



NONPOINT SOURCE SUCCESS STORY

Montana

Projects Reduce Sediment from Forest Roads in Jim Creek in the Swan Lake Watershed

Waterbody Improved

Jim Creek was listed as impaired by sediment in 1996. Total maximum daily loads (TMDLs) were completed for the Swan Lake watershed by Montana Department of Environmental Quality (DEQ) in 2004 for Swan Lake, Goat Creek and Jim Creek. Swan Lake aquatic life use is threatened by particulate organic carbon and is linked to low summer dissolved oxygen levels in the deeper parts of the lake. Since the TMDLs were developed, the Swan Ecosystem Center (now Swan Valley Connections) has worked with Flathead National Forest, Department of Natural Resources and Conservation state trust lands, Plum Creek Timber, DEQ and other partners to develop and implement a watershed-based plan. Numerous Clean Water Act (CWA) section 319 projects have been implemented, focusing on forest road-generated sediment reductions. In 2015 and 2016 the Montana DEQ collected sediment-related data in Jim Creek and completed an assessment in March 2017, with an outcome of a proposed 2018 de-listing sediment/siltation as a cause of impairment in Jim Creek.

Problem

Jim Creek, a 12-mile-long stream in northwest Montana's Swan Lake watershed was listed as impaired by sediment in 1996 based on Montana's narrative standard (Figure 1). The standard does not allow increases above naturally occurring sediment concentrations that will or are likely to harm aquatic life or other beneficial uses.

TMDLs were developed for three waterbodies (Swan Lake and Jim and Goat creeks) in 2004. Sediment sources were identified as road erosion, riparian and streambank erosion, and other timber harvest activities. Sediment targets (channel substrate fines, pools with cover, large woody debris, and macroinvertebrate community metrics) were established for Jim Creek as part of the TMDL process. TMDL restoration strategies included application of best management practices (BMPs) to existing forest roads, riparian and stream bank protection from existing and future private (non-timber) development, and application of forestry BMP practices, including the Streamside Management Zone.

Bull trout and grizzly bear, both listed under the Endangered Species Act, are found in the 408,630-acre Swan Lake watershed, which is classified as part of the Northern Rocky Mountain ecoregion.

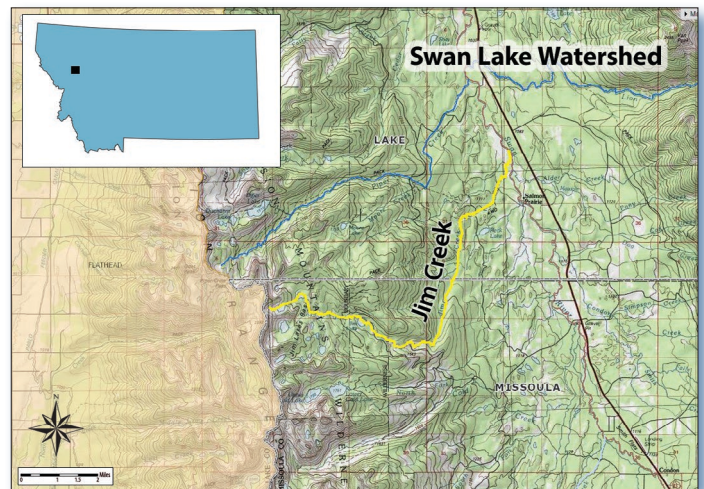


Figure 1. Jim Creek is in the Swan Lake watershed.

Project Highlights

The 12,512-acre Jim Creek watershed was the focus of two CWA section 319 projects (2006 and 2012) that implemented forest road BMPs, including cross drains, rolling dips, flapper bars, blading and reshaping roadway surfaces, upsizing and replacing culverts, active and passive road decommissioning, and road realignment. Since the TMDLs were developed, Swan Valley Connections (SVC) has been awarded seven

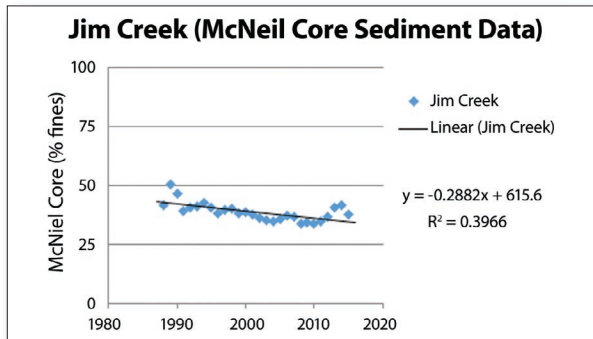


Figure 2. Regression trend line shows that percent fines have declined over time.

CWA section 319 contracts, addressing sediment sources throughout the Swan Lake watershed, with an emphasis on the forest roads network—the largest anthropogenic source of sediment in the watershed. SVC developed a Quality Assurance Project Plan in 2008, and a Watershed Restoration Plan in 2009 that was updated in 2012. Between 2010 and 2017, SVC has implemented 10 wetland, stream or riparian restoration projects on nine privately owned parcels (92 acres) and one on public land (12 acres) that were funded by sources other than the CWA section 319 program.

Other factors contributing to sediment reduction include state regulatory requirements. In 1989 Montana passed the BMP Notification Law, which requires landowners to notify Montana Department of Natural Resources and Conservation (DNRC) prior to harvesting timber. DNRC foresters provide technical assistance on proper harvesting techniques and BMP implementation. In 1991 Montana enacted the Streamside Management Zone Law, which requires, among other things, that a riparian buffer of at least 50 feet from each bank be maintained during commercial timber harvesting. These two laws have significantly improved implementation of forestry practices designed to protect water quality.

Results

With support by CWA section 319 and state and local match funding, SVC has reported a sediment reduction of 159 tons per year in the Swan Lake watershed. Additionally, the Montana Department of Transportation has decreased their application of traction sand along 47 miles of state highway 83 through the Swan Valley, from about 500 pounds to



Figure 3. Lower Jim Creek, seen here in 2013, now meets Montana's narrative sediment standard.

250 pounds per road mile per year. Projects in the Jim Creek watershed have resulted in an estimated sediment reduction of 33 tons per year, a 24 percent decrease from the estimated 135 tons per year total sediment load. Sediment sampling has shown that the percent of sediment fines in the Jim Creek channel substrate have declined (Figure 2).

Macroinvertebrate and periphyton algae sampling yielded results that indicate a high level of biological integrity on Jim Creek. The three macroinvertebrate samples had an average Hilsenhoff biotic index value of 1.96 (range: 1.84-1.97). The single periphyton sample yielded a sediment taxa probability of impairment of 16 percent, well within the target of less than 51 percent. Because Jim Creek is now meeting the state's narrative standard for "...naturally occurring concentrations of sediment or suspended sediment," MDEQ is proposing to remove the sediment/siltation impairment from Jim Creek in 2018 (Figure 3).

Partners and Funding

SVC has provided the leadership, coordination, management and administration for TMDL implementation in the watershed. Major partners include the Flathead National Forest; the DEQ; DNRC; the Swan Lakers and Flathead Biological Station; the Montana Department of Fish, Wildlife and Parks; and the Montana Department of Transportation. A total of \$390,260 in CWA section 319 funds has supported on-the-ground BMPs, planning, monitoring, coordination, and education and outreach activities in the watershed. State and local match has totaled \$716,029, and the Flathead National Forest has reported \$1,262,639 in project contributions.



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