Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Tennessee

Reducing the Impacts of Cattle Grazing Improved Water Quality

Waterbody Improved

Polluted runoff from pasture-grazing cattle and erosion of sensitive pastureland degraded the water quality of Cripple Creek. This led to the listing of a 7.7-mile segment of Cripple Creek as impaired in 2002. Several best management practices (BMPs) were implemented, including pasture renovation, grassed waterways, and a livestock watering facility. This resulted in water quality improvements of the 7.7-mile segment of Cripple Creek and its removal from the 2004 list of impaired waters.

Problem

Cripple Creek is located in the East Stones River Watershed in Rutherford County, Ecoregion 71i. The creek was listed as impaired on the 2002 303(d) list for siltation, which is a common pollutant of surface waters. Siltation can cause significant economic impacts such as increased water treatment costs, loss of storage capacity in reservoirs, direct impacts to navigation, and the increased possibility of flooding. The state identified pasture grazing as the major source of impairment. A siltation total maximum daily load (TMDL) was established in 2002 by Tennessee's Department of Environment and Conservation for Cripple Creek.

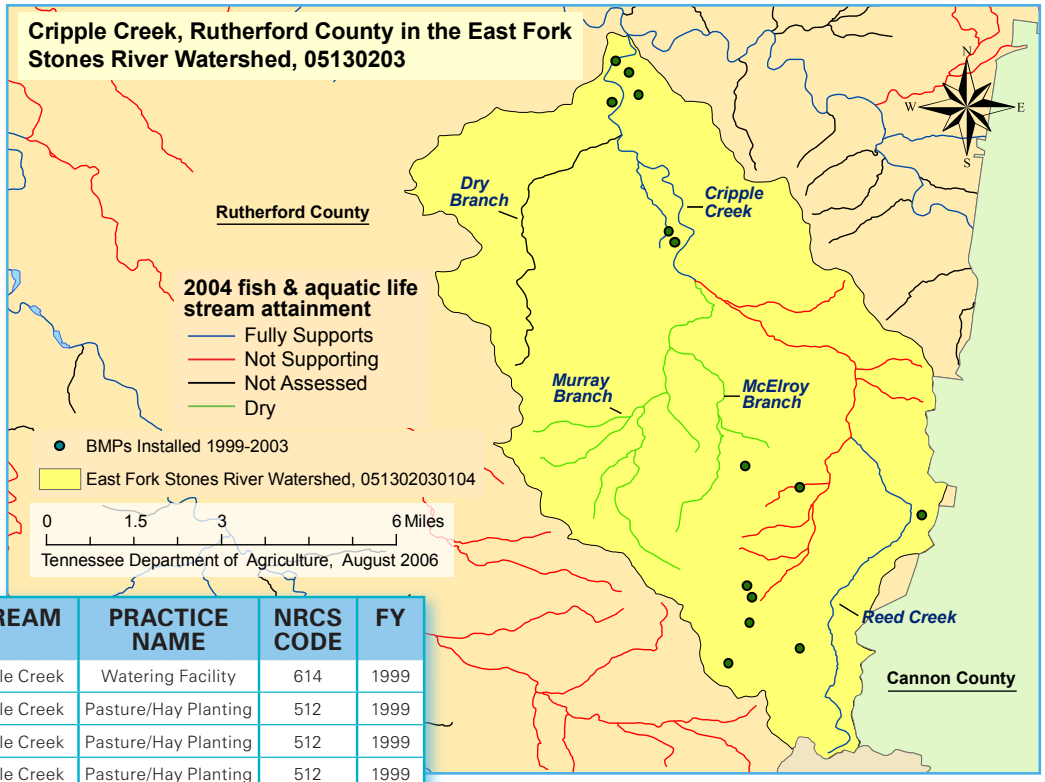
Cripple Creek was listed for not meeting the state water quality standard for siltation in order to fully support its designated beneficial use of fish and aquatic life. The standard states that there shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.

Project Highlights

Fourteen BMPs were implemented by the Rutherford County Soil Conservation District from 1999 to 2003 in the East Stones Fork River Watershed. Over 157 acres were renovated as a result of replanting pasture lands and the implementation of grassed waterways (Figure 1). Grassed waterways are graded natural structures that improve water quality by conveying runoff without causing flooding or erosion, and help to reduce gully erosion. In addition, an alternative livestock watering facility was implemented to provide accessible water for livestock. The watering facility has several positive effects: 1) it protects and enhances vegetative cover through proper distribution of grazing, 2) it provides erosion control through better grassland management, and 3) it protects Cripple Creek and other water supplies from contamination by providing livestock with alternative access to water.

Results

Using EPA's rapid bioassessment protocol III (RBPIII), state biologists calculated a biological reconnaissance (biorecon) score for Cripple Creek, which is used to measure compliance with the state water quality standard for siltation. Biorecon is one tool used to recognize stream impairment as judged by species richness measures, emphasizing the presence or absence of indicator organisms without regard to relative abundance. The biorecon index is scored on a scale from 1 – 15. A score less than 5 is regarded as very poor. A score over 10 is considered good. The principal metrics used



ID	COUNTY	HUC	STREAM	PRACTICE NAME	NRCS CODE	FY
5746	Rutherford	5130203	Cripple Creek	Watering Facility	614	1999
5760	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	1999
5761	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	1999
5762	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	1999
5764	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	2000
5792	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	2001
5795	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	2001
5800	Rutherford	5130203	Cripple Creek	Grassed Waterway	412	2001
5805	Rutherford	5130203	Cripple Creek	Grassed Waterway	412	2002
5812	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	2002
7599	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	2003
7600	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	2003
5748	Rutherford	5130203	Cripple Creek	Pasture/Hay Planting	512	1999
5825	Rutherford	5130203	Cripple Creek	Grassed Waterway	412	2002

Figure 1. Map of Implemented BMPs. Table (left) is a list of implemented BMPs.

are the total macroinvertebrate families (or genera), the number of families (or genera) of mayflies, stoneflies, and caddisflies (EPT), and the number of pollution intolerant families (or genera) found in a stream. The biorecon results for Cripple Creek indicated 8 EPT families, 3 pollutant intolerant taxa, and 20 total families. Using the scoring system for biorecons, this stream scored a 15. The stream got a habitat score of 146, which is better than the established habitat goal for this ecoregion. Water quality standards were also met at a chemical station located on the creek at mile 0.4, resulting in the delisting of Cripple Creek from the 2004 303(d) list.

Partners and Funding

The Rutherford County Soil Conservation District helped implement the BMPs with section 319 funding. $7,143 of section 319 funding was matched with $3,146.86 in local contributions. The Tennessee Agricultural Resources Conservation Fund (ARCF) provided an additional $9,341.02, $3,699.22 of which was locally matched.

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