MASON CREEK WATERSHED PROTECTION PLAN

EXECUTIVE SUMMARY

The Mason Creek watershed which is located within Washington, Waukesha, and Dodge Counties, is a 8.2-square mile sub-basin within the upper part of the Oconomowoc River watershed. Mason Creek discharges to North Lake along with the Oconomowoc and Little Oconomowoc Rivers. Several lakes (Friess, Loews, Keesus, Beaver, and Pine) also contribute flow to North Lake. Discharge from North Lake flows through Okauchee Lake, Oconomowoc Lake, Fowler Lake, and Lac La Belle before the Oconomowoc River flows into the Rock River. Historically, Native Americans were attracted to the area for its deep maple and basswood forests, wetlands, clear lakes and wild game. Europeans began to settle in the area in the early to mid-1800s, primarily where the Towns of Erin and Merton are now located, due to the area's lakes and rivers and to experience a rural lifestyle. The settlers quickly began farming the high-quality soil, which resulted in the clearing of forests and natural areas and building homes along the shorelines of the lakes. Over time, farming and associated stream channelization have greatly impacted the water quality and wildlife in this ecosystem.

Adult Brook Trout

Mason Creek is home to a small population of self-sustaining brook trout.

This sensitive gamefish species is like a canary in the coal mine, so it is an indicator of good water quality & fish community conditions.

Target Annual Nonpoint Source Load Reduction Goals for Mason Creek:

92% or 5,355 (lbs) Total Phosphorus and 93% or 883 (tons) Total Suspended Solids

The Mason Creek watershed has been identified as an important contributor of sediment and phosphorus to both the Oconomowoc and Rock Rivers. Mason Creek has been listed as an impaired waterway by the U.S. Environmental Protection Agency (USEPA) and Wisconsin Department of Natural Resources (WDNR). Excessive sediment and nutrient loading to North Lake have led to unnatural conditions such as increased algal blooms, deep water oxygen depletion, and water clarity issues. North Lake has been listed as impaired for high phosphorus loads.

Juvenile Brook Trout

Mason Creek serves as an important nursery area that supports the fishery within North Lake

A significant amount of the nonpoint source loads of phosphorus and sediment to North Lake were found to be coming from the Mason Creek watershed. This fact, along with low dissolved oxygen, elevated water temperature, and degraded habitat, prompted local units of government and organizations to partner with State and Federal agencies to improve the water quality in the Lake and watershed. Although these efforts have had some success, the water quality in North Lake and Mason Creek continues to be a cause for concern. In response, the North Lake Management District and Tall Pines Conservancy worked with the Southeastern Wisconsin Regional Planning Commission to develop the Mason Creek Watershed Protection Plan in cooperation with the City of Oconomowoc, Towns of Erin and Merton, Washington and Waukesha Counties, the WDNR, USEPA, and the Natural Resources Conservation Service (NRCS).

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Mason Creek high quality instream and floodplain buffer reference reach

Strategy for Improvement

In addition to establishing recommended pollutant load reductions, this plan focuses on reducing instream water temperature and protecting/preserving groundwater discharge to mitigate against a warming climate and/or reduced precipitation and to promote the "resistance" and "resilience" of the Mason Creek system. "Resistance" is the ability of a system to remain unchanged in the face of external forces. "Resilience" is the ability of a system to recover from disturbance. The overall strategy of this plan is to identify adaptation approaches that promote resistance and build ecological resilience to reduce the impacts of climate change and other stressors. More specifically, adaptation strategies can be applied in the Mason Creek watershed to increase landscape connectivity and corridors among habitats, restore degraded habitats, and remove other threats and stressors such as invasive species or upland erosion. The goals of the strategies are to enable Mason Creek to meet water quality criteria and maintain a sustainable naturally reproducing brook trout population and the associated coldwater biotic assemblage for future generations.

The Mason Creek Watershed Protection Plan provides a framework for communities to work together on a common mission to protect and improve land and water resources and meet the assigned TMDL load and wasteload allocations. The protection plan is designed to be a practical guide for the improvement of water quality within the Mason Creek watershed. It addresses the management of land surfaces that drain directly and indirectly to streams—and consequently to downstream reaches including North Lake, the Oconomowoc River, the Rock River, and ultimately, the Mississippi River.

Improving Mason Creek will improve North Lake and the Oconomowoc River too!

