Tepee Creek assessment unit (ID17010301PN020_02) includes the watershed's first- and second-order streams (Figure 1).

Intensive timber harvesting and associated road-building occurred in the watershed from the 1930s to the 1990s. Culvert failures and eroding roads (particularly at stream crossings and in riparian areas) contributed large amounts of sediment to streams. In the early 1990s, riffle stability studies and other habitat data were used to determine that cold-water aquatic life was impaired due to sediment; as a result, the assessment unit (a total of 49 miles) was added to the 1994 CWA section 303(d) list. The suspected source of excess sediment was erosion from forest roads.

In 1996 DEQ conducted biological monitoring under the Beneficial Use Reconnaissance Program (BURP) at two sites in Big Elk Creek. BURP data showed a low diversity of macroinvertebrates in upper Big Elk Creek, confirming that the streams should remain listed as impaired by sediment. A 2001 subbasin assessment further confirmed the sediment impairment based on available biological data and riffle armor stability index values.

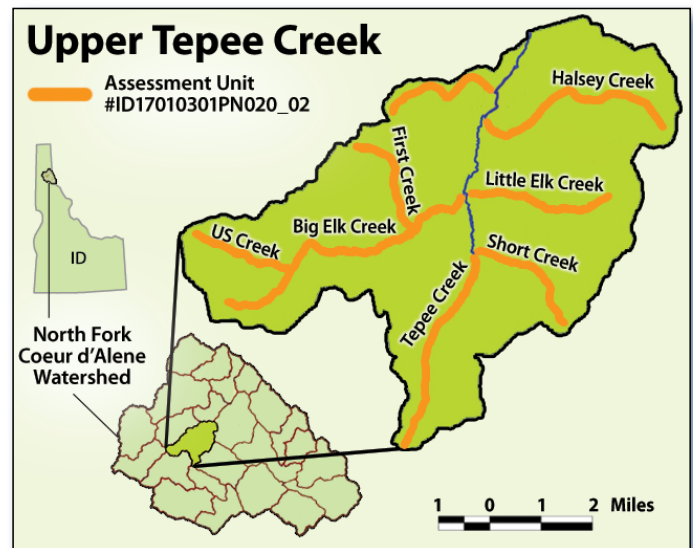


Figure 1. Idaho's Upper Tepee Creek assessment unit includes the watershed's first- and second-order streams, totaling 49 miles. (Note: some smaller tributaries comprising assessment unit do not appear on map).

In 2001, DEQ completed sediment total maximum daily loads (TMDLs) for the North Fork Coeur d'Alene River Subbasin, which included the Upper Tepee Creek assessment unit. The TMDL established a sediment load target of 1.5 times the natural background sediment load, which meant that sediment loads needed to be reduced by approximately 21 percent to support cold-water aquatic life.

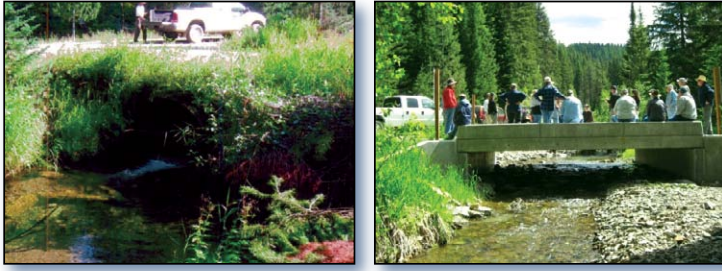


Figure 2. Project partners replaced an undersized culvert that had partially blocked fish passage (left) with a bridge (right) on lower Short Creek in 2010.

Project Highlights

Beginning in the 1990s, the USFS and its partners implemented numerous restoration projects. The USFS restored 17 stream crossings on 12 miles of road in the Big Elk Creek tributary watershed. In 1999 and 2000, the USFS decommissioned an additional 35 miles of road and treated 69 channel crossings. The projects included planting trees and placing woody debris at stream crossings and on treated roads.

Restoration continued into 2010 along tributaries to Upper Tepee Creek (Riley and Short creeks). The USFS and the North Idaho Fly Casters, with the support of other partners, led a project to decommission 18 miles of road, remove 19 culvert crossings, plant riparian areas and improve in-stream habitat (Figure 2). The projects reduced the amount of sediment and, in some cases, removed barriers to upstream spawning habitat.

Results

In 2008 DEQ worked with the North Fork Coeur d'Alene River Watershed Advisory Group (WAG) and the USFS to review the subbasin's sediment TMDLs. Because stakeholders had performed extensive restoration and TMDL implementation work in Upper Tepee Creek, project partners identified the need for post-project monitoring to assess water quality improvement. DEQ and USFS used modeling and geographic information system analyses to estimate the sediment load reductions achieved since the TMDLs were established. The model suggested that restoration projects reduced the estimated annual sediment load by 22 percent, exceeding the target of 21 percent prescribed by the TMDL.

To validate the modeled results, USFS and DEQ conducted biological monitoring on Big Elk Creek in 2009. Crews used DEQ's BURP protocols and USFS' PACFISH/INFISH Biological Opinion (PIBO) Effectiveness Monitoring Program protocols to collect information about the biological, chemical and physical condition of the streams. BURP data collected near the mouth of Big Elk Creek in 2009 yielded an average score of 2.0. The site meets the minimum average score of 2.0 required to support cold-water aquatic life according to DEQ's *Water Body Assessment Guidance*.

Macroinvertebrate sampling collected in 2009 in Big Elk Creek showed good diversity and included species associated with cold, clear mountain streams. Fish surveys detected westslope cutthroat trout and sculpin, both native species associated with good water quality. Fish population monitoring conducted by the Idaho Department of Fish and Game in Upper Tepee Creek has shown an increase in cutthroat trout densities in the past 10 years—from almost no fish in 2001 to more than 1.5 fish per 100 square meters in 2011.

Modeling and post-restoration data indicate that the streams in the Upper Tepee Creek assessment unit fully support cold-water aquatic life with respect to sediment. As a result, DEQ has proposed to remove the Upper Tepee Creek assessment unit (49 miles) from the state's list of impaired waters in 2012 for sediment. The assessment unit will remain listed for temperature impairment, although the riparian planting projects of the past decade should help to increase shade in the future.

Partners and Funding

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 (EPA) and the North Fork Coeur d'Alene River WAG. Multiple partners provided funds to restore the headwater tributaries of Tepee Creek, including the USFS (\$195,000 in funding collected from timber sale receipts), the National Fish and Wildlife Foundation (\$55,090), the Idaho Department of Fish and Game (\$180,000), North Idaho Fly Casters, EPA's CWA section 319 program (\$20,000), the National Interagency Fire Center (in-kind and matching funds: \$13,333), and a combination of the President's Fund (special funding for watershed restoration work) and special appropriated watershed funds (\$106,000).



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