Restoring Riparian Areas Improves Trout Fishery - The Squaw and Baldwin Creeks Watershed

The Squaw and Baldwin creeks' section 319 project lies in west-central Wyoming, near Lander in Fremont County. The watershed consists of approximately 51.7 square miles, including a 13-mile stretch of Squaw Creek (a tributary of Baldwin Creek) and a 17-mile section of Baldwin Creek. Each section extends from the point where Baldwin Creek leaves federal property (managed by the Bureau of Land Management or the U.S. Forest Service) to its confluence with the Middle Fork of the Popo Agie River, north of Lander. Land ownership is primarily private, interspersed with state-leased properties. The properties include ranches ranging in size from 500 to 2,500 acres with the larger percentage of properties consisting of small ranchettes and subdivisions in the populated fringes of Lander city. A portion of Squaw Creek traverses the Lander city limits, including high school and elementary school properties.

Squaw and Baldwin creek valleys were settled, along with the town, in the 1800s. At the time, these streams supported riparian vegetation, healthy fish, and abundant wildlife habitats. Residents report seeing many beaver dams and enjoying excellent brown trout fishing as recently as 50 years ago. Sometime during these early years, water was diverted from the streams and used to irrigate hayland adjacent to the stream channels.

Riparian areas decline

The streambanks and overflow channels gradually lost the natural diversified riparian vegetation they once had through excessive grazing by livestock and burning and clearing for agriculture, along with the urban sprawl of subdivisions. Gone were the beaver dams, and with them, most of the trout. Channel alterations, such as cutting through meanders, facilitated further deterioration of the channel area over time. Improper irrigation wastewater return and poor irrigation water management in the channel vicinity further eroded the two streams.

Seasonal high water, resulting from melting valley snowpack and snow on the northern slopes of the Wind River Mountains, flushes the channels with high volumes and velocities of water. Tremendous amounts of sediment are washed from raw banks and channels into these streams, then into the Popo Agie River system, which in turn, dumps sediment into the Wind River and eventually into Boysen Reservoir.

The North and Middle Forks of the Popo Agie River are both important trout streams and run clear even through much of the high water season. Squaw and Baldwin creeks, though they contribute little water to the river system, totally cloud the water with tremendous sediment loads. The Squaw/Baldwin creeks watershed has been identified as the single greatest contributor of silt and associated contaminants to the Popo Agie River. Their sediments damage Popo Agie trout fishery by covering important food sources and smothering fish eggs. In October of 1990, the Popo Agie Conservation District received the first of two grants from the Wyoming Department of Environmental Quality, Water Quality Division (DEQ) and EPA under Section 319 to reduce nonpoint source pollution in Squaw and Baldwin creeks.

The Squaw and Baldwin Creeks

Correcting grazing and irrigation practices

The Popo Agie Conservation District leads the project in partnership with the USDA Natural Resources Conservation Service (NRCS), landowners, City of Lander, Wyoming Game and Fish Department, Bureau of Land Management, USDA Forest Service, and Fremont County Weed and Pest District. Lander Valley High School, Northside Elementary School, Teton Science School, U.S. Fish & Wildlife Service, and Boy Scouts of America are also involved in information and education portions of the project.

The project goal is to reduce nonpoint source pollution in Squaw and Baldwin creeks while correcting resource-related problems in the riparian areas. Conservation practices have been installed and land users are implementing total resource management systems. The project installed best management practices (BMPs) to prevent streambank and channel erosion and to improve grazing and irrigation management adjacent to riparian zones. In addition, the project provides an invaluable educational vehicle to teach students and the public about nonpoint source pollution and gives hands-on experience in working with these practices.

To date, approximately 18 miles of streambank have been treated with BMPs such as riparian fencing, plantings, water gaps, streambank stabilization, irrigation water control structures and pipelines, grade stabilization structures, pasture and hayland management, planned grazing systems, and irrigation water management. These practices address problems such as overgrazing, grazing in riparian areas, and irrigation water application and runoff.

As many as 25 landowners participated under the initial grant, including the Education/Demonstration site behind Lander Valley High School; and 16 landowners have contracted with the District in the second grant. Of these, 12 contracts have been completed with four in progress. The Popo Agie Conservation District offers participants a 60 percent cost-share assistance grant from DEQ and/EPA; 25 percent from District funds, and 15 percent from landowner contributions.

Signs of success

Monitoring by the District, Lander Valley High School Students, Wyoming Game and Fish Department, and others have demonstrated numerable accomplishments. Examples include an increase in pollution-intolerant macroinvertebrates with a corresponding decrease in pollution-tolerant macroinvertebrates. The Wyoming Game and Fish Department reports a dramatic improvement in the brown trout population.

The observation that Squaw Creek no longer runs red is evidenced by water sampling reports. Total suspended solids have decreased an average of 38 percent during the years 1993 into 1996. Community awareness has generated interest in additional partnerships and has facilitated the locally led conservation effort.