# *Chapter 7: Rein in the Runoff Products and Resultant Projects*

The Rein in the Runoff project team developed a number of project products and tools for the stakeholders in the Spring Lake Watershed to use to help improve local stewardship of, and to better manage and control stormwater runoff to, their local waterways. These tools also provide resources, insight, and guidance to researchers and policy-makers interested in improving water quality through the control and management of stormwater runoff.

## CONCEPTUAL MODEL

It is essential that resource agencies, institutions, and municipalities continue to move forward to resolve environmental challenges, despite incomplete understanding and imperfect information. One mechanism to assist this process is the development of non-quantitative conceptual ecological models. These models provide qualitative explanations of how natural systems have been altered by human-induced stressors, which in turn provides planners, resource managers, and elected officials with the information they need to focus on the best design and assessment strategy (Ogden et al. 2005). Utilizing the data and resources described above, the project team developed an ecological conceptual model to help stakeholders appreciate the complexities of the stormwater problem and think about which attributes of their water resources they most highly value.

The Rein in the Runoff Integrated Assessment (IA) conceptual ecological model for stormwater runoff (Figure 7-1) begins with the key ecosystem drivers affecting stormwater: land use change results in more impervious surfaces, management activities (or lack thereof) result in increased nonpoint source pollution, and climate change affects hydrology. Below the drivers are the stressors to the ecosystem. The influence of hydrology on stormwater impacts is pervasive, as this driver connects to all stressors (cf. Walsh et al. 2005). The stressors impact ecological structure and function, which can also be viewed as potential indicators of stress. Ultimately, local communities determine what value to place on environmental resources and ecosystem services. This model proposes three possible values (fish and aquatic fauna, water quality, and native vegetation), although depending on the ecosystem and the stakeholders, a very different set of societal values may emerge, which in turn may affect the structure of the conceptual model.

