Summary

Stressor Identification

Leech Lake River Watershed

Why is it important?

The Leech Lake River watershed covers about 1,335 square miles in the northern part of the Upper Mississippi River Basin. The watershed includes parts of Beltrami, Cass, and Hubbard counties. Major communities in the watershed are Laporte, Benedict, Walker, Federal Dam, Boy River, Whipholt, Longville, and Hackensack. The watershed also includes the Leech Lake Reservation (Leech Lake Band of Ojibwe). The Leech Lake River watershed has 277 total river miles and contains over 750 lakes with a total acreage of 166,374.

The watershed is located in Minnesota's Northern Lakes and Forest ecoregion. It is largely forested, with about 46% of the land privately held, with the remaining portion of land state, county or federal public land, or held by tribal land owners.

Key issues

Based on intensive watershed monitoring, which began in 2012, results overall show that most surface waters meet Minnesota's standards for conventional pollutants. But these resources face increased pressure from development and subsequent loss of shoreline and aquatic habitat. Threats to the watershed are:

- **Shoreline and aquatic habitat loss due to development**
- **Projected population growth of about 60% by 2030**
- **Increased nutrient, contaminant, sediment loading from stormwater runoff**
- **Loss of biodiversity due to competition from invasive species**

Highlights of report

- The report summarizes the key causes, or "stressors", contributing to impaired fish and aquatic macroinvertebrate communities in this watershed. A comprehensive review of existing biological, chemical, and physical data was performed to create a broad list of candidate causes for impairments. Water bodies with identified impairments include the Necktie River and its tributaries, Spring Creek, and an unnamed creek that is a tributary to Northby Creek.
- The Leech Lake River watershed is a "healthy" watershed, maybe the healthiest in the Upper Mississippi River Basin. This is partly because most of the very few impairments are the result of natural background conditions. Also, the high amount of forested land plays a role in perserving water quality throughout the watershed. Identified causes of impairments include low dissolved oxygen, excess sediment, altered hydrology and geomorphology, habitat loss, connectivity loss, and elevated phosphorus.
- For Spring Creek and Unnamed Creek, a natural background review committee determined that low dissolved oxygen concentrations (and subsequent poor fish communities) are due to natural causes. In these creeks, the natural cause is enhanced wetlands due to high numbers of upstream beaver dams. The dams are also likely acting as migration barriers for fish.
- Fish communities in the lower Necktie River are also influenced, or limited, by low dissolved oxygen levels. This impairment in the Necktie River is currently

Highlights
continued

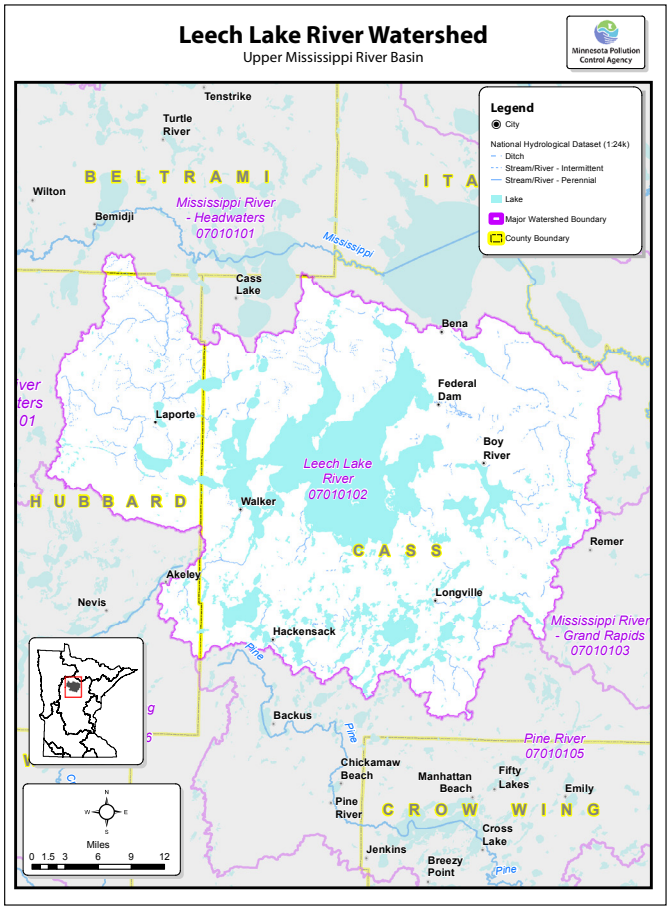
being deferred until special dissolved oxygen standards are determined for north central, and northeastern Minnesota.

- The projected 60% population increase by 2030 makes protection strategies just as important as restoration strategies throughout the watershed. Population increases can mean more development that can increase amounts of impervious surfaces, and decrease natural shorelines and existing habitat surrounding surface waters. Increases in impervious surfaces (pavement, roof surface, etc.) can alter natural water flows and add sediment and pollutants to stormwater runoff.

About this study

Monitoring of many of the lakes and streams began in 2012, as part of the MPCA's intensive watershed monitoring effort. Those results can be found in the Leech Lake River Watershed Monitoring and Assessment report, which is the first step of the watershed restoration and protection strategy (WRAPS) process, and is available on the MPCA website.

This report, the second WRAPS step, or stressor identification, is to find and evaluate factors, natural and human, which are likely responsible for the impaired condition of the fish and macroinvertebrate communities. An important part of stressor identification is to understand the natural features and processes occurring in the watershed, and gaining understanding of the extent of various human activity throughout the watershed that may have potential to degrade streams, rivers, and lakes.



Full report

To view the full report, go to https://www.pca.state.mn.us/water/watersheds/leech-lake-river#overview

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