

Turning vision into reality: A case study on the Middle Cedar River Watershed

Improving land and water resources is a challenging and complex task requiring collaboration, partnerships and practice adoption. By working together to achieve the same goals and outcomes, urban and rural partners can better prepare and respond to challenges.

The City of Cedar Rapids draws its drinking water from shallow alluvial wells along the Cedar River. Elevated nitrate levels in the Cedar River resulted in an impairment listing for nitrate in 2004, and a Total Maximum Daily Load (TMDL) was developed subsequently in 2006 that targeted a 35 percent nitrate load reduction.

A large majority — 70-75 percent — of the drinking water produced by Cedar Rapids Water Treatment facilities is distributed to large food production industrial users, such as PepsiCo, Cargill and General Mills. A devastating economic ripple effect would be put into motion if the city were unable to consistently provide a safe, high quality water product for these industrial consumers to use in their processes.

Without sustained efforts to manage nutrient loading in the larger Cedar River Watershed, it will become increasingly difficult and costly to treat the City of Cedar Rapids' raw water sources in order to provide a safe and adequate supply of drinking water.

Along with water quality, flooding is an ongoing concern in the Cedar River Watershed with multiple communities experiencing considerable flood damage and associated economic impacts. Cedar Rapids alone sustained \$5 billion in damages from the 2008 floods — the second 500-year flood event in 15 years. Additionally, La Porte City, Vinton and Palo suffered significant impacts. Most recently in the summer of 2014, the Cedar River reached major flood stage again at Cedar Rapids with considerable damage to personal property and city infrastructure.

Seeking Solutions

In a proactive venture, the City of Cedar Rapids and 15 partners, primarily commodity or conservation groups, entered into a five-year partnership agreement to implement various conservation practices proven to reduce impacts from farm-field runoff upstream of the City's source-water well fields.

The project, titled the Middle Cedar Partnership Project (MCP), combines downstream water users, specifically the City of Cedar Rapids, with upstream agriculture and conservation entities to address the primary concern of water quality, specifically reduction of nitrate loads to the Cedar River. The secondary resource concerns include flood reduction and soil health.

The partnership project begins a new era in terms of water quality protection and additional flood control.

Initial partnership efforts will focus on five targeted subwatersheds of the Cedar River. The project serves to connect downstream consumers with upstream producers who can work together to reduce the overall environmental impacts to Iowa streams and rivers. The MCP is investing in key infrastructure, watershed planning and partnerships to improve water quality and mitigate flood risk.

Watershed Planning

The first step of the MCPP was to develop watershed plans for the five targeted subwatersheds in Black Hawk, Benton and Tama counties. A watershed plan provides a comprehensive vision for improving land and water quality over a period of time.

The Iowa Soybean Association (ISA) led development of the Miller Creek Watershed Plan, one of the targeted subwatersheds, by working with farmers and conservation groups in the Miller Creek drainage area. The Miller Creek Watershed encompasses 42,461 acres that drain to the point where Miller Creek meets the Cedar River near Gilbertville.

The planning document defines and addresses existing land and water quality conditions and shortfalls, and provides a path for improvement. Plan development followed an established watershed planning process and incorporated input from many different stakeholders, both public and private.

ISA and the Black Hawk County Soil and Water Conservation District (SWCD) utilized an advisory committee to capture farmer input. All available water quality data was gathered, visual inspections of the stream corridor were conducted and inventories of land use and management practices were collected.

Watershed goals were identified and solutions developed using input from the advisory committee.

A conceptual plan, or map of conservation and agricultural practices, was developed using computer modeling and mapping to meet the desired goals. Science from the Iowa Nutrient Reduction Strategy allowed watershed planners to balance practice performance with farmer and landowner willingness to implement the practices. Combining these factors allowed development of a conceptual plan identifying locations for practice placement to achieve maximum benefit.

An implementation schedule was developed to provide a timeline for meeting the plan's goals. The schedule is both environmentally and economically sustainable given current funding availability. Methodologies and schedules track implementation and progress toward goals, facilitate communication and education with stakeholders, identify technical and financial assistance and evaluate effectiveness.

Implementation

In 2014, Black Hawk SWCD received a multi-year grant totaling nearly \$500,000 from the Iowa Department of Agriculture and Land Stewardship's Water Quality Initiative fund to implement conservation practices. Moreover, the MCPP will provide an additional \$2 million of funding to the watershed and other nearby watersheds, over five years to further advance implementation.

A watershed monitoring strategy is included in the Miller Creek Watershed Plan to help local decision makers assess water quality improvements over time. Monitoring is important to track progress and make adjustments. The plan should adapt to new technologies, watershed conditions and available resources.

The Miller Creek Watershed Plan balances current resources with the desire to make land and water improvements. A 15-year phased implementation schedule allows for continuous improvements that will be evaluated to ensure progress toward desired goals. The investment needed to achieve goals identified in the Miller Creek Watershed Plan is nearly \$5 million for constructed practices, including

wetlands and bioreactors, among others. Additional investment — approximately \$600,000 — is needed on a year-to-year basis to ensure management practices, such as cover crops, are implemented.

Cedar River Vision

Addressing water quality and flooding in the entire Cedar River Watershed will require long term vision, commitment from farmers, landowners and stakeholders, as well as significant public and private investment. The 7,485 square mile Cedar River Watershed comprises 224 subwatersheds. Although the MCPP addresses only five subwatersheds, this approach exemplifies how partnerships can provide greater focus and resources.

To achieve success, future efforts must efficiently and accurately target the highest contributing subwatersheds. These areas should be identified through a combination of monitoring and modeling. For instance, the Upper Cedar Watershed Management Authority recently completed a watershed plan for the full Upper Cedar Watershed, a 1,685 square mile subwatershed of the Cedar River. The Upper Cedar Watershed plan prioritized subwatersheds by area of greatest need. This approach enables action and resources where they will have the most impact and should be adopted throughout the entire Cedar River Watershed.

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