Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Wyoming

BMPs Reduce Sediment and Restore Streams

Waterbody Improved

Surface runoff from irrigated agriculture areas and poorly designed water conveyance features caused erosion and threatened the aquatic life uses of North Fork Shell Creek and South Fork Shell Creek in northeastern Wyoming. The sediment issues prompted the Wyoming Department of Environmental Quality (WDEQ) to place both streams (16.69 miles total) on the state's 2000 Clean Water Act (CWA) section 303(d) list of impaired waters as threatened for not supporting their aquatic life uses. In response, the Lake DeSmet Conservation District (LDCD) and landowners implemented best management practices (BMPs), including updating irrigation techniques, improving water conveyance and constructing sediment detention wetlands. Subsequent WDEQ monitoring confirmed that the activities improved irrigation efficiency and diminished sediment input to the creeks. As a result, WDEQ removed the two streams from the Wyoming 2008 CWA section 303(d) list of impaired waters.

Problem

The headwaters of Wyoming's North Fork Shell Creek and South Fork Shell Creek (Figure 1) are in the Powder River basin (Figure 2), along the foothills of the east slope of the Bighorn Mountain Range. The creeks flow northeast into Shell Creek Reservoir near the town of Story. The two forks of Shell Creek are protected for agricultural, industrial, recreational, wildlife, scenic value and aquatic life (other than fish) uses.

Data collected by the LDCD in 2000 indicate that the aquatic life (other than fish) use for the streams was threatened because of sedimentation from habitat degradation related to irrigation diversions and conveyance. On the basis of that data, WDEQ added a total of 16.69 miles of the north and south forks of Shell Creek to the 2000 CWA section 303(d) list of impaired waters for habitat degradation.

Project Highlights

Several landowners and LDCD implemented multiple BMPs between 1999 and 2001 using funding from a CWA section 319 grant to address the habitat issues affecting the two watersheds. BMPs included replacing surface ditches with buried pipelines, changing inefficient flood irrigation to center pivot irrigation, constructing wetlands and upgrading water conveyance control structures. LDCD monitored the macroinvertebrate community, water quality, and in-stream habitat in both

Figure 1. Photographs showing the North Fork (top) and South Fork (bottom) of Shell Creek.

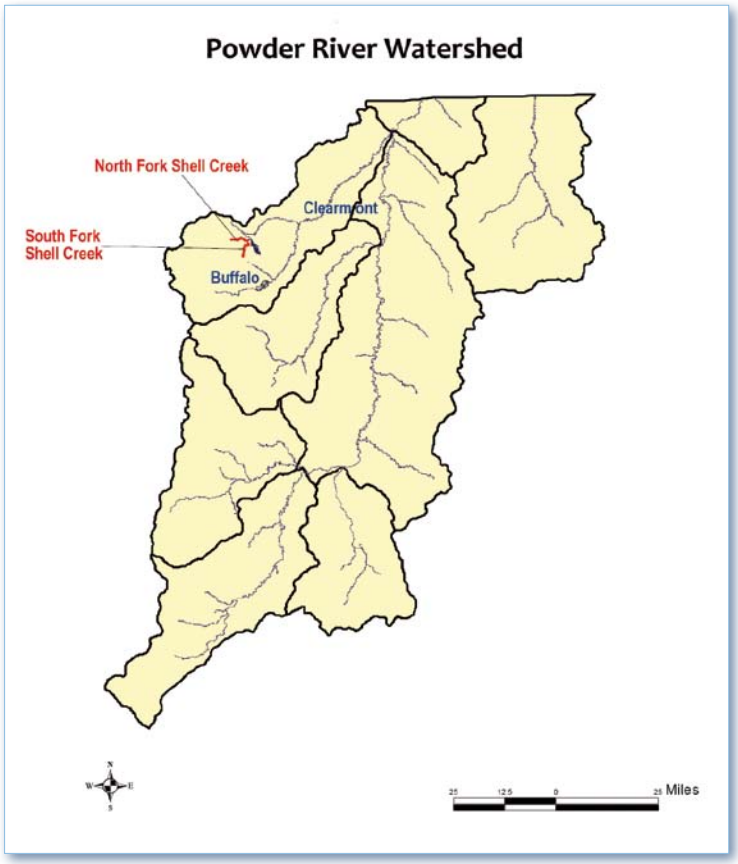

Figure 2. This map shows the impaired portions of North Fork Shell Creek and South Fork Shell Creek. These creeks are headwaters of Wyoming's Clear River watershed (HUC 10090206), a tributary of the Powder River.

waterbodies to assess how effectively the BMPs mitigated sedimentation.

Results

LDCD's macroinvertebrate and in-stream habitat surveys show a positive change in silt depth that corresponds to BMP implementation. LDCD also collected water quality data that show total suspended solids, turbidity and temperature levels decreased. However, LDCD had to classify the data as inconclusive because it believes that a severe drought in 2000 and 2001 might have confounded study results. In 2005 and 2006 WDEQ conducted an additional field assessment, which indicated that the BMPs had mitigated irrigation and water conveyance issues. WDEQ found that macroinvertebrate samples from both forks were comparable to the reference stream and therefore assigned a rating of full support of aquatic life using the Wyoming Stream Integrity Index and the River Invertebrate Prediction and Classification System. On the basis of those findings, WDEQ removed North Fork Shell Creek and South Fork Shell Creek (a total of 16.69 miles) from the Wyoming 2008 CWA section 303(d) list of impaired waters.

Partners and Funding

LDCD received a total of $178,743 in CWA section 319 funding along with $285,687 of in-kind matching funds. LDCD partnered with several landowners to implement BMPs and monitor project results at various locations throughout each of the two watersheds.

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For additional information contact:

Richard Thorp
Wyoming Department of Environmental Quality
307-777-3501 • rthorp@wyo.gov

Nikki Lohse
Lake DeSmet Conservation District
307-684-2526 ext. 3 • Nikki.lohse@wy.nacdnet.net