



NONPOINT SOURCE SUCCESS STORY

Missouri

Planning and Partnerships Improve Water Quality in McCoy Creek

Waterbody Improved

As a result of impacts from urban and agricultural runoff, McCoy Creek was listed on Missouri's Clean Water Act (CWA) section 303(d) list of impaired waters for low dissolved oxygen (DO) in 2012. To address the impairment and concerns about future urban growth, partners completed a nine-element watershed-based plan (WBP) for the Dry Branch Creek watershed (a subwatershed of McCoy Creek) and implemented green infrastructure projects. Best management practices (BMPs) were also applied in agricultural areas within the watershed. Water quality data collected in 2016 showed that all DO concentrations met the state's water quality standard (WQS), resulting in a segment of McCoy Creek being removed from the CWA section 303(d) in 2018.

Problem

McCoy Creek, in northwestern St. Charles County, is a tributary of the Cuivre River. The upper reaches of McCoy Creek drain the unincorporated rural and agricultural areas of St. Charles County, while the middle and lower reaches drain portions of the cities of Flint Hill (to the north) and Wentzville (to the south). The three main tributaries of McCoy Creek receive runoff from agricultural and forested areas, as well as the urbanized areas of Wentzville, Interstate 70, and State Highway 40/61 (Figure 1).

In 2012, a 1.9-mile segment of McCoy Creek (WBID 0214) was listed on Missouri's CWA section 303(d) list of impaired waters for low DO due to unknown reasons. As the population of Wentzville grew from 6,896 in 2000 to 29,070 in 2010, a greater percentage of the rural landscape changed to urban to accommodate the growing numbers. The percentage of impervious surfaces, stream flow and its erosive power, and the amount of nonpoint source (NPS) pollution transported into the surrounding waterways increased. Increases in stream temperatures, excessive algal growth, and sediment loads commonly contribute to low DO and negatively impact aquatic life.

Story Highlights

The City of Wentzville completed a nine-element WBP for the Dry Branch Creek watershed (a subwatershed of McCoy Creek) in 2013 and implemented a variety of retrofit enhancements between 2011 and 2015. The

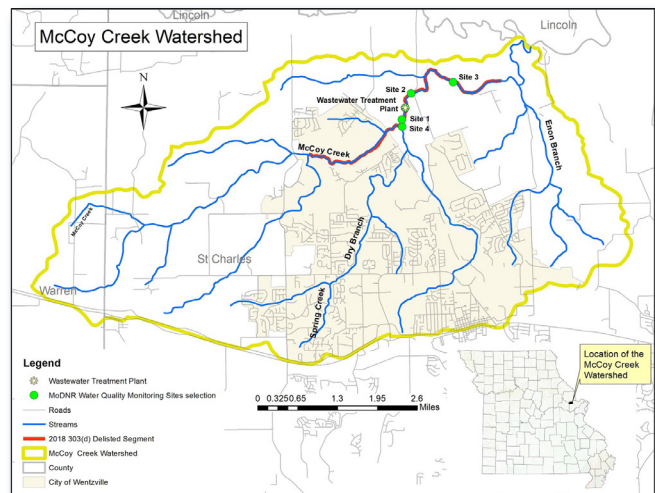


Figure 1. McCoy Creek is in eastern Missouri.

St. Charles Soil and Water Conservation District (SWCD) provided cost-share dollars to implement cover crops on 107 acres of agricultural area within the McCoy Creek watershed to reduce soil erosion, increase water infiltration, and improve water quality and soil health. Retrofits were completed at existing urban retention basins on commercial properties and in residential subdivisions in partnership with property owners. A number of green infrastructure BMPs were constructed in the McCoy Creek watershed. A car wash detention basin was expanded and reconfigured as a rain garden to filter stormwater runoff. Rain gardens and native shoreline plantings were added to a subdivision's common ground area to pretreat high-temperature runoff from 20 acres (Figure 2). A series of green infrastructure pilot projects



Figure 2. Native plants were planted along the shoreline of a basin in the Huntsdale Subdivision.

