Nutrioso Creek: A Nonpoint Source Success Story

Waterbody Improved

Arizona placed a segment of Nutrioso Creek on the state's Clean Water Act (CWA) Section 303(d) list of impaired waters in 1998 because of high turbidity. The impairment negatively impacted several native fish, including one federally listed species. Arizona identified streambank erosion as the cause for the turbidity. Shortly before the creek was listed as impaired, private landowner Jim Crosswhite purchased property—the EC Bar Ranch—on Nutrioso Creek. He quickly began to address water quality and habitat concerns. Crosswhite implemented best management practices (BMPs) that controlled activities of grazing animals such as livestock and elk, restored the stream channel, and reduced turbidity. In 2007, because the impaired segment of Nutrioso Creek once again met water quality standards, Arizona recommended that it be removed from the list of impaired waters.

Problem

Eastern Arizona's Nutrioso Creek, a 27-mile perennial stream in the White Mountains of Apache County, is a tributary to the Little Colorado River. Several native fish live in these waters, including the federally endangered Little Colorado spinedace (*Lepidomeda vittata*). In 1998 Arizona placed a 7-mile segment of Nutrioso Creek on the list of impaired waters because it exceeded the 10 Nephelometric Turbidity Units (NTU) standard for coldwater stream aquatic and wildlife habitat. The state identified impairments on 4 miles of creek in the Apache-Sitgreaves National Forest and along 3 miles of creek on the privately owned EC Bar Ranch. The state identified historic grazing practices as the primary cause of high turbidity levels. As grazing animals had trampled and consumed Nutrioso Creek's riparian vegetation, streambank stability decreased and streambank erosion increased over time.

Newly restored Nutrioso Creek now has a higher water table, less erosion, and more wildlife species.

Project Highlights

In 1996 Jim Crosswhite purchased the EC Bar Ranch and began to address water quality and aquatic/wildlife habitat concerns in the creek. Crosswhite followed a three-step approach to improving the riparian area. First, he implemented BMPs: (1) he fenced out elk entirely and limited livestock grazing to the dormant winter months; (2) he planted willow poles and installed practices such as weirs to reduce streambank erosion; and (3) he established native narrow-leaf cottonwoods and Western Wheatgrass. Crosswhite's second step was to adopt livestock (cattle), nutrient, irrigation water, and pest management plans recommended by the Natural Resources Conservation Service (NRCS). As his final step,

Crosswhite used fences to eliminate or control wildlife and livestock activities in the riparian areas.

he is considering long-term planning options that can protect the restored area, such as a conservation easement, deed restrictions, and/or sale of riparian areas to the U.S. Forest Service (USFS). To date no final protective action has been completed, although some agreements have been drafted, initial surveys and appraisals completed and aerial photos taken.

Crosswhite has provided public outreach through written publicity, personal presentations, and field trips. Crosswhite maintains a project Web site (www.ecbarranch.com) where information about BMPs, agency reports, and monitoring is available. Crosswhite's extensive outreach initiatives help to educate other landowners on many of the BMPs that they can implement in the Nutrioso Creek area and beyond.

Results

Crosswhite worked closely with the Arizona Department of Environmental Quality (ADEQ) to implement BMPs that controlled activities of large grazing animals, restored the proper functioning condition in the stream channel, and reduced turbidity levels. The condition of soils, vegetation, and hydrology was improved from non-functional in 1996 to proper functioning condition in 2005 using the Bureau of Land Management rating system. In addition, monitoring results showed that turbidity levels plummeted from more than 50 NTU in 2000 to less than 10 NTU by 2004. Nutrioso Creek once again meets water quality standards. Therefore, in 2007, the ADEQ recommended removal of Nutrioso Creek from the 303(d) list, making it the first impaired waterbody in Arizona to be delisted as a result of mitigation.

Additionally, the U.S. Fish and Wildlife Service (USFWS) was so impressed with the aquatic habitat recovery on the EC Bar Ranch's portion of Nutrioso Creek that it captured and moved 767 Little Colorado spinedace from degraded pools downstream on National Forest land to the restored habitat on the EC Bar Ranch. In a letter to Crosswhite, the USFWS emphasized that, "the practice of salvaging a listed species from public land and repatriating the species to private land is rarely warranted and demonstrates [Crosswhite's] commitment to threatened and endangered species."

Partners and Funding

Crosswhite partnered with state and federal agencies, such as the ADEQ, Arizona Game and Fish Department (AGFD), Arizona State Land Department, Arizona Department of Agriculture, Arizona Water Protection Fund, NRCS, and USFWS. He worked with many organizations to address a broad spectrum of environmental concerns, including those outlined in Nutrioso Creek TMDL for Turbidity Report (ADEQ 2000), Little Colorado River Spinedace Recovery Plan (USFWS 1998), Nutrioso Creek Fish Management Report (AGFD 2001), and the Upper Little Colorado River Watershed Based Plan (2000-2006). He was the first private landowner in Arizona to complete a Safe Harbor Agreement with the USFWS (2003)—this agreement promotes voluntary management for listed species on nonfederal property while assuring participating landowners that no additional regulatory restrictions will be imposed.

Crosswhite's Nutrioso Creek restoration project cost exceeded $2 million, a portion of which was funded by $575,000 from CWA Section 319 grants, $100,000 from NRCS, and $163,000 from wildlife agencies and others. Crosswhite matched more than 60 percent of public funding with his own resources.

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