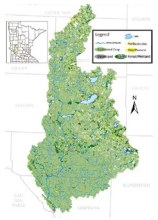
Summary

Chippewa River

Watershed Restoration and Protection Strategies (WRAPS) Report Summary



Minnesota has adopted a 'watershed approach" to address the state's 80 "major" watersheds (denoted by 8-digit hydrologic unit code or HUC). This approach looks at the drainage area as a whole instead of focusing on lakes and stream sections one at a time, thus increasing effectiveness and efficiency. This watershed approach incorporates the following activities into a 10-year cycle:

- Water quality monitoring and assessment
- Watershed analysis
- Civic engagement
- Planning
- Implementation
- Measurement of results

Photo by Chippewa River Watershed Project staff showing the Chippewa East Branch at Swift Falls Park.

The Chippewa River Watershed process began in 2009. It was the first time watershed assessments incorporated biology (fish and macroinvertebrates) along with the traditional chemistry and flow, for a comprehensive watershed health assessment. The watershed approach adds a protection component for water resources meeting standards rather than focusing entirely on restoration of impaired waters.

Watershed characteristics

- Size: 1.3 million acres.
- Counties: Chippewa, Swift, Pope, Douglas, Kandiyohi, Grant, Stevens and Otter Tail.
- Ecoregion(s): Western Corn Belt Plains (WCBP) North Central Hardwood Forest (NCHF) & Northern Glaciated Plains (NGP).
- Land use: Predominantly agriculture.
- Population: Approximately 42,000 (including 32 rural towns).
- Land use in the Chippewa River Watershed
- The 8-digit hydrologic unit code or HUC for the Chippewa River Watershed is 07020005.
- The Chippewa River Watershed has more lakes than any other tributary watershed in the Minnesota River Basin.

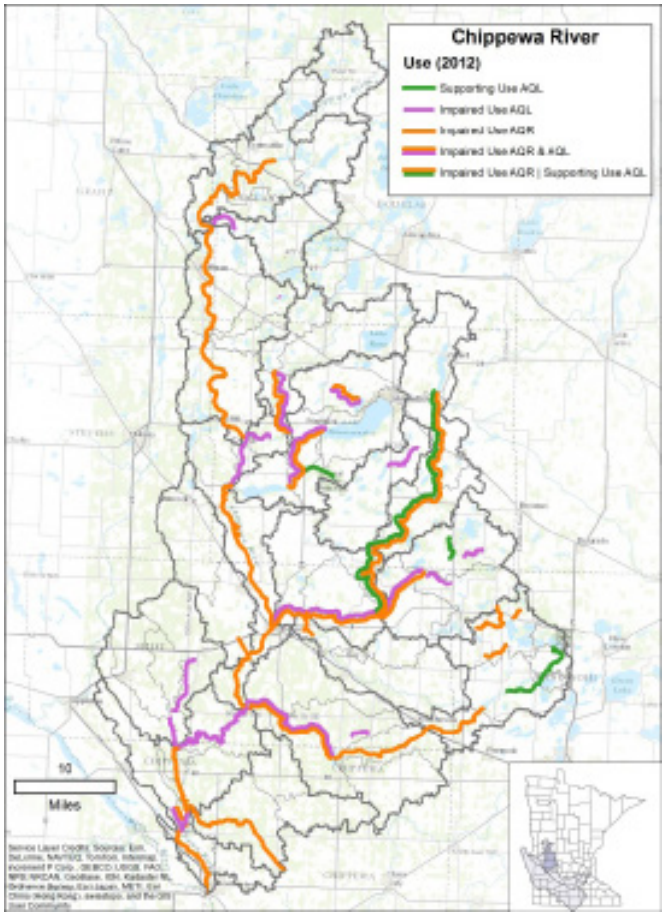
Assessments: Are waters meeting standards and providing beneficial uses?

