

EROSION AND SEDIMENTATION CONTROL (AGRICULTURE): BADGER CREEK NONPOINT SOURCE WATER QUALITY PROJECT

Conducted by: Sangre de Cristo Resource & Development Council, Inc.

On the Web: www.epa.gov/nps/Section319II/CO.html

Contact: Sangre de Cristo RC&D

Project Partners: U.S. Department of Agriculture – Natural Resources Conservation Service, Forest Service, Farm Service Agency; U.S. Department of the Interior – Bureau of Land Management and Bureau of Reclamation; State of Colorado – Division of Wildlife, Land Board and Forest Service; Conservation Districts; Park and Fremont County Commissioners; Southeastern Colorado Water Conservancy District; Upper Arkansas Council of Governments; Colorado Trout Unlimited

Contract Period: 1990 to 1996

NPS Funding: \$162,500

Matching Funds: \$456,000

A tributary of the Arkansas River, Badger Creek drains approximately 135,040 acres in Park and Fremont counties. It has a history of both carrying sediment-laden floodwaters into the Arkansas River and providing an important spawning ground for Brown Trout.

The goals of the Water Quality Project were to reduce flooding and sediment discharge from the watershed as well as to improve the fishery habitat.

Intended fishery improvements included reducing flooding, channel stabilization, improving riparian plant communities, and improving integrated resource management.

Badger Creek flows for about 25 miles through a mixture of federal, state and private land before joining the Arkansas River near Salida. The private property ranges from large ranch holdings to smaller rural residential properties.

The northern part of the watershed is largely open, rolling rangeland. The southern portion has steep, rocky slopes covered with Piñon and Juniper trees. The upper portion flows intermittently, but about midway Badger Creek is fed by a large spring providing for a good cold-water fishery.

In the 1950s and 1960s, erosion control structures were installed in parts of the watershed, but poor hydrologic conditions persisted. Following a major flood in 1978, a number of government agencies developed a cooperative management plan to solve the watershed's problems. In 1987, the Sangre de

Cristo Resource Conservation and Development Council began coordinating the Badger Creek cooperative effort to integrate the management of both public and private land.

It was decided that the most effective approach to improve the watershed would be to concentrate on the upper reaches where more than half of the sediment loading was occurring.

The United States Forest Service and the Bureau of Land Management improved road maintenance, built erosion control structures

and improved grazing practices on land they managed. The Sangre de Cristo RC&D submitted a request for NPS funding to be used to cost share fencing, livestock water development and erosion control structures on private and state land.



Badger Creek

Over a five-year period, Best Management Practices (BMPs) were applied to more than 23,700 acres of state and private rangeland that had been determined to be in poor condition. These BMPs included rotational grazing systems, development of livestock water facilities and fencing for better livestock grazing distribution, construction of erosion control structures, and establishment of a grazing demonstration site.

During the course of the project, numerous articles were published, presentations made and public meetings held to inform stakeholders and the public at large of progress. A core management team met at least annually to monitor data, review progress and assess strategies. In addition, the Sangre de Cristo RC&D Council sponsored a series of

Holistic Resource Management seminars and field trips.

Critical to the success of the project was the monitoring plan. Ten water quality, fish population and biomass collection stations were located in the watershed to determine baseline and ongoing data.

The objectives of monitoring were to evaluate the effectiveness of the BMPs, assess impacts of management strategies on riparian areas and determine biological impacts to macro-invertebrates, silt tolerant taxa and Brown Trout in Badger Creek.

Monitoring results showed a general upward trend in characteristics of vegetation, soil, stream channels and other tangible aspects in the areas where changes in management were made. Sediment transport (per unit water) appeared to be declining. Sediment was either staying in place because of erosion control measures or being filtered by the improved riparian conditions.

In areas where no changes were made, long-term trend data indicated static or declining conditions.

Animal population data showed mixed results. Elk populations were on the increase, but the fishery was slower to respond. Fish populations may take more time to respond to improved habitat, as they also are impacted by increasing human activity in the watershed.

Ongoing monitoring, evaluation and education are priorities for the Badger Creek team as is the effort to involve a broader coalition of stakeholders. The improved water and environmental quality is part of the greater mission of overall watershed management.



“Including as many people as possible in the planning process was the most important aspect of our management in the Badger Creek Watershed. Initiating Holistic Resource Management training for agency representatives and interested landowners helped to focus on our goals and to work toward common objectives.”

*– John Carochi, District Manager,
Bureau of Land Management*