

Trout Habitat Preservation Project - Documenting Success!

Background

The Trout Habitat Preservation Project (THPP), the first Capitol Improvement Project of the newly formed Brown's Creek Watershed District (BCWD), was a project designed to alleviate flooding surrounding a large land-locked basin while protecting the temperature sensitive resources of Brown's Creek. This project was constructed in 2000.

Goggins, Plaisted, and School Section Lakes, located in the northern portion of the watershed district, had merged as a result of rising lake levels to form one large shallow basin of approximately 440 acres in size. The flooding of homes and septic systems surrounding the merged lake basin was resulting in property damage and presented a threat to lake water quality. The resident's requests for flood relief and resource protection were responded to by the Watershed District, Washington County, the Department of Natural Resources, the Cities of Stillwater and Hugo, May Township and Trout Unlimited.

The BCWD took on the THPP with the knowledge that a traditional surface style outlet would not provide the level of protection needed since the overflow is the headwaters of Brown's Creek, a state protected trout stream. Water from the Goggins/Plaisted/School Section basin was a threat to Brown's Creek due to its high summer temperatures. For this reason, design alternatives minimizing the discharge of warm lake water were evaluated.

The THPP design, devised by District Engineers Emmons & Olivier Resources, Inc., was an innovative approach which tackled the challenges of the project by including infiltration as a key component. The design provided a lake outlet from the flooding basin, created wetland habitat, and used infiltration basins to minimize discharge and thermal impacts to Brown's Creek.

Monitoring of the infiltration basins allowed for the future evaluation of the project.

Overview

Water released from the Goggins/Plaisted/School Section basin and storm runoff from the western ditch flows through the THPP constructed wetlands before entering the infiltration basins. Water slows while passing through the wetlands, allowing sediment and attached pollutants to settle out.

After the first infiltration basin fills, overflow is received by two other infiltration basins where water is allowed to seep back into the groundwater system. Infiltrated water cools and is further cleansed while traveling underground toward Brown's Creek where it re-emerges as baseflow.

Monitoring equipment stationed up and downstream of the infiltration basin complex captures water levels over the spring, summer, and fall.

Infiltration Basin Performance

The THPP project was selected for evaluation by a University of Minnesota graduate student, Christa Bren. Monitoring data collected from construction completion in 2000 through 2005, including precipitation and water levels, was used to assess the performance of the THPP's infiltration basins.

The monitoring data revealed successful basin performance, as well as, a few areas for improvement.

The infiltration rates achieved in the first two complete monitoring seasons were initially higher than expected: approximately 2 cubic feet per second (cfs) in 2001 and approximately 1 cfs in 2002. Over time, the infiltration rates then diminished to an approximate rate of 0.1 cfs. The predicted average sustainable infiltration rate was 0.4 to 0.7 cfs.

The investigation also revealed other details important for the rehabilitation and performance recovery of the infiltration basins. Data suggests that not all of the infiltration basins perform equally. Study results indicated that first two infiltration basins (Basins 1 and 2) perform better than the last infiltration basin (Basin 3).

Next Steps

Investigative soil boring in the western two infiltration basins are being taken in the winter of 2005/06. Soils will be analyzed to assess surface clogging and look for a suitable location for an infiltration trench to augment infiltration performance.

Continuation of site monitoring will provide for future analysis of recovery and augmentation efforts as well as develop a long-term infiltration basin data record.

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