

Meeting Update: Sustainable Groundwater Use In The Little Rock Creek Area

On December 5, staff from the Minnesota Department of Natural Resources met with Little Rock Creek Area stakeholders to update them on work DNR has been doing to better understand Little Rock Creek, the aquatic life it supports and how that may or may not be affected by groundwater pumping.

DNR project manager Mark Hauck started the meeting by recapping a public field day in August, where techniques for assessing stream health were demonstrated. DNR's Jason Moeckel, head of the agency's Water Resources' Information, Monitoring and Analysis section, then facilitated a question and answer session, which included questions submitted by a group of area farmers and irrigators.

Irrigation Flow Meter Study

Joy Loughry, Water Monitoring and Surveys (WMS) unit supervisor for DNR's Division of Ecological and Water Resources, described the first year of a two-year study aimed at assessing the accuracy of different methods of measuring and estimating groundwater use. DNR is working with eight local irrigators who have agreed to attach a flow meter to their nine irrigation systems. The study will help understand and compare different methods of measuring and estimating water used, which can help DNR determine if any adjustments in reported water use are needed for DNR's groundwater flow analysis. Results from the first year show:

- Pumping volumes measured by DNR were less than the reported pumping volume at seven of the nine sites, and higher than reported volumes at two sites.
- The smallest difference between what DNR measured and what the permittee reported was 2.8% (measured amount was more than reported) and the largest difference was 36.2% (measured amount was less than reported).
- DNR will receive 2019 water use information from local irrigators this winter and will analyze the results and share those results with partners and other interested parties.

Having accurate information about groundwater use is important as DNR works to analyze groundwater flow and how pumping might affect Little Rock Creek.

Water Velocity Study in Little Rock Creek

Jeremy Rivord, a DNR WMS Hydrologist Supervisor, explained how the agency has been using dye tracing tests to study the speed at which water flows through Little Rock Creek under different

conditions. The study is part of efforts to understand what effect the Sartell Wildlife Management Area dam has on water temperatures. Little Rock Creek is a cold water stream and is home to fish that need cold water to survive. Stream water can get warmer in ponded areas from sunlight.

By pouring a non-toxic dye into the stream, DNR has been able to determine how long it takes water to move through Little Rock Creek when the stream is low, when it's high, and when stop logs are removed from the Sartell Wildlife Management Area dam. So far, the study indicates that the difference of a high flow compared to a low flow can be 7.5 hour difference in the amount of time for water to travel through the 6.7 mile study area. Removing the stop logs also reduced the travel time by several hours. These water velocity results will be combined with water temperature data to analyze the relationship between stream flow and temperatures.

Physical Habitat Simulation Analysis

Dan O'Shea, Research Scientist for DNR's Division of Ecological and Water Resources, described work the River Ecology Unit is doing to understand the aquatic habitat of Little Rock Creek and how it changes under different stream flow conditions. This research will help the DNR set a sustainable diversion limit that will avoid negative impacts to surface waters. The sustainable diversion limit sets a scientifically based threshold for the water level needed in the stream to avoid ecosystem harm and support its aquatic organisms, such as fish and insects. As part of its data collection over the past two years, DNR staff measured and documented the streambed and streambanks in a representative section of Little Rock Creek that holds a variety of fish species. The known habitat needs of each species will be combined with the stream model to evaluate how different species might be affected by changes in stream flow. Data collection was completed in 2019, with analysis underway now and likely completed by fall of 2020.

Next steps

The work DNR staff described at the December meeting has all been guided by the "[Sustainable Use of Groundwater in the Little Rock Creek Area Plan](#)." The plan's aim is to assure that use of groundwater remains sustainable and consistent with state laws. By conducting monitoring and analysis based on sound science, DNR expects to learn if groundwater use in the area affects Little Rock Creek stream flow and habitat in a way that creates a negative impact. Groundwater use is sustainable as defined by Minnesota Statutes when area groundwater use is able to supply the needs of future generations and the proposed use will not harm ecosystems, degrade water, or reduce water levels beyond the reach of public water supply and private domestic wells.

In the upcoming months, the DNR will:

- Complete the water velocity study in Little Rock Creek near the Sartell Wildlife Management Area impoundment.
- Complete the two-year physical habitat simulation analysis in Little Rock Creek.

- Complete the two-year irrigation flow meter study.

The plan also calls upon the DNR to keep community members regularly updated on the progress of its work in the Little Rock Creek area, through meetings, field events, and periodic communications such as this one.

Over the past 4 Years, the DNR has been working with a variety of interests and other agencies to develop and implement plans that will allow farmers, businesses and communities to be able to continue using groundwater where there have been increased risks of overuse and/or contamination. The agency can permit high volume groundwater use only if it is sustainable as outlined in Minnesota statutes and rules.

Contact Information

Questions about this project can be addressed to Mark Hauck, DNR project manager, 320-223-7846, mark.hauck@state.mn.us

For more information on the Little Rock Creek area groundwater project, visit the project web page at www.mndnr.gov/littlerock. For more information on DNR's groundwater management programs, visit www.mndnr.gov/gwmp/index.html.