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**RE: Response to request for priority concerns for the Zumbro River Watershed One Watershed, One Plan**

The Minnesota Pollution Control Agency (MPCA) appreciates the opportunity to provide input at the outset of the One Water, One Plan (1W1P) process in the Zumbro River watershed (ZRW) and Mississippi River – Lake Pepin watershed (MRLP). The MPCA has coordinated and funded many efforts in the ZRW and MRLP watersheds that will provide technical information, tools and strategies for use in 1W1P. A summary of select products is included as a preface to a listing of priority concerns. Others are summarized on MPCA's watershed web pages:

**Zumbro River:** <https://www.pca.state.mn.us/water/watersheds/zumbro-river>

**Mississippi River – Lake Pepin:** <https://www.pca.state.mn.us/water/watersheds/mississippi-river-lake-pepin>

- **Revised Regional Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota (2006).** This is a regional foundational work examining pathogens in surface waters of southeast Minnesota. <https://www.pca.state.mn.us/sites/default/files/wq-iw9-03b.pdf> Implementation plan: <https://www.pca.state.mn.us/sites/default/files/wq-iw9-02c.pdf>
- **Zumbro Turbidity TMDL Study (2012).** This study used a variety of methods to evaluate the current loading, contributions by the various pollutant sources, as well as the allowable pollutant loading capacity of 17 impaired stream reaches within ZRW. <https://www.pca.state.mn.us/sites/default/files/wq-iw9-13e.pdf>
- **Zumbro River Watershed TMDL (2017).** This TMDL study includes calculations for 1 lake with a phosphorus impairment, as well as 20 stream reaches with bacteria and/or total suspended solid (TSS) impairments located in the ZRW. <https://www.pca.state.mn.us/sites/default/files/wq-iw7-45e.pdf>
- **Geologic Controls on Groundwater and Surface Water Flow in Southeastern Minnesota and its Impact on Nitrate Concentrations in Streams (Minnesota Geological Survey, 2014).** This report summarizes the results of a Minnesota Geological Survey (MGS) investigation conducted for the Minnesota Pollution Control Agency (MPCA) designed to support watershed planning efforts in southeast Minnesota. Specifically it provides better understanding of the geologic controls on nitrate transport in the region, including nitrate in groundwater that is the source of baseflow to streams. <http://conservancy.umn.edu/handle/11299/162612>
- **ZRW Monitoring and Assessment Report (2016).** The assessment report summarizes results of intensive watershed monitoring. <https://www.pca.state.mn.us/sites/default/files/wq-ws3-07040004b.pdf>
- **ZRW Stressor Identification Report (2016).** The stressor identification report examines biota impairments in the context of probable causal factors (i.e. "stressors"). <https://www.pca.state.mn.us/sites/default/files/wq-ws5-07040004a.pdf>

