



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Montana

Reducing Sediment from Logging Areas Improves the Swift Creek Watershed

Waterbodies Improved

Erosion from logged areas and poorly maintained roads caused three segments in the Swift Creek watershed (East Fork Swift Creek, West Fork Swift Creek, and the Swift Creek main stem) to fail to support their aquatic life and cold water fisheries designated uses. As a result, the Montana Department of Environmental Quality (MDEQ) added the three segments to the state's Clean Water Act (CWA) section 303(d) list of impaired waters in 1996. Implementing logging best management practices (BMPs) and improving roads have improved water quality. Recent data show that Swift Creek fully meets its aquatic life and cold water fisheries uses, prompting MDEQ to remove all three segments from the state's impaired waters list in 2012.

Problem

The Swift Creek watershed covers approximately 120 square miles in northwestern Montana. The east and west forks of Swift Creek join to form the Swift Creek main stem, which then flows in a southeasterly direction before entering Whitefish Lake near Whitefish, Montana (Figure 1). The Stillwater State Forest manages 83 percent of the watershed; most of the remaining 17 percent of land is managed by the Flathead National Forest and private timber companies. Swift Creek provides spawning habitat for the bull trout, an endangered species.

Runoff from historically logged areas and poorly maintained roads contributed excess pollutant loads to the watershed's streams and rivers. The soils in the vicinity of streams are composed of reworked glacial sediments, generally unconsolidated gravely loams and gravely silt loams, and they are easily eroded under both natural and altered landscape conditions.

Data collected after 1976 showed that total phosphorus (TP) levels had exceeded 50 micrograms per liter ($\mu\text{g/L}$) numerous times. These data, along with observed high rates of erosion, prompted MDEQ to identify all three segments of Swift Creek (Swift Creek main stem, East Fork Swift Creek, and West Fork Swift Creek) in 1989 as impaired for not fully supporting the aquatic life and cold water fisheries designated uses due to high levels of nutrients (East Fork and main stem Swift Creek only) and sediment. As a result, MDEQ added the three segments to Montana's 1996 CWA section 303(d) list of impaired waters. The probable impairment sources included silviculture and roads.

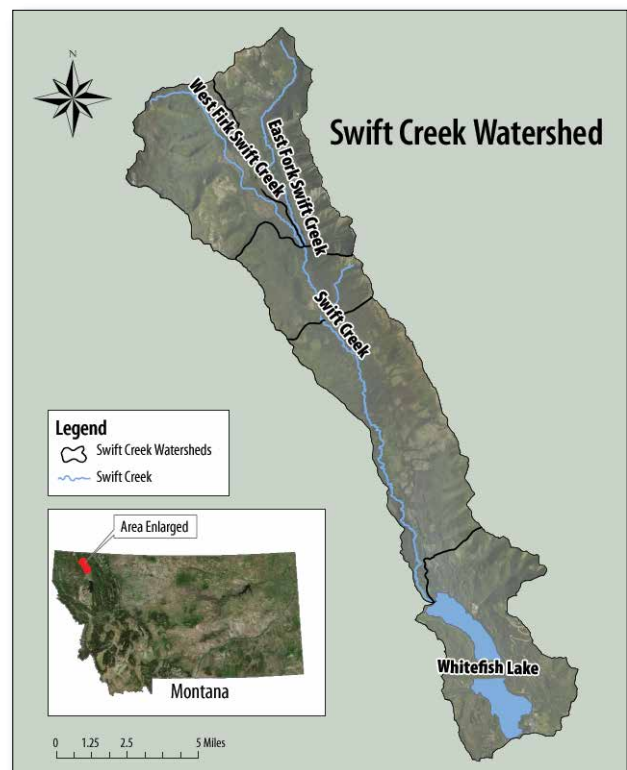


Figure 1. Swift Creek is in northwestern Montana.