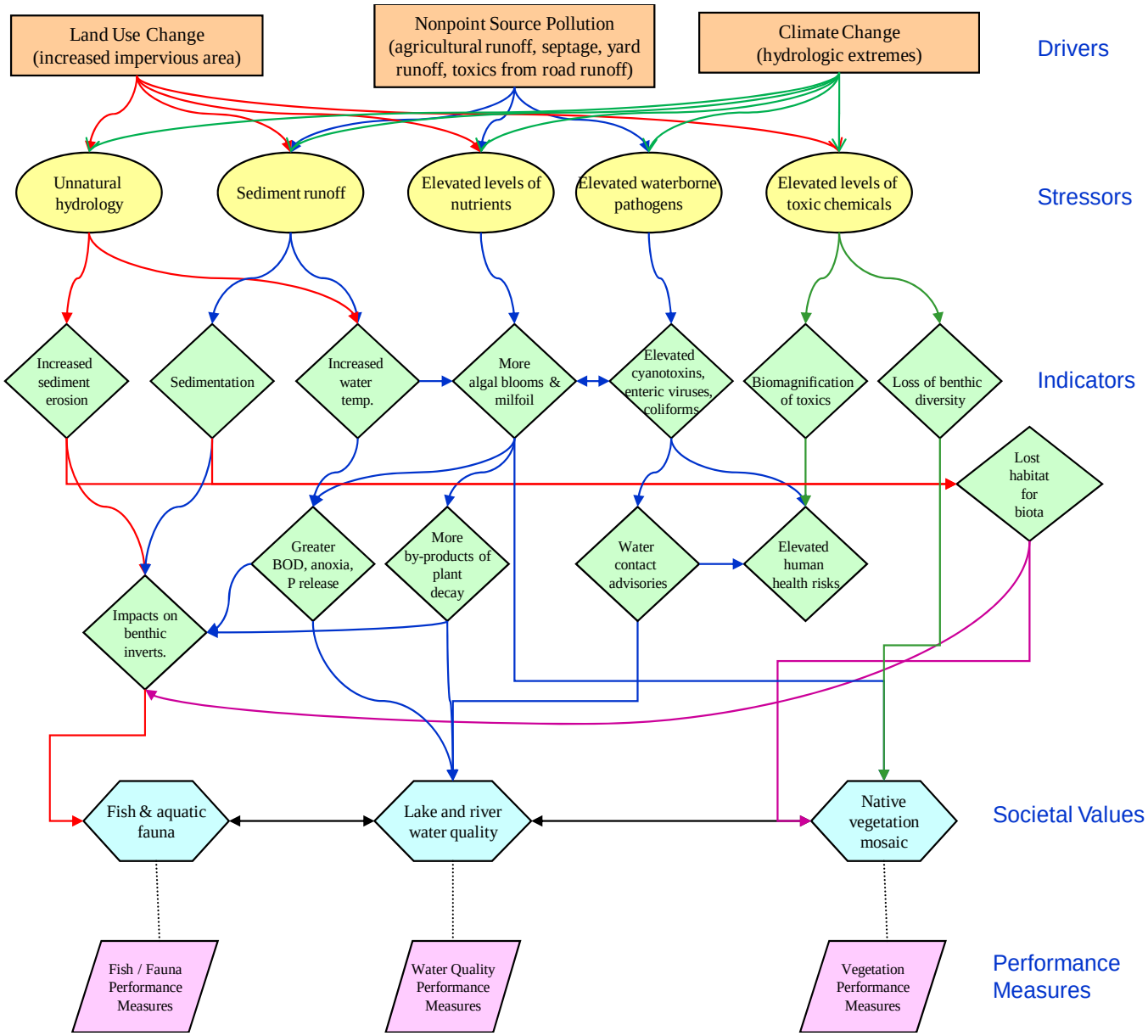


Figure 7-1. Rein in the Runoff Integrated Assessment stormwater runoff conceptual ecological model.

## SPRING LAKE WATERSHED ATLAS

Because of the complex, environmental and social issues associated with stormwater runoff, management, and control, the Rein in the Runoff project team developed a variety of watershed maps to explain the IA project and scope, current watershed conditions, expected and potential future outcomes associated with current stormwater management practices, project results, and the results from additional projects within the Spring Lake Watershed that arose out of this IA (see below).

The Rein in the Runoff Spring Lake Watershed Atlas (CD-Rom version at Appendix L) is available for download on the Project Products section of the Rein in the Runoff project website: http://www.gvsu.edu/wri/reinintherunoff. Full-sized, hard-copies of the atlas are available with copies of this full project report and the Citizens Guide for on-site review at the municipal offices of Spring Lake Township, the Village of Spring Lake, and the City of Ferrysburg; as well at the Grand Valley State University's Annis Water Resources Institute (AWRI), 740 W. Shoreline Drive, Muskegon, MI 49441. Reference and Circulation copies are also at the Spring Lake Library, 123 East Exchange Street, Spring Lake, MI 49456.

Digital copies of the Rein in the Runoff Spring Lake Watershed Atlas are also available to order for $5. This price includes domestic, U.S. Postal Service, 1st class shipping, from AWRI. To order, please contact Elaine Sterrett Isely: (616) 331-3749 or iselyel@gvsu.edu.

## SPRING LAKE SHORELINE ASSESSMENT

As a complement to the Rein in the Runoff IA stormwater project, the Grand Haven Area Community Foundation awarded funding to AWRI to identify the locations along the Spring Lake shoreline that still exist in a natural state – or which have been allowed to revert back to a natural state – and those that have been developed (hardened). The total length of the Spring Lake shoreline is 149,461 feet, and of that, nearly 2/3 (62.2%) has been developed and hardened (Table 7-1). As demonstrated throughout the Rein in the Runoff IA project, it is these hardened, impervious areas that contribute the most stormwater runoff into Spring Lake. It is these areas that can – and should be – targeted for installation of stormwater best management practices (BMP) and Low Impact Development (LID) retrofits (Figure 7-2).

The Spring Lake Shoreline Assessment provides more complete information for Spring Lake Watershed stakeholders about where polluted stormwater runoff enters Spring Lake. It offers additional guidance for local stakeholders to make better decisions about where the placement of stormwater BMPs would do the most good to improve water quality. More detailed results of the Spring Lake Shoreline Assessment, including the close up views of the three Area Maps, can be found in the Rein in the Runoff Spring Lake Watershed Atlas (Appendix L).

