

Leech Lake 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

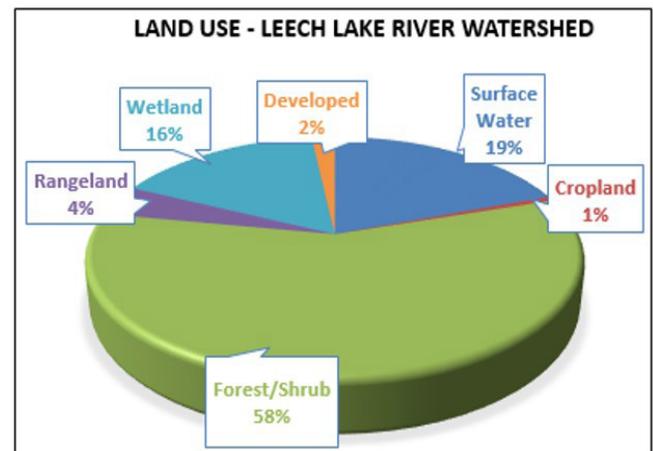


Boy River, MPCA photo

The Leech Lake River watershed process began in 2012. The 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 that currently meet standards rather than focusing entirely on restoration of impaired waters.

Watershed characteristics

- Size: 1335 square miles or 854,659 acres.
- Water: ~Over 750 lakes >10 acres and 277 perennial river miles.
- Counties: Beltrami, Cass, and Hubbard.
- Ecoregion: Northern Lakes and Forests
- Land use: Predominantly forested, with only about 2% developed.
- Municipalities in the watershed include Boy River, Federal Dam, Laporte, Longville, Hackensack and Walker.
- The 8-digit hydrologic Unit Code (HUC) for the Leech Lake River Watershed is 07010102.