Project Highlights

In the early 1990s the Montana legislature passed two state regulatory authorities that helped to reduce the water quality impacts from timber harvesting and forestry operations. The Forestry Best Management Practices (BMP) Notification Law (1989) requires landowners and operators to notify



Figure 2. Projects partners installed bridges over Swift Creek to reduce sediment.

the state before conducting forest practices on private lands to ensure that BMPs are adopted to minimize nonpoint source pollution. The Streamside Management Zone (SMZ) Law (1991) regulates forest practices along streams to protect and maintain the SMZ (i.e., the riparian area), which serves as a natural filter of vegetation.

Logging still occurs in the watershed, but the Stillwater State Forest, Flathead National Forest, and Plum Creek Timber Company have native fish habitat conservation plans in place to help them protect the more sensitive riparian areas and evaluate environmental impacts before logging. The forest landowners have continued to improve road infrastructure since the early 1990s.

Since 2003 MDEQ has cooperated with the Swift Creek Coalition and the Whitefish County Water and Sewer District on a phased approach to total maximum daily load (TMDL) development and watershed restoration for the Flathead Stillwater watershed, which includes Swift Creek. The Whitefish County Water and Sewer District secured three CWA section 319 grants (in 2002, 2003, and 2005) that supported monitoring water quality, reviewing existing data, and developing and implementing restoration activities. The restoration activities included replacing approximately 15 culverts and three bridges designed to reduce sediment from target areas in the Swift Creek watershed (Figure 2). In addition, two pollutant-source studies conducted on behalf of the Swift Creek Coalition helped to identify and quantify pollutants from natural sources and human-caused activities.

Results

Montana's nutrient criteria for the Northern Rockies Ecoregion are $30 \mu\text{g/L}$ for TP and $300 \mu\text{g/L}$ for total nitrogen (TN) for the July 1–September 30 growing season. In 2008 MDEQ reviewed existing data from all monitoring stations (one on each segment, one at the downstream end of Swift Creek, and one on a tributary) and found that TP levels were consistently below $30 \mu\text{g/L}$ at all the sites. The same report also found TN values were well below $300 \mu\text{g/L}$ and generally below $100 \mu\text{g/L}$. The review showed that chlorophyll *a* data collected in 2003 on all segments ranged from 14.1 to 71 milligrams per square meter (mg/m^2), well below the criterion of 125 mg/m^2 established for the ecoregion.

In addition, a review of sediment data from 1997 (after forestry-related laws were enacted) through 2007 showed that fine sediment (less than 6.35 millimeters in diameter) on the stream bottom ranged from 30.3 to 33.7 percent. These values are below the 35 percent threshold value at which Montana Fish, Wildlife, and Parks and the U.S. Forest Service consider bull trout spawning to be threatened. Additionally, pool frequency (eight to 15 pools per 1,000 feet), large woody debris (19–213 instances per 1,000 feet), and stream width-to-depth ratios (measured ranging from 12.7 to 22.1) fell within the range of expected conditions for streams fully supporting the aquatic life use.

MDEQ performed a water quality reassessment using all existing data in 2009–2011 and determined that the three segments fully support their aquatic life and cold water fisheries designated uses. As a result, MDEQ removed all three—East Fork Swift Creek (MT76P003_030, 9.18 miles), West Fork Swift Creek (MT76P003_040, 9.53 miles), and Swift Creek (headwaters to mouth; MT76P003_020, 17.28 miles)—from the state's list of impaired waters in 2012.

Partners and Funding

The major partners included MDEQ, the Montana Department of Natural Resources and Conservation (DNRC), the Plum Creek Timber Company, the Swift Creek Coalition, and the Whitefish County Water and Sewer District. MDEQ provided a total of \$130,000 of CWA section 319 funds, much of which supported watershed assessment work and water quality restoration plan development. The Plum Creek Timber Company, the U.S. Forest Service, and DNRC used their own funding to implement road and logging restoration and forestry management activities.



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