Table 7-1. Length and Percent of Shoreline Categories Identified for the Spring Lake Shoreline Assessment Conducted in August 2009.

| Shoreline Category | Length (feet) | % Shoreline |
|---|---|---|
| Boat Launching Area – Concrete Pad | 350.51 | 0.23 |
| Boat Launching Area – Timber Slip | 175.42 | 0.12 |
| Cinder Block Seawall | 150.88 | 0.10 |
| Cinder Blocks – Metal Plates | 248.43 | 0.17 |
| Concrete Pad | 74.45 | 0.05 |
| Concrete Riprap | 3,134.98 | 2.10 |
| Concrete Slip | 5,925.40 | 3.96 |
| Concrete Seawall | 100.64 | 0.07 |
| Concrete Seawall – Metal Seawall Base | 2,034.70 | 1.36 |
| Concrete Seawall – Rock Riprap | 132.95 | 0.09 |
| Concrete and Metal Seawall | 280.13 | 0.19 |
| Decorative Brickwork | 133.85 | 0.09 |
| Metal Seawall | 34,809.15 | 23.29 |
| Metal Seawall – Concrete Riprap | 243.34 | 0.16 |
| Metal Seawall – Rock Riprap | 2,722.81 | 1.82 |
| Metal Seawall – Timber Header | 185.41 | 0.12 |
| Metal Stairs | 73.40 | 0.05 |
| Natural Shoreline | 56,173.62 | 37.58 |
| Open Water (Channel, River, Stream) | 363.06 | 0.24 |
| Rock Riprap | 26,296.26 | 17.59 |
| Rock Riprap – Concrete Footings | 24.81 | 0.02 |
| Stone Seawall | 94.98 | 0.06 |
| Timber Seawall | 14,809.27 | 9.91 |
| Timber Seawall – Rock Riprap | 114.51 | 0.08 |
| Timber Deck | 43.22 | 0.03 |
| Timber Pilings – Old Docks/Retaining Structures | 238.45 | 0.16 |
| Timber Seawall – Concrete Footings | 169.67 | 0.11 |
| Timber Seawall – Concrete Riprap | 356.77 | 0.24 |
| **TOTAL** | **149,461.07** | **1.00** |

## FUNCTIONAL WETLANDS ASSESSMENT

Researchers at AWRI also conducted a landscape level functional assessment of the wetlands in the Lower Grand River Watershed, of which the Spring Lake Watershed is a tributary. This project was funded by Region 5 of the U.S. Environmental Protection Agency to identify how the extent of wetland change within the greater watershed has impacted the functional services generally provided by those wetlands. Because of the Rein in the Runoff IA project, the Spring Lake Watershed was selected as a targeted sub-watershed for this wetland assessment. Preliminary locations were identified within the Spring Lake Watershed where there is high potential for floodwater storage, sediment retention, and nutrient transformation. Additional information about the Functional Wetlands Assessment in the Spring Lake Watershed can also be found in the Appendix to the Rein in the Runoff Spring Lake Watershed Atlas (see Appendix L of this report).

