NONPOINT SOURCE SUCCESS STORY

Wyoming

Best Management Practices Improve Water Quality and Benefit Ranchers in North-Central Wyoming Watershed

Waterbody Improved

Historic grazing practices resulted in degraded rangeland conditions, stream channel instability, and poor stream biological condition within the Grass Creek/Cottonwood Creek watershed in north-central Wyoming. The Nature Conservancy (TNC) worked with ranchers and numerous other partners to implement best management practices (BMPs) throughout the watershed to improve ranching operations and promote rangeland, riparian and stream health. Data collected by TNC and partners indicate that rangeland, riparian and stream biological conditions have continued to improve since project implementation.

Problem

A 2007 Wyoming Water Development Level I Watershed Management Study of the Grass Creek/Cottonwood Creek watershed in the Big Horn Basin of Wyoming concluded that intensive cattle and sheep grazing in the late 1800s degraded rangeland conditions (Figure 1). Although improved range management over time led to some areas recovering from these historic impacts, others remained degraded. In particular, riparian zones and stream channels remained degraded as a result of historical and current disturbances from wildlife and livestock that concentrate in these areas for water, food and cover. In addition, a history of fire suppression caused conifer encroachment into aspen stands and riparian areas, and noxious weed infestations degraded range and riparian areas. Findings from water quality monitoring completed by Wyoming Department of Environmental Quality (WDEQ) in the late 1990s and mid-2000s indicated streams were experiencing incision, bank erosion, sedimentation, degraded riparian vegetation and poor biological conditions.

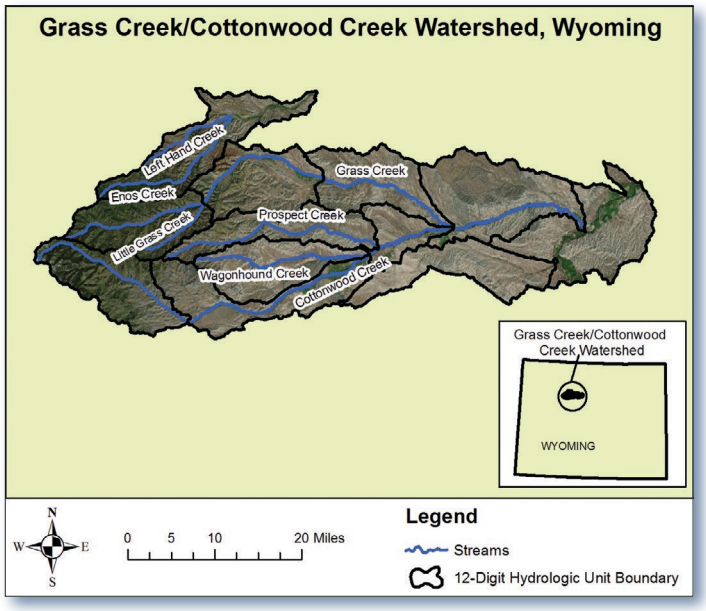

Figure 1. Map of the Grass Creek/Cottonwood Creek watershed and major project area streams.

Story Highlights

A Coordinated Resource Management group of proactive stakeholders was formed in 2004 to address resource concerns. Interest in developing range monitoring programs prompted TNC to work with ranches and other partners to coordinate broader watershed restoration efforts that would improve range conditions, wildlife habitat and water quality. As part of this effort, TNC received Clean Water Act (CWA) section 319 funding to implement BMPs to achieve water quality restoration goals. TNC and partners implemented the CWA section 319 project over three phases and accomplished an impressive amount of work between 2008 and 2016. Partners completed a total of 30 off-channel water development projects, including installation of 47 water tanks, to improve livestock and wildlife distribution on more than 14,000 acres of rangeland while also reducing pressure on riparian areas. Over 80 acres were protected through

14 riparian, spring development and aspen stand exclosures. Conifer encroachment and noxious weed treatment, aspen stand regeneration, and willow and cottonwood plantings occurred on over 600 acres. In addition, over 20 miles of wildlife-unfriendly fencing was taken down over the course of the project.