- ZRW HSPF Model Development Project (2014).** Hydrologic Simulation Program Fortran is a watershed model that can simulate land/runoff processes as well as in-stream dynamics. Management scenarios for both point and nonpoint pollution sources can be constructed; simulations then output resultant predicted water quality at approximately one hundred locations in the watershed. The built and calibrated model is available for use by the 1W1P and/or any contracted consultant. The Scenario Application Manager (SAM) allows LGUs to use HSPF in a Windows/desktop environment. <https://www.pca.state.mn.us/sites/default/files/wq-iw9-20n.pdf> A technical memorandum summarizing some of the model simulations is also posted: <https://www.pca.state.mn.us/sites/default/files/wq-iw9-20o.pdf> The MPCA has other documents and memoranda related to model sensitivity analysis and other scenario simulations. Note that the HSPF model is being extended and update in spring/summer of 2019.
- ZRW Restoration and Protection Strategies Report (2017).** The Watershed Restoration and Protection Strategy (WRAPS) summarizes foundational technical information and stakeholder input to provide a starting point from which to develop tools that will help local governments, land owners, and special interest groups determine (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focus those strategies in the best places to do work. The WRAPS includes goals, timelines, pollutant source information and management strategies distilled from statewide studies/strategies such as the Minnesota Nutrient Reduction Strategy (NRS) and Nitrogen in Minnesota Surface Waters. <https://www.pca.state.mn.us/sites/default/files/wq-ws4-39a.pdf>
- MRLP Total Maximum Daily Load (2015).** The Total Maximum Daily Loads (TMDLs) in the MRLP address five streams placed on the State of Minnesota's 303(d) list of impaired waters due to documented excess Escherichia coli (E. coli) concentrations. <https://www.pca.state.mn.us/sites/default/files/wq-iw9-15e.pdf>
- MRLP Monitoring and Assessment Report (2012).** The assessment report summarizes results of intensive watershed monitoring. <https://www.pca.state.mn.us/sites/default/files/wq-ws3-07040001b.pdf>
- MRLP Stressor Identification Report (2013).** The stressor identification report examines biota impairments in the context of probable causal factors (i.e. "stressors"). <https://www.pca.state.mn.us/sites/default/files/wq-ws3-07040001d.pdf>
- MRLP Restoration and Protection Strategies Report (2015).** The Watershed Restoration and Protection Strategy (WRAPS) summarizes foundational technical information and stakeholder input to provide a starting point from which to develop tools that will help local governments, land owners, and special interest groups determine (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focus those strategies in the best places to do work. The WRAPS includes goals, timelines, pollutant source information and management strategies distilled from statewide studies/strategies such as the Minnesota Nutrient Reduction Strategy (NRS) and Nitrogen in Minnesota Surface Waters. <https://www.pca.state.mn.us/sites/default/files/wq-iw9-15n.pdf>
- Watershed Pollutant Load Monitoring Network (currently maintained website).** The Watershed Pollutant Load Monitoring Network (WPLMN) measures and compares data on pollutant loads from Minnesota's rivers and streams and tracks water quality trends. A new data viewer allows for interactive examination and retrieval of load data, including sites in the CRW. <https://www.pca.state.mn.us/water/watershed-pollutant-load-monitoring-network>
- Point source phosphorus mapping tool (currently maintained website).** This tool provides via interactive map interface summaries of annual phosphorus loads and flow volumes discharged

from wastewater facilities since 2005. <https://www.pca.state.mn.us/water/phosphorus-loads-and-flow-volumes>

According to the findings of these and other works, MPCA lists the following priority concerns for consideration in the 1W1P process:

- **Nitrate-nitrogen reduction.** Nitrate contamination of surface and groundwater is a long-standing issue in southeastern Minnesota. Most county water plans rank this as a top priority concern. Minnesota's NRS documented an approximate 0% change in the nitrogen load leaving our state since the 1990s. In the karst region many springs show increasing nitrate concentration trends. "Moving the needle" on nitrates will be a challenge going forward; one that should be addressed in the Zumbro 1W1P. Each respective WRAPS draws on various citations to describe sources (cultivated acres are dominant source), transport (nearly all nitrogen in the ZRW and MRLP is loaded to surface waters via vertical leaching loss) and the best strategies for nitrate reduction (source control and vegetative scouring). They also provide stakeholder-derived example combinations of BMPs that (per best estimates) would result in a 20% reduction of the nitrogen load leaving the watershed. Nitrogen BMPs need broad application in our state and in the ZRW & MRLP. Because prioritization for nitrogen work in southeast Minnesota cannot be sufficiently accomplished via runoff-based GIS models, the 1W1P could consider a "layering" approach to prioritization: focus on areas that show high nitrate loading (per model), have drinking water issues (per MDH and/or private well analysis) and show biota stressed by nitrate (per stressor identification). The 1W1P should also work to temper expectations regarding nitrate water quality changes in trout streams, given the lag-time in delivery from land through groundwater to surface waters (see MGS report listed above).
- **Improve and protect the watershed's lakes.** The Zumbro 1W1P area has one natural lake and several reservoirs; most prominent being Lake Zumbro and Rice Lake. Eutrophication of Rice Lake, managed for waterfowl, is largely determined by internal nutrient cycling; detailed analysis, management strategies and costs for management of Rice Lake were discussed with DNR and included in the Zumbro TMDLs and WRAPS documents. The MPCA developed site specific water quality goals for Lake Zumbro because it is a reservoir that drains a large area and multiple ecoregions. In developing the ZRW WRAPS, stakeholders identified Lake Zumbro as a local priority. Generally, local partners and landowners need to make a long-term commitment to reduce phosphorus and sediment going to the lake in order to improve water quality and prevent the upper part from filling in. Lake Zumbro is currently meeting its water quality goals (during many of the "average condition" summer months) but work upstream to reduce phosphorus loading to the reservoir will help prevent excessive algal growth; cities upstream should grow and develop in a way that will be protective of Lake Zumbro water quality.
- **Further study and address habitat issues in streams.** Degraded and/or insufficient stream habitat is a prevalent stressor of biota (i.e. "fish and bugs") in southeast Minnesota and in the ZRW & MRLP. The 1W1P should consider the best strategies for addressing habitat issues in various settings and at various scales. State monies are supporting natural channel design projects (Cascade Creek project in the Zumbro watershed) and trout habitat improvement; some SWCDs are implementing low-cost projects that change channel geometry and seed banks with perennials. A thoughtful and technically supported approach to optimally applying these various habitat improvement methods would be a good outcome for 1W1P.
- **Protection of baseflow especially in coldwater Trout Streams.** The distinctive landscape of the Driftless Area is characterized by craggy limestone, sandstone valleys, and steep hillsides. This ancient terrain, which was bypassed by the most recent glaciation, is characterized by one of the