During the first phase of the watershed approach – intensive watershed monitoring – the MPCA and local partners collect data about biology such as fish populations, chemistry such as pollutant levels, and flow to determine if lakes and streams are meeting water quality standards.

Waters are "impaired" if they fail to meet standards. The maps shown below indicate the impairments for streams and lakes in the Chippewa River Watershed. Under federal and state laws, impaired waters must have Total Maximum Daily Load (TMDL) studies to determine reductions of pollutants needed to again meet water quality standards. In this first WRAPS cycle, the MPCA and local partners completed TMDL studies for seven lakes and 16 stream reaches.

The identified pollutants in the Chippewa are: sediment, phosphorus, nitrogen, bacteria and low dissolved oxygen. The identified stressors in the Chippewa are altered hydrology and poor habitat. The maps below show the stream reaches and lakes found to be impaired or supporting the water quality standards. Note that only a fraction of the total water bodies was tested or assessed. This does not imply that pollutants/stressors are only problematic where identified as impaired. Rather, the high percent of tested waters that were found to have problems indicates that the pollutant/stressor is likely common across the watershed.

Impairments in the Chippewa River Watershed



What factors are affecting fish and/or bugs? Pollutants and stressors:

To develop strategies for restoring or protecting water bodies with biological impairments, agencies and local partners must first identify the possible causes, or stressors, of the impairments. The table below summarizes the predominant stressors in the Chippewa River Watershed.

Stream	Reach Description	AUID # 07020005- ___ ___ ___	Low Dissolved Oxygen	High Phosphorus	High Nitrates	High Turb./TSS	Altered Hydrology	Poor Habitat	Loss of Connectivity (dams, perched culverts)
Chippewa River	Stowe Lk to Little Chippewa R	503	X	X		X	X	X	
Ouam and Venus Lake Drainage	Unnamed lk to Unnamed lk	638		X		X	X		X
Little Chippewa River	Unnamed cr to CD 2	713	X	X		X		X	
Outlet Creek	Lk Minnewaska to Lk Emily	523		X		X	X		
Trappers Run	Strandness Lk to Pelican Lk	628	X	X			X	X	X
Mud Creek	T123 R36W S28, east line to T123 R36W S29, west line	551	X						
Mud Creek	CD 15 to E Br Chippewa R	554	X					X	X
County Ditch 15	Headwaters to Lk Ben	623	X	X					X
Disconnected downstream section of the Little Chippewa	Unnamed wetland (61-0527-00) to Chippewa R	714	X	X			X		X
Chippewa River	Unnamed cr to E Br Chippewa R	505	X	X		X	X	X	
Shakopee Creek	Shakopee Lk to Chippewa R	559		X	X	X	X	X	X
Cottonwood Creek	Unnamed cr to Unnamed ditch	546					X	X	
Chippewa River	Dry Weather Cr to Watson Sag	502	X	X		X	X	X	X
Chippewa River	Shakopee Cr to Cottonwood Cr	507		X		X	X	X	
Chippewa River	Cottonwood Cr to Dry Weather Cr	508		X		X	X		
Lines Creek	Unnamed cr to Chippewa R	584	X	X					

Restoration and protection strategies

The full WRAPS report contains two tables summarizing the strategies (link to this report is located near the end of this summary). Table 17, 18 and 19 summarize the pollutants and stressors, the WRAPS report documents their sources and source contributions, and presents a narrative of the estimated changes necessary for all waters to meet the (long term) water quality goals. Table 10 summarizes the selected strategies to meet the 10-year water quality targets, the estimated effectiveness of the selected strategies on the identified pollutants and stressors, and the responsible parties for making these changes. This table is most useful for immediate planning and other local needs, since local plan are typically re-done every 10 years. With the next version of the watershed approach, progress towards these targets can be assessed and new targets for the following decade can be created. The presented strategies need to be implemented across the watershed at varying adoption rates due to regional differences in water quality conditions, pollutant and stressor sources, and in accordance with community priorities.