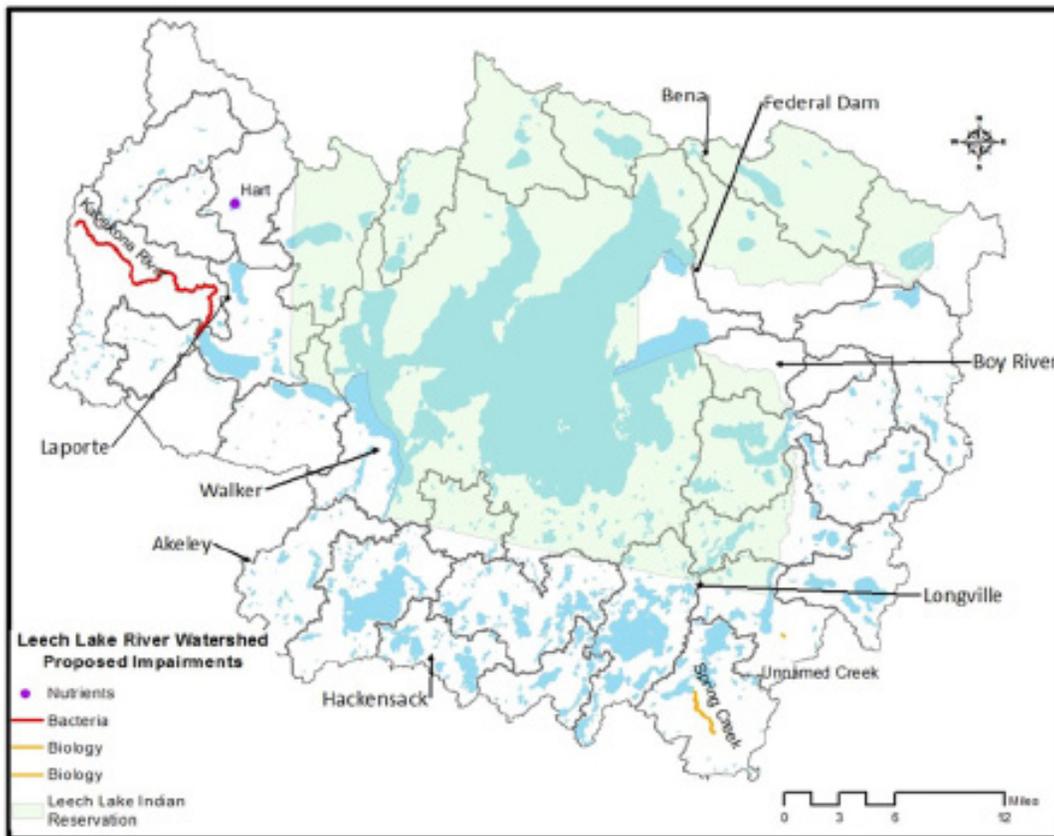


Assessments: Are waters meeting standards and providing beneficial uses?

During the first phase of the watershed approach – intensive watershed monitoring – the Minnesota Pollution Control Agency 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 map below shows the impairments for streams and lakes in the Leech Lake River Watershed. Of the numerous surface water resources assessed in the 2016 assessment cycle for this watershed, only two surface water resources (Hart Lake and the Kabekona River – Hubbard County) were added to the 2016 Minnesota Impaired Waters List under the U.S. Environmental Protection Agency category 5 classification. Information gathered from the WRAPS Technical Team and the Professional Judgement Group (PJG), suggested that developing a Total Maximum Daily Load (TMDL) for the current impairments should be deferred and pursued if they are not delisted or re-categorized in the next Intensive Watershed Monitoring (IWM) cycle. The next IWM cycle is currently scheduled to start in 2022.

Impairments in the Leech Lake River Watershed



Impairments:

- **Lakes** (Hart Lake – Hubbard County) was found to be impaired for nutrients in the Leech lake River Watershed.
 - **Streams** (Kabekona River- Hubbard County) was found to be impaired for bacteria (*E. coli*).
- See Section 2.4 (TMDL Summary) of the Leech Lake River WRAPS report for additional information on these impairments. Located: <https://www.pca.state.mn.us/sites/default/files/wq-ws4-31a.pdf>

Stressors: What factors are affecting fish and bugs?

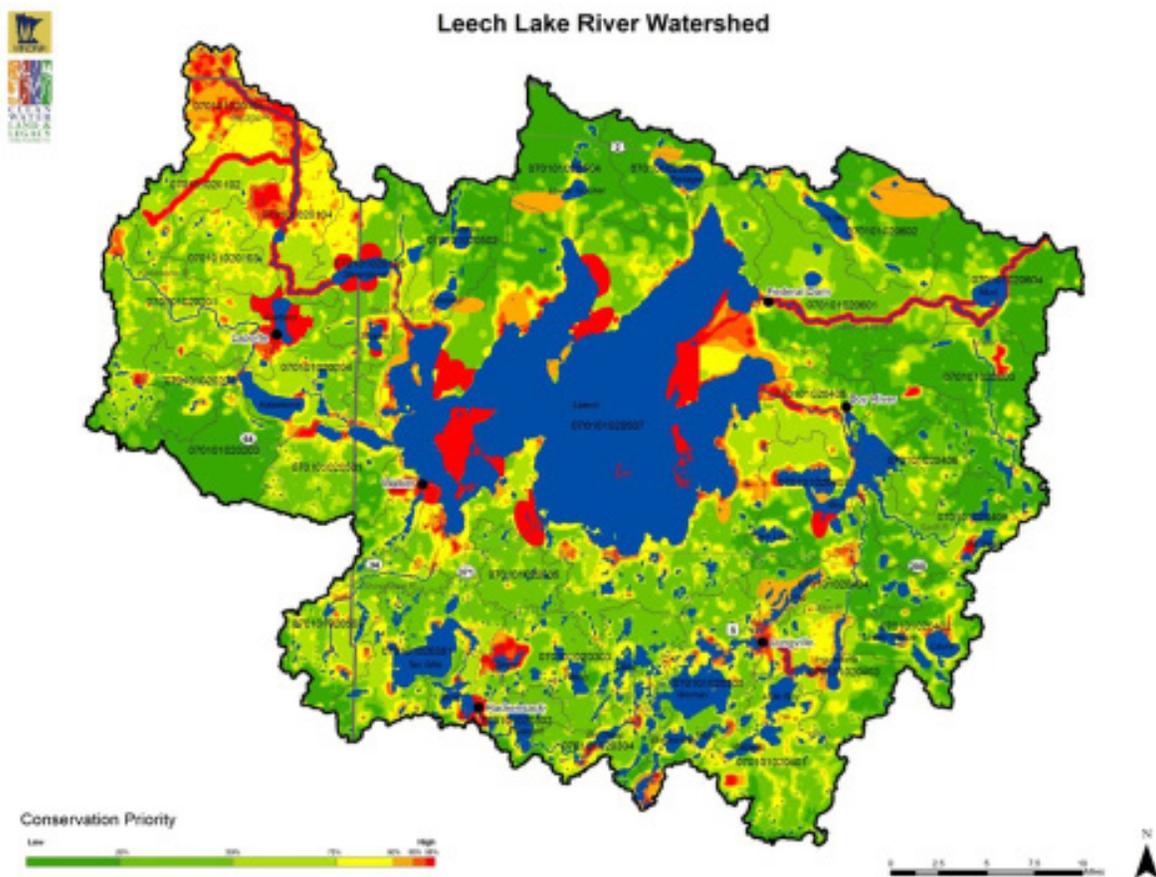
To develop strategies for restoring or protecting water bodies with biological impairments, agencies and local partners must first identify the possible causes, or stressors, of the impairments. The table below summarizes the predominant stressors in the indicated streams in the Leech Lake River Watershed.