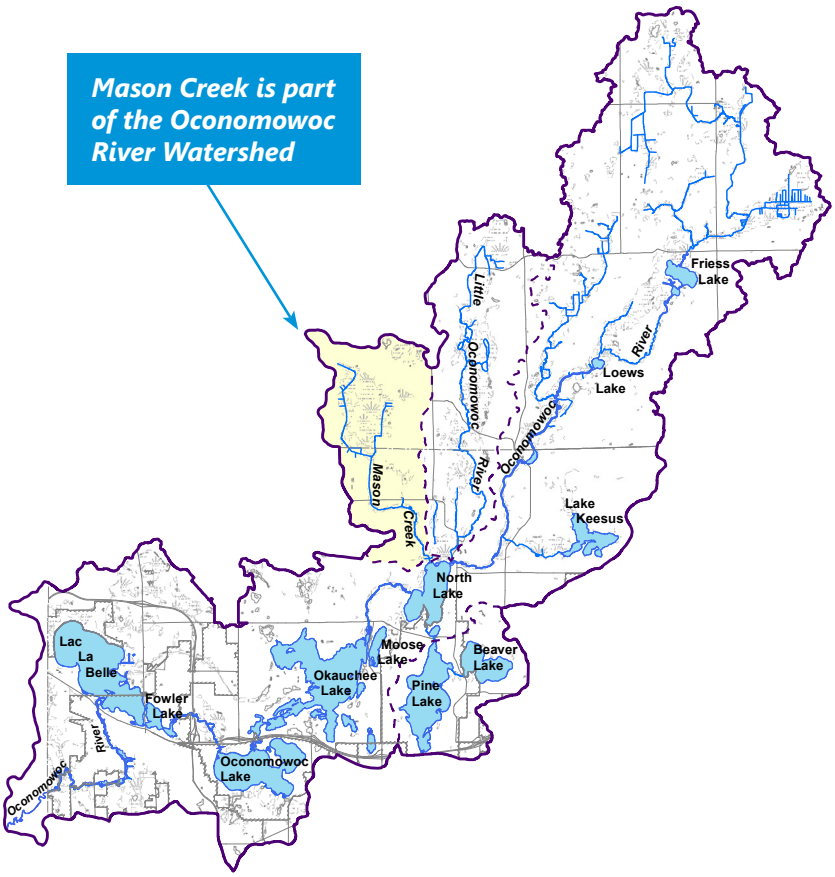
Example of flocculent sediment filling in streambed within the channelized reaches of Mason Creek. September, 2014

Challenges and Pollution Sources in the Mason Creek Watershed

Since at least the early 1900s, the Mason Creek system has been substantially altered through channelization, ditching, agricultural and urban development, road construction, placement of fill, construction of stormwater conveyance systems, and other actions related to these land use changes. These changes have physically, chemically, and hydrologically degraded aquatic habitat and impaired water quality and the associated aquatic community (particularly brook trout). As the dominant land use in the area, agriculture is responsible for nearly 82 percent of the phosphorus loading and 92 percent of the sediment loading to Mason Creek, so a major focus of the plan addresses load reductions from these areas. In addition, streambed load was found to be a significant source of sediment and impairment within Mason Creek, particularly in the channelized reaches and ditched reaches. Channelization is extensive throughout the watershed and is a major determinant of limited instream habitat, degraded water quality, and impaired biological conditions. Therefore, a major focus of this plan is to address these problem areas through wetland restoration, improved floodplain connectivity, and/or re-meandering stream reaches.

Partnership and Participation is Key

One challenge is helping farm operators and landowners to recognize the value of Mason Creek and to become more aware of the water quality issues and the need for conservation practices and sustainable land use management. Although some of the landowners in the watershed have worked with and are aware of County and Federal conservation programs and best management practices (BMPs), significantly greater pollutant load reductions are still needed to meet water quality criteria. To accomplish this, implementation of BMPs needs to be expanded to address a greater proportion of the agricultural land area. The challenge in this watershed is threefold: to develop more opportunities for conservation projects, to install more BMPs, and to ensure the longevity and effectiveness of these projects and practices once they are implemented.



Funding is Available

Fortunately, there is great potential for funding to implement agricultural and urban BMPs within the Mason Creek watershed, because the WDNR and EPA have determined that this watershed-based plan is consistent with EPA's 9-Key Elements. Therefore, the agricultural and urban nonpoint source control projects within the scope of this plan meet EPA-approved TMDL goals and are eligible for WDNR nonpoint related activities and cost-share funding. Hence, this 9-Key Element approved plan is also consistent with the City of Oconomowoc Wastewater Utility's recently established "Adaptive Management Program (AMP)" within the Oconomowoc River watershed. Under the AMP, a total phosphorus concentration of 0.075 mg/L is to be achieved at the confluence of the Rock and Oconomowoc Rivers in the next 15 years. This led to the formation of the Oconomowoc Watershed Protection Program (OWPP) to address the AMP and achievement of water quality criteria. This approach allows point and nonpoint sources (e.g., agricultural producers, wastewater and stormwater utilities, and developers) to work together to improve water quality in those waters not meeting phosphorus standards throughout the Oconomowoc River watershed. This partnership allows combinations of funding from the NRCS, the City of Oconomowoc, and other project partners to be used to offer incentives and matching funding for implementation actions. Hence, the Oconomowoc AMP offers a flexible and robust cost-share funding program to assist landowners with the installation of upgraded conservation practices in agricultural and urban landscapes within the Mason Creek watershed.

