



# NONPOINT SOURCE SUCCESS STORY

## Indiana

### Agricultural Best Management Practices are a Boon for Macroinvertebrate Communities in Little Deer Creek

#### Waterbody Improved

Little Deer Creek is an 11.94-mile-long tributary of Deer Creek in Carroll and Howard counties. The Indiana Department of Environmental Management (IDEM) listed the stream on its Clean Water Act (CWA) Section 303(d) List of Impaired Waters in 2016 for high levels of *Escherichia coli* and in 2018 for impaired biotic communities. These and other pollutants have been a persistent problem in the greater Deer Creek-Sugar Creek watershed and led to the creation of the Deer Creek-Sugar Creek Watershed Management Plan (WMP) in 2014. Various agricultural best management practices (BMPs) were implemented in the following years, and follow up sampling on Little Deer Creek in 2019 indicated that the segment now fully supports aquatic life. IDEM will propose to remove the biotic community impairment from its impaired waters list in 2022.

#### Problem

Little Deer Creek joins with Deer Creek in Carroll County, just southeast of Camden, in north central Indiana (Figure 1). Its water flows through the larger Deer Creek-Sugar Creek watershed and eventually drains into the Wabash River. The Little Deer Creek subwatershed covers approximately 20 square miles, with agricultural land uses accounting for the majority of the subwatershed. According to the 2014 Deer Creek-Sugar Creek WMP, a 2013 windshield survey identified livestock access and streambank erosion as the major stream-related concerns for Little Deer Creek.

In 2015, IDEM's Probabilistic Monitoring Program sampled Little Deer Creek (INB0553\_01) and discovered a failing Index of Biotic Integrity (IBI) score of 32 for its macroinvertebrate community. An IBI score of less than 36 in Indiana indicates that a stream is not supporting a well-balanced aquatic community. This led IDEM to list the segment on its 2018 CWA Section 303(d) List of Impaired Waters for impaired biotic communities.

#### Story Highlights

In fall 2010, the Carroll County Soil and Water Conservation District (SWCD) submitted a CWA Section 319 Nonpoint Source Program grant application to IDEM and identified watershed partners that would

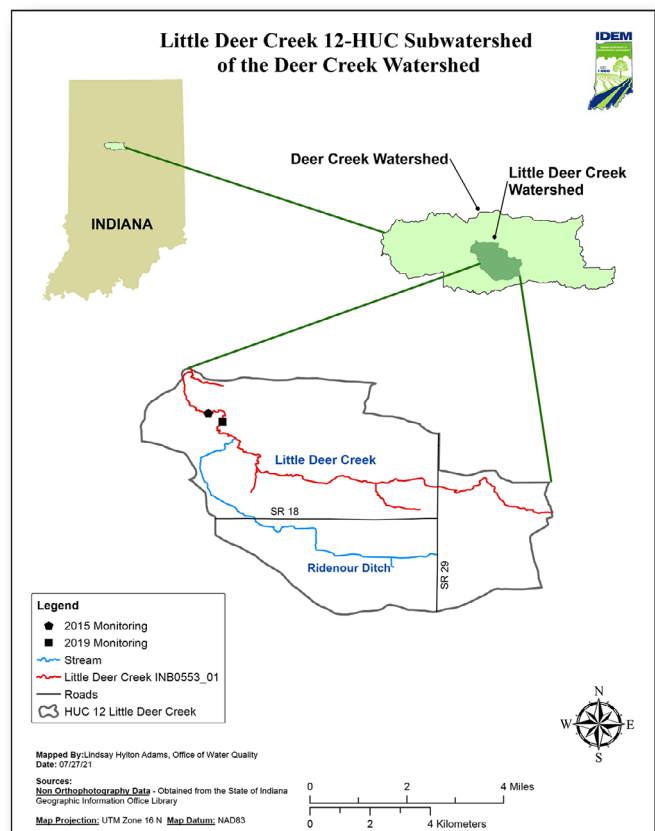


Figure 1. Little Deer Creek (HUC 051201050503) is in the Deer Creek watershed in north central Indiana.

become part of the project's steering committee. The purpose of the grant was to produce a WMP for the Deer Creek-Sugar Creek watershed, provide education and outreach to the community, assess stakeholder opinions, monitor water quality, and develop a cost-share program. The project's overarching goal was to improve water quality in the Wabash River. The grant was awarded, and the Deer Creek-Sugar Creek WMP was approved in 2014.

The Carroll County SWCD received a 319 implementation grant in 2011 and again in 2017, totaling \$859,626, which supported implementing over 3,995 acres of cover crops, 203 acres of nutrient management with manure, 124 acres of no-till field management, 130 acres of mulch-till field management, 0.2 acres of grassed waterways, one waste facility closure, one stream crossing, two heavy use protection areas, one mulch-till equipment modification, one nutrient management equipment modification, one no-till equipment modification, three cover crop equipment modifications, and one conservation plan in the Little Deer Creek subwatershed (Figure 2). Additionally, the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) helped implement 2,178 square feet of seasonal high tunnel for crops and 1,018 acres of cover crops in the subwatershed in 2015–2017 through the Environmental Quality Incentives Program (EQIP).

## Results

In 2019, IDEM returned to Little Deer Creek to conduct follow up performance monitoring on the stream. The monitoring now showed an improved macro-invertebrate IBI score of 40. The fish IBI (which was not previously failing) had also remained the same, with a score of 46. Although the Qualitative Habitat Evaluation Index score decreased from the 2015 score, it was still passing and showed improvement in the individual scores for bank erosion and riparian zone quality. As a result, IDEM is proposing to remove the biotic community impairment for Little Deer Creek from the list of impaired waters in 2022.

## Partners and Funding

The Little Deer Creek subwatershed has benefited greatly from various partnerships aimed at restoring the greater Deer Creek-Sugar Creek watershed.



Figure 2. Closing wheel equipment modification for no-till corn and soybean planting.

The Wabash River Enhancement Corporation was responsible for writing the Deer Creek-Sugar Creek WMP, in addition to guiding plan development, coordinating and facilitating committee meetings, and planning and implementing water quality and watershed information gathering. Purdue University was also responsible for collecting and analyzing water quality data and conducting stakeholder surveys. The \$859,626 in CWA 319 grant funding awarded to the Carroll County SWCD for planning and implementation projects in 2011 and 2017 resulted in the development of the WMP, extensive agricultural BMP implementation within the Little Deer Creek subwatershed, as well as technical assistance and education efforts. Furthermore, the Carroll County SWCD provided local match of around \$96,133 in 2015–2019 for these BMPs and a total of \$890,626 to date for the two 319 projects as a whole. The NRCS also played a role in the watershed's improvement by providing BMP promotion, design and installation at a total cost of \$53,768 through EQIP.



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