highest concentrations of limestone spring creeks in the world. The spring water emerging from limestone bedrock provides a near constant flow of cold water. The limestone enriches the water with essential minerals for aquatic insects and other creatures, which contributes to prime conditions for healthy populations of trout and other coldwater dependent species. More than 600 spring creeks (exceeding 4,000 river miles) cross this 24,000 square-mile landscape. Trout anglers produce an economic benefit to the Driftless Area in excess of \$1.1 billion every year (Northstar Economics & Trout Unlimited 2008). Nearly all of the designated trout waters in the ZRW meet the criteria for the southeast Minnesota coldwater F-IBI. A focus of protection work should be preserving the baseflow of streams via focused monitoring and careful consideration of future water appropriations. Education on groundwater appropriation permit coverage for withdrawal and implementing additional observation wells for tracking quantity would aid in achieving this priority. The plan should underscore the importance of technical review of appropriations permits, including baseflow stream depletion analysis.

- **Increase perennial land acreage.** More living cover on the land reduces pollutant loads and provides wildlife habitat. This is a multiple-benefits “parent” strategy from which various specific strategies could be shaped. Examples in the WRAPS document include:
  - Keep existing pastures and rangeland; look for opportunities to convert marginal row; crop acres. Pasture is a working-lands BMP that is an integral part of local economies;
  - Encourage re-enrollment of expiring CRP contracts;
  - Manage forest acres with stewardship planning;

The NRS and numerous other technical documents cite the multiple benefits of perennials. The 1W1P should provide a foundation for efforts going forward to increase perennial acres in the watershed.

- **Continue work to reduce pathogens in surface waters.** The presence of fecal pathogens in surface water is a regional problem in southeast Minnesota. The issue was well-described in a stakeholder driven process that culminated in approval of 39 approved fecal coliform TMDLs for streams and rivers in the region. The Revised Regional *Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota* was approved in 2006. Subsequent to TMDL approval, stakeholders completed an implementation plan. According to the findings and strategies summarized in these documents, numerous projects have been executed in efforts to reduce pathogen loading to the region’s surface waters. Feedlot runoff, unsewered communities and over-grazed pastures (among others) have all been addressed via grant funding. The E. coli TMDLs in the ZRW and MRLP should be considered (for planning purposes) an addendum to the regional TMDL work and 1W1P should support continued work to better understand E. coli indicator presence (see TMDLs document for research needs) and reduce pathogen loading to surface waters.

Sediment (and associated turbidity) is a pollutant of concern and a prevalent stressor of aquatic life in the ZRW and MRLP. It is implicitly addressed by the priority concerns listed above in that focusing on pollutant and pathogen load reductions and stream habitat issues will result in corresponding sediment load reductions.

MPCA is committed to providing assistance in interpreting and applying the substance of the WRAPS, NRS, HSPF model, SID conclusions, etc. going forward as these and other priority concerns are installed and addressed in the 1W1P framework. Thank you again for the opportunity to provide input and for your on-going work in the Zumbro River and Mississippi River – Lake Pepin watersheds.

Sincerely,

A handwritten signature in black ink, appearing to read "Emily Bartusek". The signature is fluid and cursive, with a long horizontal stroke at the end.

Emily Bartusek  
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