Results

Installing BMPs resulted in estimated reductions of 217 tons/year of sediment, 2,000 pounds (lbs)/year of nitrogen and 270 lbs/year of phosphorus from overland runoff in the watershed. Moreover, an estimated reduction of 1,479 tons/year of sediment from excessive stream bank erosion throughout much of Grass, Lefthand and Little Grass creeks had also been accomplished as a result of BMPs. Range monitoring indicated improving trends in desirable plant species with accompanying decreases in shrubs and bare ground areas as a result of implemented BMPs. Water quality monitoring revealed a coarsening of stream substrate over time as well as an overall improving trend in biological condition with respect to diversity and abundance of sensitive aquatic macroinvertebrates (Figure 2). The project also resulted in benefits to livestock operations, including improved management efficiency, better utilization of upland forage, secure water sources, and wildlife-friendly fences requiring less maintenance.

Partners and Funding

This project has been exemplary in its proactive approach to addressing watershed degradation through implementation of diverse BMPs, its focus on finding solutions that benefited livestock operations in addition to natural resources, its documentation of benefits through monitoring, and its successful coordination of numerous partners. Partners included LU Ranch, Hillberry Ranches, Hot Springs Weed & Pest, Marathon Oil, Round River Conservation Studies, Wyoming Conservation Corps, volunteers from the general public, WDEQ, Wyoming Game and Fish Department, Wyoming Department of Agriculture, Wyoming Wildlife and Natural Resource Trust, University of Wyoming Extension, Wyoming Honor Farm, Natural Resources Conservation Service, Wyoming State Forestry, and Bureau of Land Management. TNC's leadership in this project was critical to its success. A total of $433,482 in CWA section 319 funds and $289,640 in state/private funds were expended on this project.

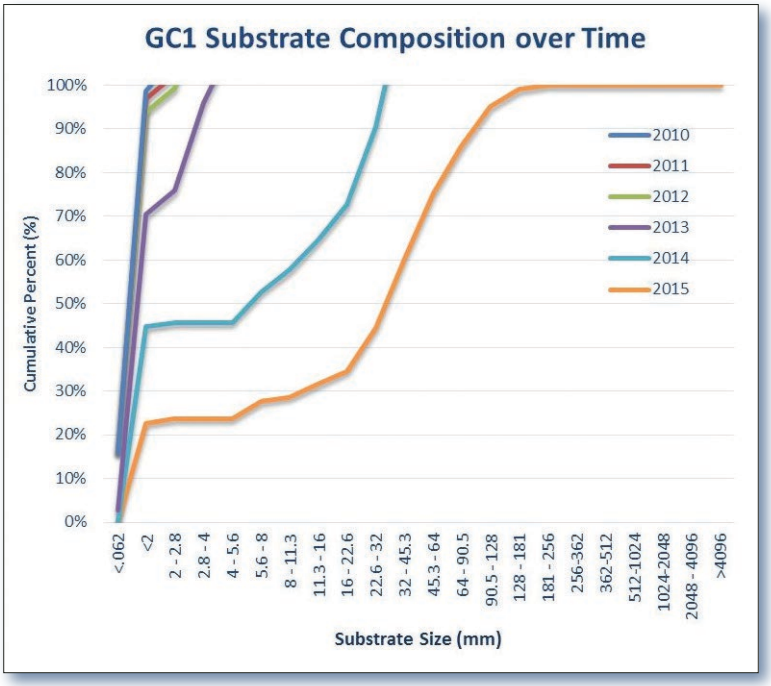

Figure 2. The substrate composition in the Grass Creek/Cottonwood Creek watershed has grown coarser over time.

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

EPA 841-F-18-001BB
October 2018

For additional information contact:

Jennifer Zygmunt
Wyoming Department of Environmental Quality
307-777-6080 • jennifer.zygmunt@wyo.gov