

NONPOINT SOURCE SUCCESS STORY



East Canyon Creek Projects Improve Water Quality

Waterbodies Improved

Elevated phosphorus levels in East Canyon Creek in the 1990s led to its listing as an impaired water under Section 303(d)

of the Clean Water Act. In 2000, the Utah Division of Water Quality (DWQ) began working with federal, state, and local partners to implement projects to address excess phosphorus and other water quality impairments in East Canyon Creek. These projects reduced phosphorus and sediment loading into the creek and improved riparian habitat. Improved stream habitat and decreased sediment loading led to the 2020 delisting of East Canyon Creek for macroinvertebrates. These projects coupled with new monitoring data also led to the 2020 delisting of East Canyon Reservoir for maximum temperature and minimum dissolved oxygen impairments.

Problem

The East Canyon Creek watershed is about 20 miles east of Salt Lake City, Utah, and drains 144 square miles of diverse terrain on the eastern slope of the Wasatch Mountains (Figure 1). The creek is a tributary to the Weber River. The river provides municipal, industrial, agricultural and recreational water to several hundred-thousand residents. Most of the watershed is privately owned, and growth rates have increased exponentially since 2002.

Designated beneficial uses in this watershed include domestic water use, primary and secondary contact recreation, cold-water game fish and agricultural water supply. East Canyon Creek is the principal drainage in the watershed and feeds into East Canyon Reservoir.

In 1992, an assessment conducted on East Canyon Creek showed elevated levels of phosphorus that were adversely impacting the cold-water game fishery in East Canyon Reservoir. Subsequent monitoring of macroinvertebrates in 2008 indicated that East Canyon Creek was also biologically impaired.

Assessments in 2014 found excess levels of total dissolved solids (TDS) and elevated temperatures in the creek. These impairments were likely the result of increased development, urban runoff, overgrazing and high rates of erosion in the watershed. A Stream Visual Assessment Protocol (SVAP) conducted in 2002, for example, showed that over 50% of the stream length had poor channel or riparian conditions.



Figure 1. East Canyon Creek is in northern Utah.

Story Highlights

DWQ began actively working with the East Canyon Creek Watershed Committee in 2000 to address water quality impairments. The division developed a total maximum daily load (TMDL) in 2010 for East Canyon Creek and East Canyon Reservoir that included detailed implementation plans for both waterbodies. The TMDL identified low dissolved oxygen as a pollutant of concern. Low dissolved oxygen levels likely resulted from a lack of shade and riparian vegetation along the stream, channel widening, low flow during the summer months, sediment loading and algal blooms. Partners addressed these issues through a variety of point and nonpoint source projects and approaches:

- Best management practices (BMPs) were used to stabilize and revegetate 2.23 miles of East Canyon Creek and included the installation of 12,000 willow stakes, 3,000 container plants, and 20 beaver dam analogs in the riparian area (Figure 2). Installation of 17,941 linear feet of riparian fencing has also helped improve grazing management.
- The Snyderville Basin Wastewater Reclamation District (SBWRD) upgraded its wastewater treatment plant in 2004. This upgrade significantly reduced phosphorus loading into the creek.
- A flow study conducted in 2005 recommended a minimum flow of 6 cubic feet per second (cfs) in the creek, with an allowance for 3.5 cfs under extreme drought conditions. These baseline flows have been met and exceeded over the past decade and helped improve and maintain stream health.

Results

Since restoration efforts began, phosphorus and sediment loads in East Canyon Creek have decreased noticeably and macroinvertebrates scores have increased (Figure 3). These efforts also led to improved water quality in East Canyon Reservoir. Since 2001, CWA section 319-funded project work by the East Canyon Creek Committee has reduced sediment loads by an estimated 2,698 tons/year and phosphorus loads by 3,778 pounds/year. Additional ongoing riparian corridor projects in the watershed are funded in part by Utah's nonpoint source funds with matches from multiple sources. Improved stream habitat and decreased sediment loading led to the 2020 delisting of East Canyon Creek for macroinvertebrates. New monitoring data reflecting the various practices in the watershed led to the 2020 delisting of East Canyon Reservoir for maximum temperature and minimum dissolved oxygen impairments.



Figure 2. East Canyon Creek before and after restoration.



Figure 3. Average observed/expected (OE) macroinvertebrate scores (2000–2016).

Partners and Funding

Agencies and producers spent a combined total of more than \$2.29 million on nonpoint source water quality improvement projects in the East Canyon Creek watershed. Funding sources included \$832,091 in CWA section 319 funds; \$310,000 in state nonpoint source funds; \$279,744 in Natural Resource Conservation Service funds; \$500,000 from the American Recovery and Reinvestment Act; \$43,000 from Trout Unlimited; and \$327,108 in local partner and producer contributions.



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