Managing Runoff in Shoreland Areas

What we do to the land affects the quality of our water

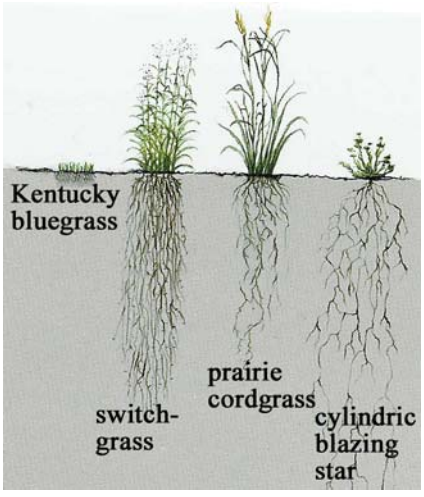
Since its inception in 1970, the statewide standards for the management of shoreland areas have recognized that the management of stormwater and erosion is as important as the management of onsite sewage treatment systems in helping to preserve public water quality. The 1970 shoreland rules provided limits to grading and filling and vegetation alterations in nearshore areas. Impermeable surfaces were limited to 30 percent of lot coverage.

The impacts of stormwater runoff include erosion of bare, unvegetated soil (above) and discharge of pollutants and sediment to our streams and lakes (below).

In 1989, the statewide standards were revised to include a specific section on stormwater management and reduced the impermeable surface cover to 25 percent of a lot. The standards stressed the importance of using existing natural drainages, wetlands, and vegetated soil surfaces to convey, store, filter, and retain stormwater runoff. Shoreland alterations were further refined and controlled within areas established as shore and bluff impact zones.

The problem with stormwater runoff is that we do not always see its effect. Although the impact is easy to see on bare, exposed soil, it is less visible on a lawn. Yet lawn runoff can be a major source of pollutants to a lake. Everything in that lawn, as well as on the streets and driveways, is carried by stormwater runoff. This includes soil particles, fertilizers, pesticides, pet wastes, and plant nutrients. We may not see it, but it is there. Runoff from any one site may not be significant, but as a watershed is built out with more impermeable surfaces, the impacts from these individual sites begin to add up. The effect on surface waters by nonpoint-source pollutants is often gradual but difficult to reverse.

Kentucky bluegrass is not a good filter for stormwater runoff. Grass roots are shallower than the roots of native vegetation. The deeper roots of native vegetation help to hold soil particles in place and enhance aeration and infiltration. Another problem with many lawns is that the site may have been heavily graded during construction. Depressions and swales that retard runoff may have been graded over, topsoil removed, and the underlying soil compacted. Depending on the soil type and construction activity, some lawns are more like pavement in their inability to infiltrate and retard stormwater runoff.



Turf grass, like Kentucky bluegrass (above, far left), is not a good filter for stormwater runoff. In contrast, native vegetation filters better and has deeper roots to hold soil in place.

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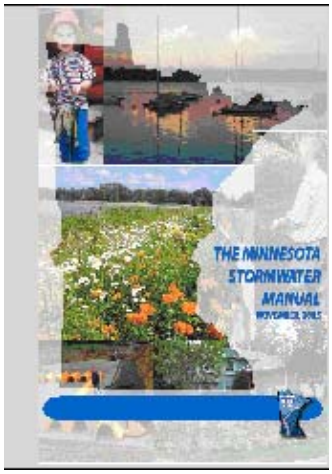
(top) A rainwater garden in St. Paul. **(middle)** Thompson County Park, West St. Paul. Openings in the curb ensure that stormwater is captured by the rainwater garden before reaching the lake. **(bottom)** In a private-public partnership, H.B. Fuller added rainwater gardens to intercept runoff from its parking lot.

Numerous studies compiled by the Center for Watershed Protection and others have shown that the percent coverage of a watershed by impermeable surfaces is a good indicator of a lake's or stream's health and water quality. The effects can be seen in sensitive waters like trout streams when the impervious surface coverage is as low as 5 percent. Generally, when more than 25 percent of a watershed is covered by impervious surfaces, it risks severe and permanent degradation. Studies also show that once degraded, such areas are difficult to restore.

In shoreland areas, preference should be given to designs that increase infiltration by using natural surface drainage, vegetated filter strips, bioretention areas, rainwater gardens, enhanced swales, off-line retention areas, and natural depressions instead of the standard pipe and pond approach.



The Minnesota Stormwater Manual by the Pollution Control Agency provides state-of-the-art best management practices and is tailored to Minnesota's unique conditions.

This approach preserves the health and quality of our waters and reduces cumulative increases in water quantity that can contribute to local flooding. This mimics natural hydrologic processes and restores rainwater as a valuable resource worth keeping and not a wastewater to be disposed. These methods greatly reduce development costs since less infrastructure is required. Not to be overlooked are the enhanced beauty and function that a well-designed system can provide to a yard or neighborhood. The City of Maplewood's numerous rainwater gardens are good examples.

The new way of managing stormwater is to introduce rainwater into the ground near where it falls. The key principle is to ensure that most rainwater infiltrates into the ground instead of treating this water as a waste product and creating problems downhill or downstream.

This new way is small scale and decentralized.This approach, with proper engineering, can reduce the amount of pollutants and nutrients entering our lakes and rivers.

The comments in this brochure address jurisdictional matters and concerns of the DNR, Division of Waters. Please contact your DNR Area Hydrologist to discuss issues relating to your project or this brochure. More information is available at this website: http://mndnr.gov/waters/shoreland.html

Minnesota DEPARTMENT OF NATURAL RESOURCES