Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Wyoming

Stakeholders Collaborated to Reduce Sediment in Creek

Waterbody Improved

Excessive sediment degraded habitat and threatened aquatic life and coldwater fisheries uses in Sage Creek, prompting the Wyoming Department of Environmental Quality (WDEQ) to add it to the state's 1996 Clean Water Act (CWA) section 303(d) list. A diverse stakeholder group led by the Saratoga-Encampment-Rawlins Conservation District (SERCD) responded by implementing several best management practices (BMPs) designed to reduce sediment carried in overland flow. Sediment levels declined, and in 2008 WDEQ removed Sage Creek from the Wyoming CWA section 303(d) list of impaired waters.

Problem

Sage Creek is in the North Platte River Basin of southeastern Wyoming. The creek's headwaters are along the continental divide in the northern foothills of the Sierra Madre at an elevation of approximately 8,400 feet. The 263-square-mile Sage Creek watershed drains into the North Platte River near the town of Saratoga (Figure 1). WDEQ classifies Sage Creek as waterbody type 2AB; thus, it is protected for the designated uses of drinking water, coldwater game and nongame fisheries, fish consumption, aquatic life, recreation, wildlife, industry, agriculture and scenic value. The Sage Creek watershed produces naturally high sediment loads because of its highly erodible soils. Dam failures, road construction and historic livestock grazing practices have exacerbated the erosion, especially during precipitation events and the spring snowmelt runoff period (Figure 2).

SERCD collected data in 1996 indicating that excessive sediment degraded habitat and threatened the coldwater fishery and aquatic life designated uses along a 14-mile section of lower Sage Creek. The sediment traveled downstream, accumulating in reservoirs and requiring increased processing time and expense to municipal water treatment facilities. WDEQ considered the sediment load to also be a potential threat to the health of the North Platte River's coldwater game fishery. Therefore, WDEQ added Sage Creek to the state's 1996 CWA section 303(d) list for impairment to its coldwater fish and aquatic life (other than fish) designated uses.

Figure 1. Photo of lower Sage Creek near the confluence with the North Platte River.

Figure 2. Photo showing a high sediment load in Sage Creek after a storm event.

Project Highlights

In 1997 SERCD led a Sage Creek Watershed CWA section 319 project that brought together local landowners, the U.S. Bureau of Land Management, the U.S. Department of Agriculture's Natural Resources Conservation Service and the Wyoming Game and Fish Department. The partners implemented a series of BMPs and monitored the effect of those management changes by collecting sediment and macroinvertebrate samples. BMPs, which focused on restoring riparian habitat and reducing sediment inputs to the stream carried by overland flow, included using short-duration grazing, adding riparian and drift fencing, developing off-channel water sources, improving road management, adding grade-control structures, and using water diversions and vegetation as a sediment filters. The partners anticipated that the project would improve water quality in Sage Creek and reduce sediment loading from the creek to the North Platte River.

Results

Data collected as part of the CWA section 319 project show that the BMPs effectively mitigated the threats to the coldwater fishery and aquatic life (other than fish) uses. Specifically, riparian vegetation such as willows reestablished quickly, stabilizing stream banks and converting the stream channel from a wide and shallow configuration to one that is narrower and deeper. Such in-stream and riparian morphological changes translated into cooler water temperatures and increased stream power that better mobilizes fine sediment deposits on the streambed.

Measurements of suspended sediment in Sage Creek show a trend of decreasing concentration after implementing BMPs. Mean total suspended solids went from 529 milligrams per liter (mg/L) in 1998 to 80 mg/L in 2004. In addition, scientists collected post-project macroinvertebrate samples on the North Platte River above and below its confluence with Sage Creek using the Wyoming Stream Integrity Index and River Invertebrate Prediction and Classification System. Those data indicate that both locations are fully supporting their aquatic life (other than fish) designated use, and that the sampling location below the confluence has a trend of a slightly higher biological condition. That data prompted WDEQ to remove Sage Creek from the CWA section 303(d) list in 2008.

Partners and Funding

The project received a total of $126,149 through CWA section 319 performance partnership grants along with $88,148 of in-kind matching funds. That funding supported implementing BMPs and conducting effectiveness monitoring of the management changes. SERCD led the Sage Creek watershed CWA section 319 project, which was a cooperative effort among local landowners, the Bureau of Land Management, the Natural Resource Conservation Service and the Wyoming Game and Fish Department.

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