Minnesota Pollution Control Agency

W. Fork Des Moines River, Heron Lake TMDL Project for Bacteria, Turbidity

Water Quality/Impaired Waters #7.13a • July 2008

It is estimated that the overall magnitude of reduction needed to meet water quality standards ranges from 10 to 86 percent for fecal coliform bacteria, 50 to 80 percent for turbidity levels, and 87 percent for North and South Heron Lake excess nutrients.

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The list of impaired waters developed by the Minnesota Pollution Control Agency includes several reaches, or segments, of the West Fork Des Moines River (WFDMR), and Heron Lake in southwestern Minnesota that fail to meet the standard for human contact due to excessive amounts of fecal coliform bacteria, and also the water quality standard for turbidity.

Turbidity is a measure of cloudiness of water that affects aquatic life. In addition, North and South Heron Lakes are impaired by excess phosphorus, which results in an overabundance of algae growth, and acidity levels in the Heron Lake outlet.

The water quality standard for fecal coliform bacteria is an average of 200 colony forming units (CFU) per 100 milliliters (ml) of water. Above this level there is greater risk of disease caused by bacteria. This causes the water to be less suitable for swimming.

The MPCA has prepared a Total Maximum Daily Load (TMDL) report documenting the impairments. A TMDL study calculates the maximum amount of a pollutant a water body can receive (known as the "loading capacity") without violating water quality standards. The TMDL process identifies all sources of pollutants causing impairments and allocates limits necessary to meet the water quality standard.

Watershed Description

The WFDMR watershed is located in southwestern Minnesota and is a part of the Western Corn Belt Plains and Northern Glaciated Plains ecoregions. The watershed extends across seven counties: Murray, Cottonwood, Jackson, and Nobles and a small portion of Pipestone, Lyon, and Martin. It covers an area of 1,333 square miles. The subwatershed contributing to North and South Heron Lake is 467 square miles.

The river originates in the northwestern part of the watershed from several lakes including its principal source Lake Shetek. The river flows from the Lake Shetek outlet near Currie in a southeasterly direction for 94 miles to the Minnesota/Iowa border and eventually enters the Mississippi River at Keokuk, Iowa.

Land use is dominated by agricultural cropping and animal production. Point sources (permitted municipal and industrial

dischargers) and a small number of unsewered communities also exist in the watershed.

Pollution Sources

The primary contributing sources to fecal coliform bacteria were found to be livestock on overgrazed riparian pasture, surface-applied manure on cropland, feedlots lacking adequate runoff controls and inadequate septic systems. The primary contributing sources to the turbidity impairments were found to be streambank/bed erosion, row cropland, algae and, to a lesser extent, benthic feeders (e.g., carp), overgrazed pasture and inadequate buffers near streams and waterways.

The primary contributing watershed sources to excess phosphorus in North and South Heron Lake were essentially found to be divided between point sources, primarily wastewater treatment facilities, and nonpoint sources, including cropland/pasture runoff and streambank erosion. Under current conditions, internal phosphorus loading to North and South Heron Lake from sediment phosphorus release, wind resuspension, and benthic fish represent a larger source of phosphorus (more than 75 percent overall) than the watershed loading to the lakes.

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Restoring the waters

A general strategy for implementation of nonpoint source-related actions to address the impairments is provided in the TMDL report. However, a more specific implementation plan will be developed and will be available as a separate report. Nonpoint contributions are not regulated and, therefore, reductions will need to proceed on a voluntary basis.

Stakeholder involvement, education and outreach, and evaluation of best management practice options are key components of all TMDL implementation plans. Needed reductions from permitted point sources related to the North and South Heron Lake TMDL are described in the TMDL report. These will be addressed through the MPCA's National Pollutant Discharge Elimination System (NPDES) permit programs.

South Heron Lake

For more information

For more information on the WFDMR TMDL project:

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The draft TMDL report will be available on the Web at: www.pca.state.mn.us/water/tmdl/index.html#drafttmdl. General information on TMDLs can be found on the Web at: www.pca.state.mn.us/water/tmdl/ and www.epa.gov/owow/tmdl/