



NONPOINT SOURCE SUCCESS STORY

Utah

Main Creek Watershed Meets Temperature Standards as a Result of Riparian Improvements

Waterbody Improved Since 2012 the Utah Division of Water Quality and various agency partners and private landowners have restored more than 7.5 miles of riparian habitat along Main Creek, which was listed on the Clean Water Act (CWA) section 303(d) list of impaired waters for *Escherichia coli* and temperature in 2010. These restoration efforts have not only improved habitat for wildlife and aquatic life, but have also reduced phosphorus and *E. coli* concentrations. Most notably, this restoration work has helped significantly reduce water temperature. As a result of this reduction in temperature, Main Creek was removed from the 303(d) list of impaired waterbodies for temperature in 2014. However, it remains listed as impaired for *E. coli*.

Problem

Main Creek, located within the Wallsburg Watershed, is one of several tributaries to Deer Creek Reservoir in northern Utah (Figure 1). This reservoir is an important drinking water source to Salt Lake City and the Wasatch Front. Deer Creek Reservoir has experienced low levels of dissolved oxygen due to elevated water temperatures and excess algae growth fueled by nutrient loading. Main Creek also has high levels of phosphorus and *E. coli* as well as elevated water temperature. Main Creek (segment UT16020203-009_00) was placed on the CWA section 303(d) list of impaired waters for *E. coli* and temperature in 2010. A management plan was developed for the Wallsburg Watershed in 2007 that identified overgrazing as one of the main sources of pollution in the watershed.



Figure 1. The Main Creek watershed is in north-central Utah.

Story Highlights

In March 2007, the Wasatch Conservation District met with local stakeholders to address resource concerns in the Wallsburg Watershed. Using the Coordinated Resource Management (CRM) process, stakeholders, landowners, and agency personnel evaluated local resources and the potential for actions to protect and restore the watershed. Participants listed water conservation and water quality as the top two resource concerns. Streambank restoration was identified in the Wallsburg CRMP as an effective way to lower water temperature and reduce *E. coli* and total phosphorus (TP) loading to Main Creek and Deer Creek Reservoir. Streambanks are characterized as highly erodible due to lack of riparian vegetation and access by livestock. The lack of native woody vegetation along the creek also allowed for higher in-stream temperature due to a lack of shading.

Restoration projects began on Main Creek in September 2012. Currently more than 7.5 miles of stream have been treated with a range of practices including streambank protection (39,600 feet), riparian buffer restoration (24.4 acres), livestock stream crossings (1,920 square feet) and two alternative watering facilities. Nearly 50,000 feet of fence has been installed to better control grazing within the watershed (Figure 2).



Figure 2. Before (2013) and after (2017) streambank restoration was completed along Main Creek.

Results

As a result of the project implementation, notable improvements have been observed within the Main Creek watershed. These improvements include significant loading reductions of *E. coli* and nutrients (Figure 3). The amount of fine sediment in the creek has decreased and the vegetative cover has increased. The channel width has narrowed and pool depth has increased, leading to decreased water temperatures and a vast improvement in the biological composition in the restored sections. Data show that Main Creek met water quality standards for temperature beginning in 2014 (Table 1); prompting it to be removed from the CWA section 303(d) list of impaired waterbodies in. While *E. coli* loading into Main Creek has been reduced by 54% since project implementation has begun, Main Creek does not yet consistently meet standards; therefore, Main Creek remains listed as impaired for *E. coli*.

Table 1. Main Creek temperature exceedances over time.

Impaired	IR Year	COUNT	# EXCEED	% EXCEED
Yes	2010	44	8	18%
Yes	2012	46	7	15%
No	2014	47	2	4%
No	2016	48	2	4%
No	2018	38	3	8%

**If samples exceed standards 10% of the time the waterbody is considered impaired*

Partners and Funding

Agencies spent more than \$2.5 million to implement projects throughout the watershed, including \$293,019 in CWA section 319 funding and another \$395,710 in state nonpoint source grants. Other significant funding was provided by the Natural Resource Conservation Service (\$1.05 million), Utah Department of Agriculture and food (\$350,939), Utah Department of Natural Resources (\$277,443), Provo River Watershed Council (\$60,000), U.S. Fish and Wildlife Service (\$21,469), and landowner in-kind match (\$186,452).



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