(e.g., vegetated bioswales, pervious pavements, riparian areas, and native plantings) were implemented at a city park. A forebay was constructed at the inlet of a regional detention lake to capture and trap sediment and nutrients from a 472-acre drainage area. Partners also installed parking lot bioswales; athletic field biofilters/rain gardens; three different types of pervious pavements; wetlands; riparian areas; and over 2,500 trees, shrubs and native plants. Additionally, educational shelters and interpretive signage were constructed throughout the park and along an educational trail system.

Results

In 2012, 15 water quality monitoring events occurred on McCoy Creek at three locations twice a day during the early morning and late afternoon hours. The sites were located on McCoy Creek, downstream of the

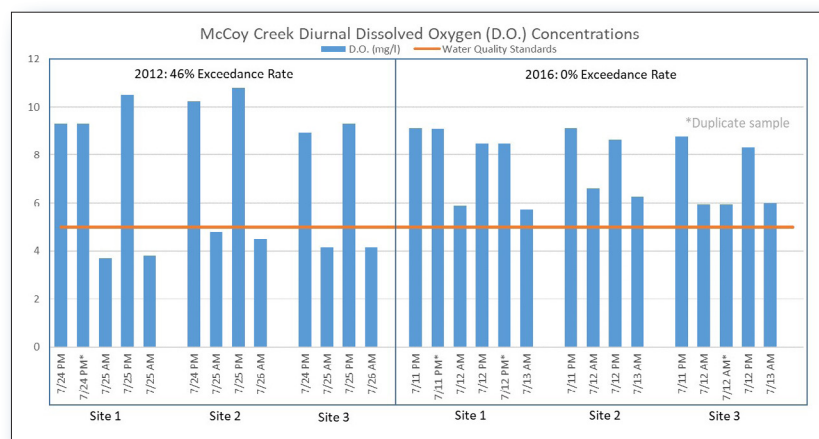


Figure 3. A comparison of the 2012 and 2016 dissolved oxygen exceedance rates in the morning (AM) and late afternoon (PM) at three instream monitoring sites show improvement.

confluence of Dry Branch Creek to bracket inputs related to NPS pollution and the wastewater treatment plant (WWTP). Low DO levels were noted both above the WWTP (site 1, NPS inputs) and below the WWTP (sites 2 and 3, WWTP input): a total of 46 percent of the DO levels exceeded the state WQS. The sampling event was repeated in 2016. The results showed improved conditions.

The water quality improvements upstream of the WWTP (site 1) can be attributed to the implementation of on-the-ground practices to address NPS runoff through the 319 NPS project efforts, the City of Wentzville's Clear Stormwater and Green Parks initiative and community outreach efforts, implementation of a countywide stream buffer ordinance, and cost-share practices implemented through the St. Charles SWCD. Water quality improvements at site 2 and 3 can be contributed to upgrades occurring at the WWTP. From the 2016 sampling event, all the DO data met or exceeded state water quality criteria (Figure 3).

Partners and Funding

Partners involved in the project included the City of Wentzville; the Wentzville Stormwater Advisory Committee; St. Charles SWCD; Wentzville School District; Oasis Kwik Car Wash; Huntsdale Subdivision Homeowner's Association; SCI Engineering, Inc.; Water Resources Solutions; Shocky Consulting; Teklab, Inc.; Landesign, LLC; Bernardin, Lochmueller & Associates; Demien Construction; Greenway Network, Inc.; the

City of Flint Hill; St. Charles County; and the Missouri Department of Natural Resources. The total cost of the Dry Branch Watershed Clean Stormwater and Green Parks Section 319 NPS Grant Project and partner contributions was \$1,248,015 for the completion of a nine-element WBP, water quality monitoring, demonstration infiltration projects at four sites, and a citywide educational outreach campaign and stream-naming contest. Since 2012, the St. Charles SWCD provided \$3,424 in state cost-share dollars to implement cover crops on 107 acres within the McCoy Creek watershed.



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