Chapter 8: Rein in the Runoff Conclusions and Next Steps

The Rein in the Runoff Integrated Assessment (IA) consolidated and integrated a great deal of complex and widely dispersed information about the environmental, economic, and social aspects of stormwater pollution, control, and management for the Spring Lake Watershed in West Michigan. For more than two years, the project team provided information to different groups of stakeholders regarding the causes and consequences of stormwater runoff, as well as information regarding what individuals and municipalities can do to help control stormwater discharges to Spring Lake, the Grand River, and Lake Michigan. This project report summarizes the technical information compiled, analyzed, and tailored to the Spring Lake Watershed, and it provides local stakeholders with a suite of tools to help watershed communities, residents, and municipal leaders better manage stormwater runoff to Spring Lake and its adjoining waterbodies.

The primary messages for stakeholders to "take home" from this report are the following:

1. Continued population growth and development within the Spring Lake Watershed is resulting in more hardened – and less natural – surfaces, especially closer to the lake. These impervious areas have changed the natural hydrology of the watershed. Instead of rainwater and snowmelt soaking into the sandy soils, they now run off these impervious areas.

2. When rain cannot soak into the ground, it "runs off" these hard, impenetrable surfaces into local waterways – either indirectly through storm drains, or directly from road ends, parking lots, rooftops, and lawns. As the water flows over these surfaces, it collects pollutants and dumps them into Spring Lake, the Grand River, and eventually, Lake Michigan.

3. Different pollutants cause different water quality and water quantity problems:

    a. Pathogens in the water can lead to beach closings and illnesses;
    b. Dirt from erosion – or sediment – can cover fish habitat;
    c. Fertilizers can cause too much algae to grow – as thy die off, the oxygen in the water can be depleted by the organisms decomposing the algae, which can kill fish and other wildlife;
    d. Soaps (from washing your car) can hurt fish gills and scales;
    e. Chemicals can damage plants and animals;
    f. Water gets heated from running over impervious surfaces and can increase stream temperatures and kill fish; and,
    g. Excess water that cannot soak into the ground contributes to and aggravates flooding problems.

4. There are real costs to society to address these types of water quality and quantity problems. The costs are too numerous to mention all of them, but some examples include the following:

    a. Communities that use surface water for their drinking water supply must pay much more to clean up polluted water (North Carolina Department of Environment and Natural Resources 2010);
    b. Flooding causes damage to homes, roads, and other infrastructure; and,
    c. The alum treatment applied to Spring Lake in 2005 to help control algae blooms was paid for by residents living around the lake.

5. If the communities in the Spring Lake Watershed take no additional actions to control and manage stormwater runoff, excessive amounts of nutrients will continue to load into the local waterways during – and as a result of – rain events. The application of alum in 2005 decreased the loading (or release) of phosphorus from the sediments in Spring Lake, but has done nothing to stop new nutrient inputs from entering the lake from the land. If growth and development continue to occur, the nutrient loads to Spring Lake and its adjoining waterways will only increase.

6. The application of a combination of structural and nonstructural stormwater best management practices (BMPs) – particularly Low Impact Development (LID) strategies – to new and existing development throughout the Spring Lake Watershed will be necessary to prevent the continued degradation of water quality in Spring Lake and its adjoining waterways, including the Grand River and Lake Michigan.

7. The stormwater management priorities for the Spring Lake Watershed include the restoration of riparian and littoral buffers; implementation of LID BMPs in the areas that contribute the highest pollutant loads to Spring Lake, which according to the Rein in the Runoff model results are the urbanized sub-watersheds closest to the lake; and road ends immediately adjacent to the lake or other waterways.

8. BMP selection is ultimately up to each individual or municipal landowner. However, the Rein in the Runoff project team offers the following guidance:

    a. Vegetated/bio-swales are suitable for installation along roadways. These BMPs, along with constructed wetlands, are the most cost-effective.
    b. Rain gardens are suitable for installation in residential neighborhoods, parks, schools, and other small sites. These BMPs also have relatively low implementation costs, and their smaller footprint makes them well-suited for areas where land is available but not abundant.
    c. Grow zones, including riparian and littoral buffers, are relatively inexpensive BMPs, with installation costs ranging from $200 - $800 per acre, and annual maintenance costs ranging from $4 – 200 per acre.

d. Green roofs and pervious pavement are more expensive BMPs to implement, and the pollution control benefits, educational opportunities, energy cost savings, etc., should be evaluated on a site-by-site basis.
e. Rain barrels cost $25 - $200 in West Michigan. In addition to the stormwater control benefits they provide, this BMP can also reduce the household consumption (and monthly cost) of water for irrigating lawns and gardens.
f. Tree plantings in new developments can reduce the need for additional stormwater infrastructure. Additional benefits associated with tree plantings include limited increases in property values, pollution reduction, cooler runoff temperatures, and energy saving benefits during the cooling season.
g. In densely developed areas, it might be worthwhile to provide BMPs that store stormwater on a regional basis, such as retention basins.
h. Publicly-owned properties present educational opportunities for BMP installation without complicated land ownership concerns.
i. Nonstructural BMPs, such as ordinances (stormwater, fertilizer, high density development and other changes to traditional zoning rules), animal waste management programs, stormwater utilities, and stakeholder education, should be encouraged for implementation throughout the Spring Lake Watershed.

One of the primary challenges in the completion of the Rein in the Runoff Integrated Assessment project was the limited amount of feedback from stakeholders on the more technical aspects of local stormwater management goals and potential solutions. The issues associated with stormwater and stormwater runoff are complex, and sometimes difficult for members of the general public to grasp. Although a small group of stakeholders was involved in several aspects of the IA, overall stakeholder input was limited. This suggests a greater need for ongoing stakeholder education regarding stormwater runoff – in particular, how stakeholder choices and actions affect stormwater pollution and runoff, as well as the water quality of Spring Lake, its tributary streams, the Grand River, and Lake Michigan.

Going forward, the decision-makers and other stakeholders in the Spring Lake Watershed should use this report, the Rein in the Runoff project website, and the other stormwater management tools provided by the Rein in the Runoff project team. The information contained in the project report chapters and appendices, including the shoreline assessment, project atlas, grant resources, and citizens guide can be used for BMP implementation planning and stormwater educational purposes. For many BMP implementation projects, additional site-specific analyses may be necessary to better quantify the effects of different combinations of BMPs and Low Impact Development strategies. Local landowners and neighboring communities should be encouraged to continue to work together to reduce stormwater runoff and pollution to West Michigan's local waterways. The stormwater management alternatives identified in this report provide guidance to these local communities to meet these goals at a local and regional level.

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