



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Kansas

Implementing Best Management Practices Reduces Bacteria Levels in the Allen Creek Watershed

Waterbodies Improved

Nonpoint source pollution generated from cattle grazing and stream access activities resulted in high levels of bacteria in Kansas' Allen, Dows, and Stillman creeks. In 1998 the Kansas Department of Health and Environment (KDHE) added two segments of the main stem of Allen Creek and two Allen Creek tributaries, Dows Creek and Stillman Creek, to the state's Clean Water Act (CWA) section 303(d) list of impaired waters for bacteria. Landowners cooperated with local, state, and federal agencies to implement best management practices (BMPs) in the watershed. Water quality monitoring since 2003 indicates that Allen Creek and its tributaries now meet the water quality standards for bacteria. As a result, KDHE removed all four segments from the state's list of impaired waters in 2012.

Problem

Allen Creek originates in north-central Lyon County and flows south for 31 stream miles until it merges with its tributaries and empties into the Neosho River in east-central Kansas. The Allen Creek watershed is part of the 421,946-acre Neosho Headwaters watershed (Figure 1).

The Allen Creek watershed is predominately grassland (68 percent), which is used for grazing cattle. Another 20 percent of the watershed is composed of cropland. The remaining 12 percent of land includes woodlands, water, and other uses. Allen, Dows, and Stillman creeks are designated as primary recreation use Class C waters, indicating that the public is restricted by private property from accessing the streams for swimming and other full-body-contact recreation.

Water quality monitoring data collected since 1991 by KDHE indicated that Allen Creek exceeded the state's bacteria criterion of 200 fecal coliform colony-forming units (CFU) per 100 milliliters (mL). As a result, KDHE added two segments of Allen Creek, along with Dows Creek and Stillman Creek, to the state's 1998 CWA section 303(d) list of impaired waters for bacteria. In 2003 the basis for the bacteria standard changed from fecal coliform to *Escherichia coli*. In addition, the basis for determining a violation of state standards for waterbod-

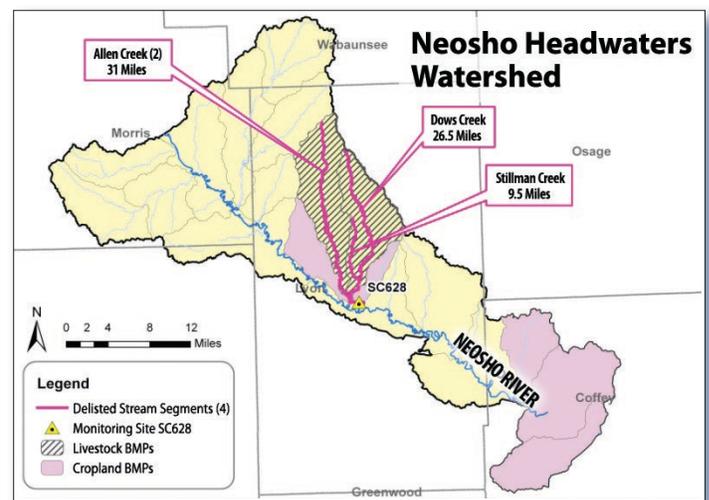


Figure 1. Allen, Dows, and Stillman creeks are in Kansas' Neosho Headwaters watershed.

ies designated as primary recreation use Class C waters became five samples collected within 30 days exceeding the geometric mean of 427 CFU/100 mL. A total maximum daily load (TMDL) for Allen Creek and its tributaries was developed and approved in 2002 to direct efforts to reduce the bacteria impairments in the watershed. The TMDL identified small, unregulated livestock operations and rural homesteads along the streams as potential nonpoint sources of bacteria loading.



Figure 2. Partners installed numerous BMPs, including this streambank protection project on Dows Creek.

Project Highlights

Following the U.S. Environmental Protection Agency's (EPA's) approval of the TMDL in 2002, the Lyon County Conservation District, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), local landowners, and Neosho Headwaters Watershed Restoration and Protection Strategy (WRAPS) partners implemented agricultural and livestock BMPs throughout the Allen Creek watershed. They installed 586 acres of access control and streambank protection; added 2 acres of critical planting to reduce runoff into the creeks; installed 4,168 feet of fence; added 2 acres of filter strips (dense grass sod strips that serve as a border around cropland, which can filter pollutants in agricultural runoff); built 4,507 feet of pipeline to facilitate alternative watering systems; constructed a pond; and implemented 750 acres of prescribed grazing (Figure 2).

Results

KDHE completed sampling on Allen Creek on a rotational schedule; sampling occurred during the primary recreational seasons in 2003, 2007, and 2011. Water quality samples showed that *E. coli* levels were below the state's criterion of 427 CFU/100 mL in all but four cases (Figure 3). In addition to the rotational scheduled monitoring, inten-

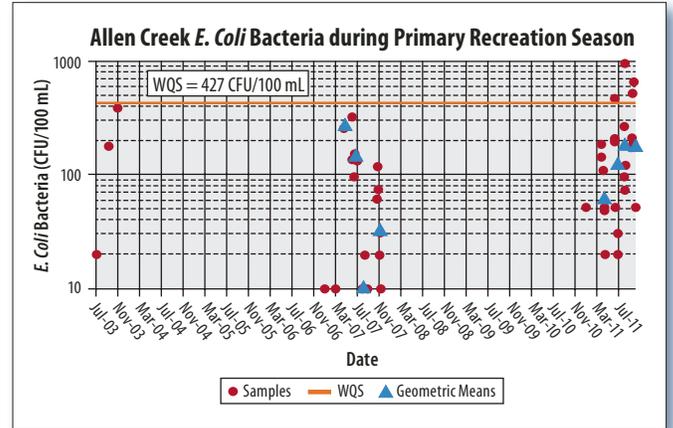


Figure 3. *E. coli* bacteria values during primary recreation season for Allen, Dows, and Stillman creeks.

sive monitoring occurred on four occasions in both 2007 and 2011. In all cases, the geometric means remained below the criterion value. As a result of the water quality samples meeting the criterion, KDHE removed Dows Creek (26.5 miles), Stillman Creek (9.5 miles), and two segments of Allen Creek (totaling 31 miles) from the state's list of impaired waters in 2012.

Partners and Funding

The success of the delisting and water quality improvements can be attributed to several local, state, and federal partners, including the Neosho Headwaters WRAPS, Flint Hills Resource Conservation and Development Council, Kansas Forest Service, Kansas Department of Agriculture's Division of Conservation, Kansas Water Office, Kansas Water Authority, NRCS, Lyon County Conservation District, Kansas Department of Health and Environment, Kansas Rural Center, Kansas State University, EPA Region 7, and participating landowners.

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