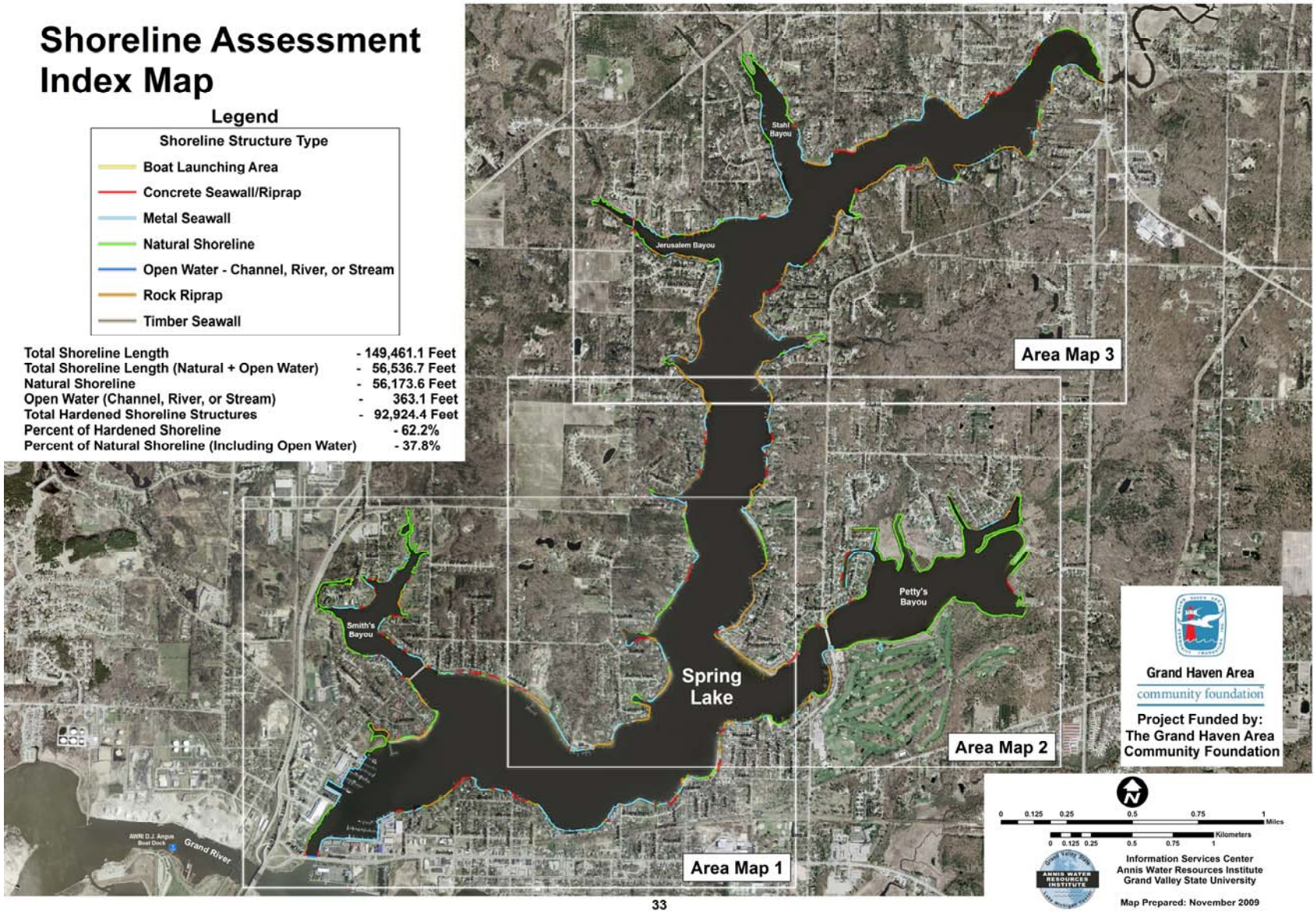


Figure 7-2. Spring Lake Shoreline Assessment of the hardened and natural shoreline features of Spring Lake (MI) in August 2009.

## GRANT RESOUCES

At the request of the primary municipal partners that participated in the Rein in the Runoff IA project – the Village of Spring Lake, Spring Lake Township, and the City of Ferrysburg – the project team conducted research on potential funding sources to assist these communities with implementation of the Rein in the Runoff project outcomes. The primary research resources used were the Foundation Directory database (http://fconline.fdncenter.org/), the Michigan Great Lakes Plan Implementation Workshop's Near-Term Action Priorities subcommittee review of existing grant and loan programs supporting low impact development, the Grand Valley State University Office of Grants Development and Administration, and the FY2010 Great Lakes Restoration Initiative Interagency Funding Guide (Great Lakes Restoration Initiative 2010, http://greatlakesrestoration.us/action/?p=161, January 11).

