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# **Lake Conservation Notes**

Northeast Glacial Lakes Watershed Project  
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## Surface Water Pollution from Livestock Production

The improper management of livestock wastes (manure) can cause surface and groundwater pollution. Water pollution from animal production systems can be by direct discharge, runoff, and/or seepage of pollutants to surface or ground water.

Pollutants are sediment, nutrients, pesticides, organic matter, salts, and micro-organisms.

Polluted surface water can kill fish, cause odors, spread infectious bacteria, and inhibit water-related activities.

### **The main livestock pollutants in surface water:**

- Organic matter and excess nutrients
- Pathogen contamination

### **Organic matter and excess nutrients**

Livestock manure used properly can improve soil fertility and tilth, increase the soil's water holding capacity, and reduce wind and water erosion. However, surface and groundwater pollution can occur if manure applications are mismanaged.

Livestock waste contains nutrient and organic material. Aquatic life relies on the breakdown of organic material for primary and secondary sources of food.

There is a limit, however, to the amount of organic material acceptable in the aquatic environment. Too much organic material produces highly colored, murky water with heavy bottom sludge accumulation. Excess nutrients (especially phosphorous and nitrogen) carried by organic matter may produce overabundant algae and weed growth in surface water. Toxic blue-green algae blooms may even appear when the conditions are right.

The oxidation of the organic material may cause such a reduction in dissolved oxygen that fish and other aquatic life are unable to survive.

Possible sources of animal waste in surface water include feedlot runoff, manure land runoff, direct animal deposit, and septic systems.

### **Pathogen contamination**

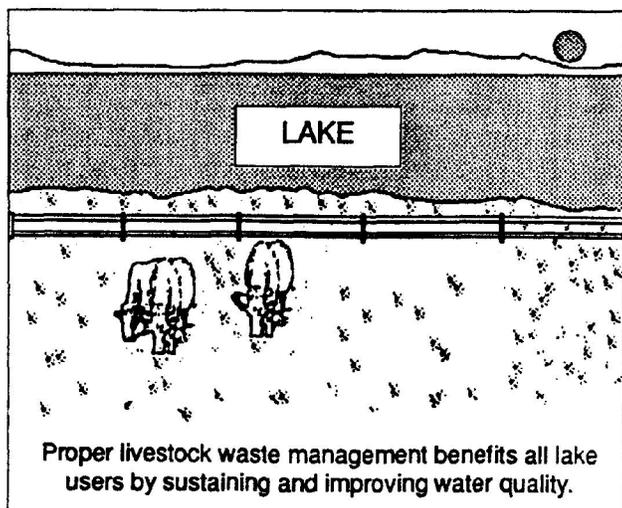
A pathogen is a disease causing microorganism. Possible pathogen contamination in water is determined by using biological indicators. The fecal coliform test is the most commonly used biological indicator.

Fecal coliform are intestinal bacteria found only in mammals and fowl. Fecal coliform are not found in soils, vegetation, insects or fish unless contaminated by mammal or fowl feces. They are not necessarily harmful but indicate the potential presence of other more serious disease-causing organisms.

Fecal bacteria enter surface waters by direct deposit of feces and by movement with sediment in overland runoff. The organisms may be dispersed, lack proper environment, and die, or they may find conditions sufficient for long-term survival in bottom sludge or lake bank soils. Their survival depends on water, soil, and air temperature; lake size and flow rate; sediment volume; availability of nutrients and organic material; amount of light; soil type; pH, and other factors.

Seasonal variations in bacteria numbers can be extreme, depending on runoff volumes, temperature, animal activity, ground cover, and sunlight.

The original source of fecal bacteria in surface water is from livestock, wild animals, fowl, and rural septic tank overflows. Consequently, if fecal coliform is to be reduced, livestock contact with surface water and runoff from manured areas into surface water must be controlled and inadequate shoreline septic systems must be corrected.



### Best management practices for controlling surface water pollution from livestock:

- **Fence animals out of riparian areas located next to surface waters.** Water from lakes and streams can be used for livestock purposes by piping into approved water holding facilities like tanks or nose pumps.
- **Maintain grass buffer strips near surface water.** Provide a grass buffer between surface waters, pasture and cropland.
- **Consider using retention ponds or lagoons** for runoff/waste collection from feedlots.
- **Manage manure and/or lagoon effluent applied to cropland. Do not** apply manure or lagoon effluent on frozen ground or land susceptible to runoff or leaching. Develop and follow a proper nutrient management plan based on soil fertility tests and crop production.
- **Prevent overgrazing of pasture and rangeland through rotational grazing.**
- **Reduce cropland runoff with no-till or low-till tillage practices.**

Many of the above listed best management practices or bmps may be cost shared through the **Northeast Glacial Lakes Improvement and Protection Project**, or project partners: U.S. Fish and Wildlife Service, South Dakota Department of Game, Fish, and Parks, and the Natural Resources Conservation Service.

Targeted watersheds in the project area include:

**Amsden Dam, Blue Dog Lake, Enemy Swim Lake, Minnewasta Lake, Pickerel Lake and Pierpont Dam located in Day County**

**Buffalo Lakes, Clear Lake, Nine Mile Lake, Red Iron Lake, and White Lake Dam located in Marshall County**

**Big Stone Lake and Lake Traverse located in Roberts County.**

For more information on the Northeast Glacial Lakes Watershed Improvement and Protection Project, contact the following project co-sponsors:

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This publication was originally published by the Cooperative Extension Service, Extension Extra 1010, December 1990, updated April 2002, written by Joseph Schumacher, Agriculture and Biosystems Engineering, South Dakota State University

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