



NONPOINT SOURCE SUCCESS STORY

Colorado

Restoration of Straight Creek along I-70 at the Continental Divide

Waterbody Improved

Hillslope erosion and traction sanding on Interstate 70 (I-70) west of Denver contributed sediment-laden runoff to Straight Creek.

In 1998 the Colorado Water Quality Control Commission determined that Straight Creek was water quality impaired by sediment and placed it on the Clean Water Act (CWA) section 303(d) list of impaired waters. This was one of the earliest 303(d) lists for the state and the subject of the first sediment total maximum daily load (TMDL) report in 2000. In cooperation with many partners, numerous innovative best management practices (BMPs) were implemented that successfully reduced sediment runoff in this high alpine watershed. Monitoring data confirmed improved water quality and attainment of the sediment water quality standard for aquatic life use. Straight Creek was identified as Category 1-Attaining in the Colorado 2018 Integrated Report.

Problem

Straight Creek (COUCBL18_B) is an important water source about 50 miles west of Denver along I-70 between the Eisenhower-Johnson Memorial Tunnels and the town of Silverthorne (Figure 1). It drains about 20 square miles and ranges from approximately 13,000 feet at the Continental Divide to 8,800 feet at its confluence with the Blue River, which is prized for fishing and recreation opportunities. It serves as a direct water supply for the town of Dillon and Dillon Valley Metro District, provides replacement flows for Denver Water, and replenishes groundwater for Silverthorne drinking water wells.

The high-altitude I-70 highway is subject to harsh winter weather conditions and must be intensively maintained. Studies have shown that sediment entered Straight Creek from eroding cut-and-fill slopes along the I-70 corridor and traction sand applied directly to the roadway. Straight Creek was listed as impaired for sediment in 1998. Solutions had to be found that would address the water quality impairment while ensuring the transportation corridor remained open and safe for travel.

Story Highlights

Since construction of I-70 began in 1963, excess sediment had built up. This required decades of sediment reduction, sand removal, and flushing of sediment already in the Straight Creek valley. A 1990 environmental assessment identified options for

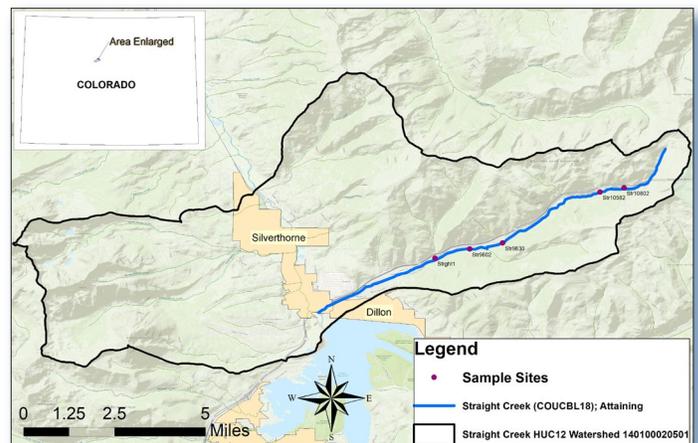


Figure 1. Straight Creek is in central Colorado.

building and maintaining sediment ponds. The Straight Creek Cleanup Committee (SCCC) was created in 1991 to coordinate with local communities, Colorado Department of Transportation (CDOT) and the landowner (U.S. Forest Service [USFS]).

Following the sediment impairment listing in 1998, the TMDL report was developed and included water quality indicator targets for median sediment size, pool velocity, channel cross-section stability and the number of fish age classes. The TMDL report identified runoff of applied traction sand and erosion of I-70 cut-and-fill slopes as the main sediment sources. In response, CDOT developed a 2002 Sediment Control Action Plan for the Straight Creek I-70 corridor that served as the main planning document for BMP implementation.

The strong partnerships within SCCC and their long-term commitment to restoring Straight Creek continued for over 20 years. New sediment controls constructed with CWA section 319 assistance included sediment control barriers and traps, clean water diversions, culvert enhancements, sediment ponds, and a concrete “snow slide” to hold sediment that melts out of snow pushed over the fill-slope edge (Figure 2). The Colorado Department of Health and the Environment’s Water Quality Control Division (WQCD) Nonpoint Source Program regularly coordinated with local project sponsors; CDOT provided matching funds and coordinated construction activities.

Results

The SCCC regularly monitored TMDL water quality targets starting in 1992, including long-term monitoring and data assessment by the Northwest Colorado Council of Governments (NWCCOG). The USFS began monitoring for sediment size and macroinvertebrates in 2007. This expanded evaluation looked beyond the TMDL targets and was based in part on recently updated WQCD guidance for assessing sediment impairment in mountain streams.

Data collected in 2016 (Figure 3) show that Straight Creek attains the aquatic life use-based sediment criteria established to assess the narrative sediment standard (Water Quality Control Commission Policy 98-1). All Sediment Tolerance Indicator Value (TIV_{SED}) scores and percent fines measurements, which range from 3.5 to 5.0 and from 2.2% to 21.1%, respectively, are below the corresponding thresholds for Sediment Region 1 (threshold TIV_{SED} = 6.1 and percent fines = 27.5%). Conditions at the sampling sites are similar to the range of conditions used to establish the expected condition for this region. As a result, in 2017, Colorado determined that Straight Creek met the aquatic life use-based sediment criteria and identified the creek as attaining the standard in the 2018 Integrated Water Quality Monitoring and Assessment Report.

Partners and Funding

Primary members of the SCCC are NWCCOG, Summit Water Quality Committee, CDOT Engineering, CDOT Maintenance, towns of Silverthorne and Dillon, Dillon Valley Metro District, Buffalo Mountain Metro District, USFS Dillon Ranger District, Colorado Parks



Figure 2. A snow slide BMP was constructed along I-70.

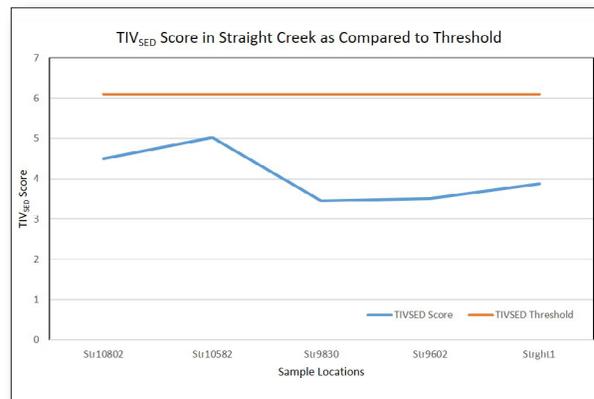


Figure 3. 2016 Sediment Tolerance Indicator Value (TIV_{SED}) scores along Straight Creek.

and Wildlife, Denver Water, WQCD, Summit Daily Newspaper and various private consultants.

CDOT estimated the overall cost of the BMPs to be over \$10,800,000. Studies and monitoring efforts cost more than \$150,000, including \$30,000 provided to NWCCOG through CWA Section 604(b) grants and \$30,000 in SCCC match. Maintaining these structures, including removing and disposing of sediment by both CDOT maintenance staff and contractors, totals approximately \$1.6 million since Fiscal Year 2000. CWA Section 319 project funds were awarded in grant years 1992, 2003, 2004, and 2006 for a total of \$715,500 with reported matching funds of approximately \$1.1 million. Continued commitments from all partners for monitoring progress and maintenance of the BMPs is necessary to protect water quality in Straight Creek.



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

EPA 841-F-20-00100
December 2020

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