Taken as a whole, the strategies state that to meet the water quality improvement goals in the Chippewa River watershed, partners should work to fully implement the buffer rule, convert marginal cropland to perennial cover, expand application of cover crops and improve source control of nitrogen fertilizer.

Next steps and measuring results

The restoration and protection strategies listed in the WRAPS report will be the basis for developing local implementation plans to restore and protect water resources. The report lays out goals, milestones and responsible entities to address protection and restoration priorities in the Chippewa River watershed. The targets are intended to provide guidance and "measuring sticks" to assess the watershed's health and success of actions taken.

Water quality in Minnesota has declined over many decades. While restoration activities continue, new problems develop, such as converting land to intensive cropping that negatively impacts water quality. The perpetual challenge is to make improvements and keep up with new problems. Impacts from other factors such as climate change are still not completely understood. Consequently, it may take decades to fully restore impaired waters.

Key conclusions of first cycle

- Land uses that lack of vegetation and or create impervious conditions correlate to increased runoff and reduced water quality. Areas with high concentrations of cultivated crops, industry, people, or animals tend to have water quality issues when impacts are not optimally managed.

- Cultivated land, in the Shakopee Creek and Dry Weather Creek sub-watersheds, is the source for the vast majority of the nitrogen load in the Chippewa River Watershed. With less than 20% of the nitrogen load leaving the land areas via runoff; the dominant transport mechanism is leaching loss to tiles or groundwater and management should be applied accordingly. The nitrogen load can be reduced by improving nutrient use efficiency and control and treatment of excess nitrogen via drainage management and adding living cover such as perennials and cover crops.

- Sediment and Total Suspended Solids (TSS) issues are widespread throughout the watershed. Overall in the Chippewa River Watershed 38% of the TSS load is derived streambank erosion, 20% is from Volatile Suspended Solids (algae, diatoms, decaying plant matter, etc) 20% is from upland surface erosion, 17% from ravine and gully erosion and 5% from developed sources. While these are the overall percentages for the entire watershed, in individual sub-watersheds the sources can vary drastically based on a number of factors: Amount of cattle operations with uncontrolled access to the river or streams; amount of stream banks that have inadequate buffers; amount that the hydrology has been altered; and if the stream or river flows directly through a highly eutrophic lake such as Lake Emily or Shakopee Lake.

- Point source phosphorus loads are important during low flow years and point source permits should reflect the wasteload allocations in the Chippewa River Watershed Total Maximum Daily Loads Report. However, overall only 6% of the phosphorus load is associated with point source and unsewered areas, and failing septic systems account for additional 4%. Eighty-one percent of the phosphorus source is related to agriculture (35% crop surface runoff, 31% crop tile water and 15% crop groundwater) with the vast majority of the phosphorus loading occurring during spring snow melt as a result of fall application of fertilizer and winter application of manure.

- The next WRAPS project cycle for the Chippewa River is expected to begin in 2019.

- The high fecal coliform and e-coli levels are not geographically distinct; rather they are the result of prevalent issues relating to pathways. Continuous livestock access to the river through pastures along waterways is a pathway. Manure applied to cultivated fields is another pathway. These are exasperated by inadequate buffers on many of the tributary streams and ditches. Additionally, ineffective septic systems are another known pathway.

Typical small tributary ditch to the Chippewa River in the Western Corn Belt Plains Ecoregion.

Contacts

- Chippewa River Watershed Project: Kylene Olson, Executive Director; kylene@chippewariver.org ; 320-321-1717
- MPCA: Paul Wymar, project manager; paul.wymar@state.mn.us ; 507-476-4282
- www.pca.state.mn.us and search for "Chippewa River."

Full report

Full report at https://www.pca.state.mn.us/sites/default/files/wq-ws4-13a.pdf or go to www.pca.state.mn.us and search for "Minnesota River – Chippewa River."

CLEAN WATER LAND & LEGACY AMENDMENT

The Clean Water, Land and Legacy Amendment is funding a large part of the MPCA's watershed approach.