The challenge in this watershed is developing more opportunities for conservation projects, installing more best management practices (BMPs), and ensuring the longevity and effectiveness of practices once BMPS are installed.

Mason Creek (looking upstream) after a storm event before entering North Lake. July, 2014

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Key Management Objectives to Improve Mason Creek:

- **Reduce the loads of sediment and phosphorus from upland sources to improve water quality and enhance and restore stream form and function**
- **Reduce the volume and velocity of runoff from upland areas to streams, increase soil infiltration, and enhance groundwater recharge**
- **Maintain and expand wetland habitats and fish and wildlife habitats and populations**
- **Increase public awareness of water quality issues and participation in watershed conservation activities**

Watershed Protection Plan Elements

A 10-year implementation plan was developed to meet water quality goals for the watershed. The plan recommends best management practices, information and educational activities, restoration practices, and lists the estimated costs, potential funding sources, agencies responsible for implementation, and measures to gauge success.

Recommended Priority Management Practices

Agricultural BMPs Applied to Cropland

- No till
- Cover crops
- Nutrient management planning
- Grassed waterways/filter strips
- Harvestable buffers; wetland buffers; wetland restoration, including ditch plugs to stop sediments

Urban BMPs

- Stormwater runoff management
- Ditch checks/check dams along roadway ditches
- Green infrastructure/Low Impact Development

Instream Fish and Wildlife Habitat Recommendations

- Improve instream flows (i.e., floodwater detention, enhance groundwater recharge)
- Protect existing high quality components (i.e., brook trout spawning areas)
- Restore degraded stream channels, wetlands, and riparian buffer areas
- Reconnect all portions of Mason Creek to North Lake by removing aquatic organism passage barriers to restore latent ecological value to North Lake

Education and Information Recommendations

- Provide educational workshops and tours, demonstration projects, and share information on emerging crop BMPs
- Engage landowners in implementing conservation practices and provide information, technical tools, and financial support
- Promote engagement by the farming community in decision making and equip farmers with monitoring tools and methods
- Target action-oriented messages about water quality and conservation practices to key groups
- Produce and distribute newsletters, exhibits, fact sheets, and/or web content to improve communication

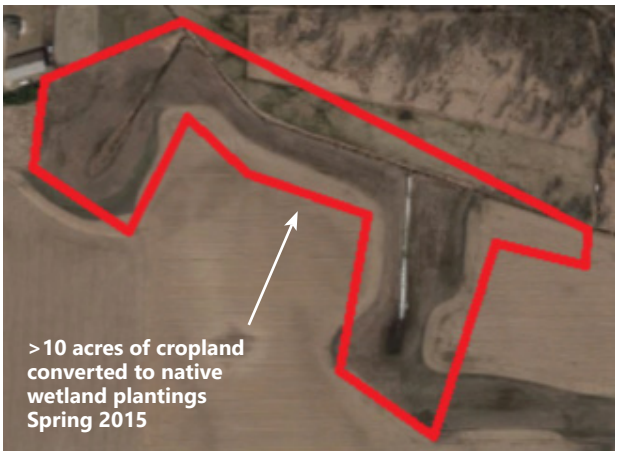
Conclusion: Mason Creek has Great Potential for Improvement

The Mason Creek watershed currently embodies significant aesthetic and ecological values and has the potential to be a more diverse and resilient aquatic and terrestrial ecosystem. The attributes that make Mason Creek and its watershed unique are the same attributes that attract residents, businesses, and supporting infrastructure to the watershed and which are necessary for a healthy local economy. Therefore, meeting the goals of the Mason Creek Watershed Protection Plan will lead to improved water quality and quantity for human needs and will help improve and preserve the hydrologic and ecological integrity of the water resources. This will also lead to a healthier and more resilient local economy.

Meeting the goals for the Mason Creek watershed will be challenging. Watershed planning and implementation is primarily a voluntary effort. The effort will need to be supported with targeted technical and financial assistance. It will require a commitment of the entire community in the Mason Creek, North Lake, and Oconomowoc River areas to improve the water quality and the condition of the watershed. The plan must be adaptable to the challenges, changes, and lessons learned by all.

Demonstration Projects – Effectively Reduce Pollutant Loads and Improve Water Quality

(Funded in Partnership by the City of Oconomowoc Wastewater Utility and the North Lake Management District)



Riparian buffer/filter strip BMPs are being installed to protect Mason Creek from excessive sediment and nutrient loads from cropland.

Streambank is being restored to prevent severe erosion within Mason Creek