



Minnesota
Pollution
Control
Agency

Pomme de Terre River Fecal Coliform Bacteria Total Maximum Daily Load Project

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A segment of the Pomme de Terre River in western Minnesota was listed in 1994 by the Minnesota Pollution Control Agency as failing to meet the standard for human contact due to excessive amounts of fecal coliform bacteria. The MPCA has prepared a Total Maximum Daily Load (TMDL) report documenting the impairment.

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 reductions necessary to meet the water quality standard.

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 human contact such as swimming. Monitoring data show that the lower portion of the Pomme de Terre River from Muddy Creek to Marsh Lake is impaired for fecal coliform bacteria.

Watershed Description

The Pomme de Terre River Watershed is located in the upper Minnesota River Basin. It covers nearly 560,000 acres or about 875 square miles. It originates in southern Otter Tail County and flows about 106 miles south, discharging into Marsh Lake on the Minnesota River. Land-use is dominated by agricultural cropping and animal production. Beef and swine



production represent nearly half of the approximately 64,000 animal units in the watershed.

The total human population in the watershed is estimated to be about 18,400. Nearly 9,700 are urban and 8,700 are rural. The urban population is served by centralized sewage treatment. It is estimated that 50 percent of the rural households have out-of-compliance septic systems. Of these, 25 percent, or 435 households, have septic systems that directly discharge to tile.

Monitoring and Assessment

The Pomme de Terre Watershed has been studied since May 1964 when it was included in the West Central Minnesota Resource Conservation and Development Area (currently WesMin RC & D) plan. In 1981 the Pomme de Terre River Association was organized with a joint powers board of six counties and Soil and Water Conservation Districts in the watershed. The Association and WesMin RC & D have ongoing monitoring efforts in the watershed, results from which are used throughout this report.

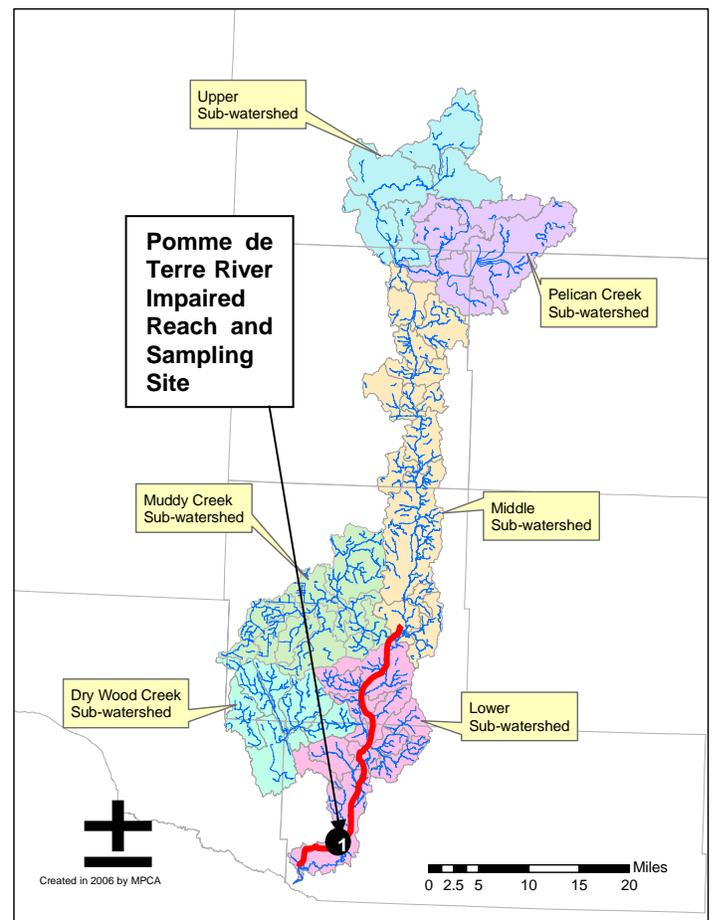
The report used a flow duration curve approach to determine the fecal coliform loading capacity at the impaired reach under varying flow levels. It focuses on fecal coliform loading capacity and general allocations necessary to meet water quality standards at the impaired reach, rather than on precise loading reductions that may be required from specific sources. Fecal coliform loading capacities were calculated for the impaired reach, and those capacities are allocated among point sources (wasteload allocation), nonpoint sources (load allocation), and a margin of safety. A loading capacity is the product of stream flow at the impaired reach and the fecal coliform water quality standard.

The assessment of fecal coliform sources within a watershed and establishing the cause-effect relationship between the sources, the transport mechanisms, and the subsequent stream loading is complex and difficult to quantify. The survival rate of fecal coliform on land and in water is poorly understood and further exacerbates efforts to track sources. Data show a strong positive correlation between rainfall and fecal coliform bacteria concentrations. When storms occur, weather-driven sources, e.g. feedlot runoff, overgrazed pasture runoff, manure-applied fields, and urban stormwater overshadow continuous sources. In drought or low-flow conditions continuous sources, e.g. cattle in streams, failing individual sewage treatment systems, unsewered communities, and wastewater treatment facilities dominate. Natural background loads for fecal coliform bacteria can be attributed to wildlife (primarily deer and geese).

Implementation

A watershed-wide approach plans to achieve water quality standards for fecal coliform bacteria within ten years. The final implementation plan will be developed within a year of the final approval of the report by the EPA. The implementation plan will spell out what and where Best Management Practices (BMP) will be applied in the sub-watersheds, and identifies the cost and funding sources for their application.

The following pollution reduction practices by land owners and local resource managers can help reduce pathogen transport and survival: Feedlot runoff controls, effective subsurface sewage treatment systems, municipal wastewater disinfection, proper land application of manure, erosion control, rotational grazing, and urban stormwater management.



Further monitoring sites may be added upon the implementation of the BMPs. Implementation activities at the sub-watershed level will be re-evaluated after monitoring and BMPs can be modified as needed. Annual results will be included in the yearly Pomme de Terre River Watershed Monitoring Summary. A technical work group will monitor and evaluate the implementation strategies, and will advise and make recommendations on the progress of the strategies to the PdT Joint Powers Board.

For more information

For more information on the Pomme de Terre River fecal coliform bacteria TMDL project, contact Muriel Runholt, MPCA-Marshall, 507-537-7137; or Marilyn Bayerl, Bayerl Water Resources, 320-283-6127. 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/