Grant resources were identified by the project team as potential sources of funding for stormwater management, Low Impact Development, or other nonpoint source pollution control projects (Tables 7-2 and 7-3). The resources listed in Tables 7-2 and 7-3 are provided here as a guide to assist local stakeholders with finding potential sources of grant or loan funds. Funding sources or programs not listed in Tables 7-2 or 7-3 should not automatically be excluded as a potential funding source. Each funding source, program, or agency should be contacted directly to determine current funding priorities, application deadlines, and eligibility.

Table 7-2. Potential Sources of Federal Funding for Stormwater Management and Nonpoint Source Pollution Control Projects.

| Funding Source | Description | For More Information |
|---|---|---|
| **Federal Resources** | | |
| Great Lakes Restoration Initiative | Funding will be available for FY2010 and FY2011 through multiple federal agencies for Nearshore Health and Nonpoint Source Pollution. | http://greatlakesrestoration.us/action/?p=161 |
| USDA Rural Water and Waste Disposal Program | USDA Rural Development field Community Programs office administers these funds to certain cities and rural areas to construct and/or modify water, sewer, stormwater, and solid waste disposal facilities. The funds can go towards acquiring land, water sources and water rights, as well as paying the legal and engineering fees associated with the development of these facilities. Only cities with a population of less than 10,000 are eligible for these funds. | http://www.rurdev.usda.gov/mi/cp/cpmain.htm<br><br>Grand Rapids area office:<br>Rickie Youngblood, Area Director<br>Todd MacLean, RUS Specialist<br>Paul Bristol, CF Specialist<br>3260 Eagle Park Drive, Suite 107<br>Grand Rapids, MI 49525<br>(616) 942-4111, ext. 6<br>(616) 949-6042 – fax<br>todd.maclean@mi.usda.gov<br>paul.bristol@mi.usda.gov |

Table 7-3. Potential Sources of State and Private Funding for Stormwater Management and Nonpoint Source Pollution Control Projects.

| Funding Source | Description | For More Information |
|---|---|---|
| **State Resources** | | |
| Michigan Department of Natural Resources & Environment | Clean Water Revolving Fund: MDNRE makes low interest loans to local units of government for the construction of publicly owned wastewater collection/treatment facilities or the construction of nonpoint source water pollution control projects. Projects funded with Recovery Act money can receive some amount of forgiveness of loan principal. | http://www.michigan.gov/deq/0,1607,7-135-3307_3515_4143---,00.html |
| Michigan Department of Natural Resources & Environment | Clean Michigan Initiative (CMI) has several programs that could potentially help fund stormwater and nonpoint source pollution problems:<br>• Clean Water Fund (CWF)<br>• Nonpoint Source<br>• Pollution Prevention<br>• Contaminated Sediments<br>• Waterfronts<br>• Local Parks | http://www.michigan.gov/deq/0,1607,7-135-3307_31116---,00.html |
| Michigan Department of Natural Resources & Environment | MDNRE has additional grant and loan programs:<br>• Local Water Quality Monitoring Grant<br>• State Revolving Fund<br>• Illicit Connections Grant<br>• Targeted Watershed Grants Program | http://michigan.gov/deq/0,1607,7-135-3307_3515---,00.html |
| **Private Funders** | | |
| Freshwater Future | Program and Technical Assistance Grants are small grants for grass-roots, volunteer-based organizations for projects to protect and restore wetlands; restoration activities; land use planning and zoning; or development, implementation and enforcement of local, state, provincial and federal habitat protection regulations. | http://www.freshwaterfuture.org |
| Great Lakes Protection Fund | GLPF supports collaborative actions to improve the health of the Great Lakes ecosystem. | http://www.glpf.org |
| Wild Ones Natural Landscape, Inc. | Lorrie Otto Seeds for Education Program provides $100-$500 for native plants and seeds to small schoolyard projects that involve student volunteers and teaching about native plants. | www.for-wild.org |

## TECHNICAL PRESENTATIONS AND PUBLICATIONS

Rein in the Runoff project team members also made several presentations and wrote articles for scientific and technical audiences regarding the Rein in the Runoff Integrated Assessment (IA) stormwater project in the Spring Lake Watershed (Appendix M). The Rein in the Runoff project team also anticipates submission of additional manuscripts to peer-reviewed scientific and policy journals at the conclusion of the IA.