HUC 12 Watershed	Stream Name	AUID #	Dissolved Oxygen	Phosphorus	Sediment/Turbidity	Connectivity	Altered Hydrology	Channel Alteration
070101020401 Little Boy Lake	Spring Creek	07010102-610	X					
070101020403 Ingwadona Lk - Boy R	Unnamed Creek	07010102-612	X					

Restoration and protection strategies

The WRAPS project team (Team) created the strategy map (Map output from the Zonation Model) below using HUC-12 subwatersheds – drainage areas within the larger HUC-8 Leech Lake River Watershed – to help identify priority areas for targeting actions to protect water quality. Multiple sources of data, maps and analysis tools including Hydrologic Simulation Program Fortran (HSPF) were combined to create this map. Areas shown in red and orange were designated as areas with the highest conservation potential. The Team reviewed the maps for each of the 26 conservation features that comprised the model to determine what conservation features aggregated together in the final model for a high priority designation.

Other maps of individual pollutants, such as phosphorus and nitrogen, can be found in the full report.



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 Leech Lake 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 some areas 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. For these reasons, it is much more cost-effective to protect clean waters while we can, such as those in the Leech Lake River Watershed.

Key conclusions of first cycle

- The LLR Watershed is situated in the heart of Minnesota’s premier lake country and contains some of the most pristine natural resources in Minnesota. The forests and surface waters of the watershed support a very high degree of biodiversity.
- The Leech Lake River Watershed overall has very good water quality and to preserve it, forest protection is critical. The watershed is heavily forested (58%) and among the top producers of clean water in the U.S.
- The WRAPS report data and findings provide a base for developing the One Watershed One Plan.
- Forty-five lakes and/or basins were evaluated for water quality trends based on long-term transparency monitoring. Results suggest the following: 25 (no trend), 13 (improving) and 7 (declining).
- The primary goal in this watershed is to maintain the current water quality status and improve where possible. A 5% reduction goal is achievable for many of the priority lakes and provides an incentive for citizen engagement in achieving those goals.
- A watershed model was used to link land use changes to watershed responses in water quality, hydrology, hydrogeology and natural features.
- Land conservation practices, such as conservation easements on threatened parcels (e.g. School Trust Fund lands and other sensitive areas) and managing forest health are priority protection strategies.
- The next IWM/WRAPS project cycle for the Leech Lake River Watershed is expected to begin in 2022.



**Great Blue Heron. Photo courtesy
Leech Lake Area Watershed Foundation**

Full report

Full report as well as supporting documents can be found at:

<https://www.pca.state.mn.us/water/watersheds/leech-lake-river>

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