



NONPOINT SOURCE SUCCESS STORY

Idaho

Riparian and Wetland Restoration Reduces Bacteria in Deep Creek

Waterbodies Improved

Agricultural sources contributed to impairment of Deep Creek in the Idaho portion of the upper Palouse River Subbasin. First identified as impaired in 1992, the Idaho Department of Environmental Quality (DEQ) included four Deep Creek assessment units (AUs) on the 1998 Clean Water Act (CWA) section 303(d) list of impaired waters due to bacteria, sediment and temperature. Watershed partners implemented agricultural best management practices (BMPs) and stream and wetland restoration projects, which reduced bacteria levels and prompted DEQ to propose to remove two Deep Creek AUs from the impaired waters list in 2016 for bacteria.

Problem

Deep Creek is in the Palouse River Subbasin in Latah County in northwest Idaho. Agriculture, grazing, forestry, residential areas and recreation are the major land uses within this sparsely populated region. Most of the land within the 42.75-square-mile Deep Creek watershed is privately owned.

DEQ added Deep Creek to the 1992 CWA section 303(d) list of impaired waters based on best professional judgement of limited data submitted by the Columbia River Intertribal Fish Commission. The 1998 CWA section 303(d) list included four Deep Creek AUs: ID17060108CL032a_02, ID17060108CL032a_03, ID17060108CL032b_02 and ID17060108CL032b_03 (Figure 1). All AUs were listed as impaired for bacteria, sediment and temperature.

Additional data were collected in 2001–2002 that confirmed the impaired status of this watershed for bacteria as well as sediment and temperature. Samples from three monitoring sites in the Deep Creek watershed showed exceedances of the state's secondary contact instantaneous water quality standard for bacteria, which requires that *Escherichia coli* bacteria concentrations in a single sample not exceed 576 *E. coli* organisms/100 milliliters (mL). Eight of 18 samples collected across the three sites exceeded the *E. coli* standard, with three samples showing levels exceeding 1,000 organisms/mL. In 2005 DEQ performed detailed analyses on Deep Creek and developed total maximum daily loads (TMDLs) for bacteria, sediment and temperature.

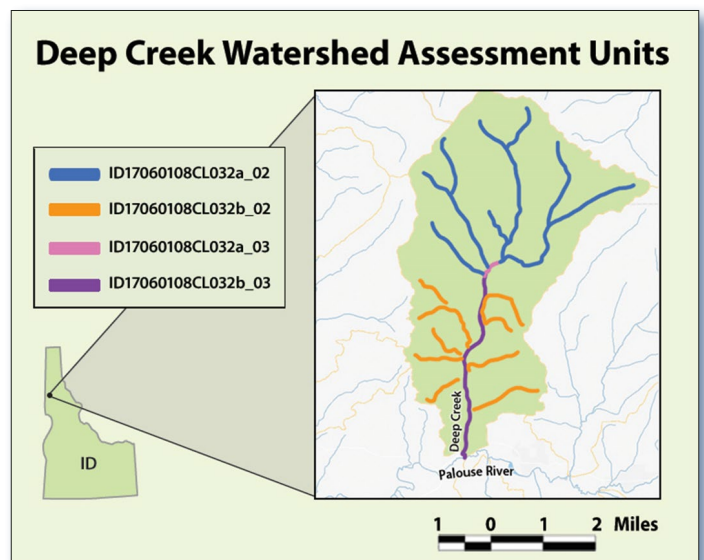


Figure 1. Deep Creek is in Idaho's upper Palouse River Subbasin.

Story Highlights

Beginning in 2006 the Palouse-Clearwater Environmental Institute (PCEI), a community-based nonprofit organization, led CWA section 319 grant-funded efforts to decrease nonpoint source pollutant loads into Deep Creek. In 2006 PCEI undertook the Deep Creek Stabilization Project, which included stabilizing streambanks (2,782 feet), restoring riparian buffer areas that filter agricultural runoff, and installing livestock-related BMPs (Figure 2). The project included off-stream watering for livestock as well as a riparian fence and hardened rock crossing to allow controlled access to both sides of the creek.

Photos: PCEI



Figure 2. Photos of Deep Creek in 2005 (top) and 2008 (bottom) show the restoration of the stream channel and riparian area.

In 2008 PCEI collaborated with the Latah Soil and Water Conservation District (SWCD) to complete the Deep Creek Riparian Restoration Project, part of a larger Palouse River watershed project developed by the Palouse Tributaries Watershed Advisory Group. The project included stabilizing and revegetating streambanks (1,070 feet). With help from 25 student volunteers from Washington State University, a 22,500-square-foot variable riparian buffer was planted with native woody, herbaceous and grass species to help filter runoff before it reaches the creek. PCEI also enhanced an existing wetland and created two new wetland areas to help filter bacteria and nutrients in runoff from a landowner’s horse pasture.

Results

Implementation efforts have improved water quality in the Deep Creek watershed, as shown by DEQ’s 5-year review of the Palouse River Subbasin TMDL in 2016. Data collected during the review showed that bacteria levels in both the uppermost and lowermost Deep Creek AUs now meet the state’s water quality standard for bacteria, which requires that waters must not contain more than a geometric mean of 126 *E. coli* organisms/100 mL (based on a minimum of five samples taken every 3 to 7 days over a 30-day period)

Table 1. Deep Creek 2013–2014 data show that the lowermost and uppermost AUs in the Deep Creek watershed meet water quality standards for bacteria.

Deep Creek Assessment Unit	Sample Dates	# of samples	<i>E. coli</i> range ¹	Geometric Mean
ID17060108CL032b_03	6/4/2014–6/24/2014	5	16–105.5	48
ID17060108CL032a_02	9/4/2013–9/30/2013	5	5.2–135.4	31

¹ Number of *E. coli* organisms/100 mL of water

or a single sample of 576 *E. coli* organisms/100 mL (Table 1). Based on these data and implementation efforts, DEQ proposes to remove the bacteria impairment from two Deep Creek AUs in 2016: 032b_03 and 032a_02. Until additional AU-specific data can be collected, AU 032b_02 will remain listed as impaired for bacteria. DEQ is proposing to move AU 32a_03 to the “unassessed” category because it is unlikely that data have been collected due to challenges in obtaining permission to access private property.

Partners and Funding

The Deep Creek Stabilization Project was supported by \$190,547 in 2006 CWA section 319 grant funds. The Deep Creek Riparian Restoration Project was part of a larger water quality improvement project (the Palouse River Water Quality Improvement Project) that was supported by 2006 CWA section 319 grant funds (\$215,491) and local matching funds (\$146,231 total). Local matching funds for the Palouse River project were provided by PCEI (community volunteers and materials: \$35,460), Idaho Soil Conservation Commission (technical staff: \$16,825; BMP cost-share: \$21,450), landowners (BMPs: \$30,000), Idaho Association of Soil Conservation Districts/Latah SWCD (field surveys: \$6,000), University of Idaho (technical staff and materials [TSM]: \$8,574), Idaho Department of Lands (TSM: \$10,968), Potlatch Corporation (TSM: \$11,400), and the North Latah County Highway District (TSM: \$5,554).

This project succeeded because of the cooperation between private landowners (including Buck Espy and John Adler), Natural Resources Conservation Service, PCEI, local and state organizations, university professors and students, students from local schools, and many volunteers. DEQ’s Lewiston Regional Office staff conducted water quality monitoring.



U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-18-001H
March 2018

For additional information contact:

Sujata Connell
Water Quality Analyst, Idaho Department of
Environmental Quality
208-799-4370 • Sujata.Connell@deq.idaho.gov