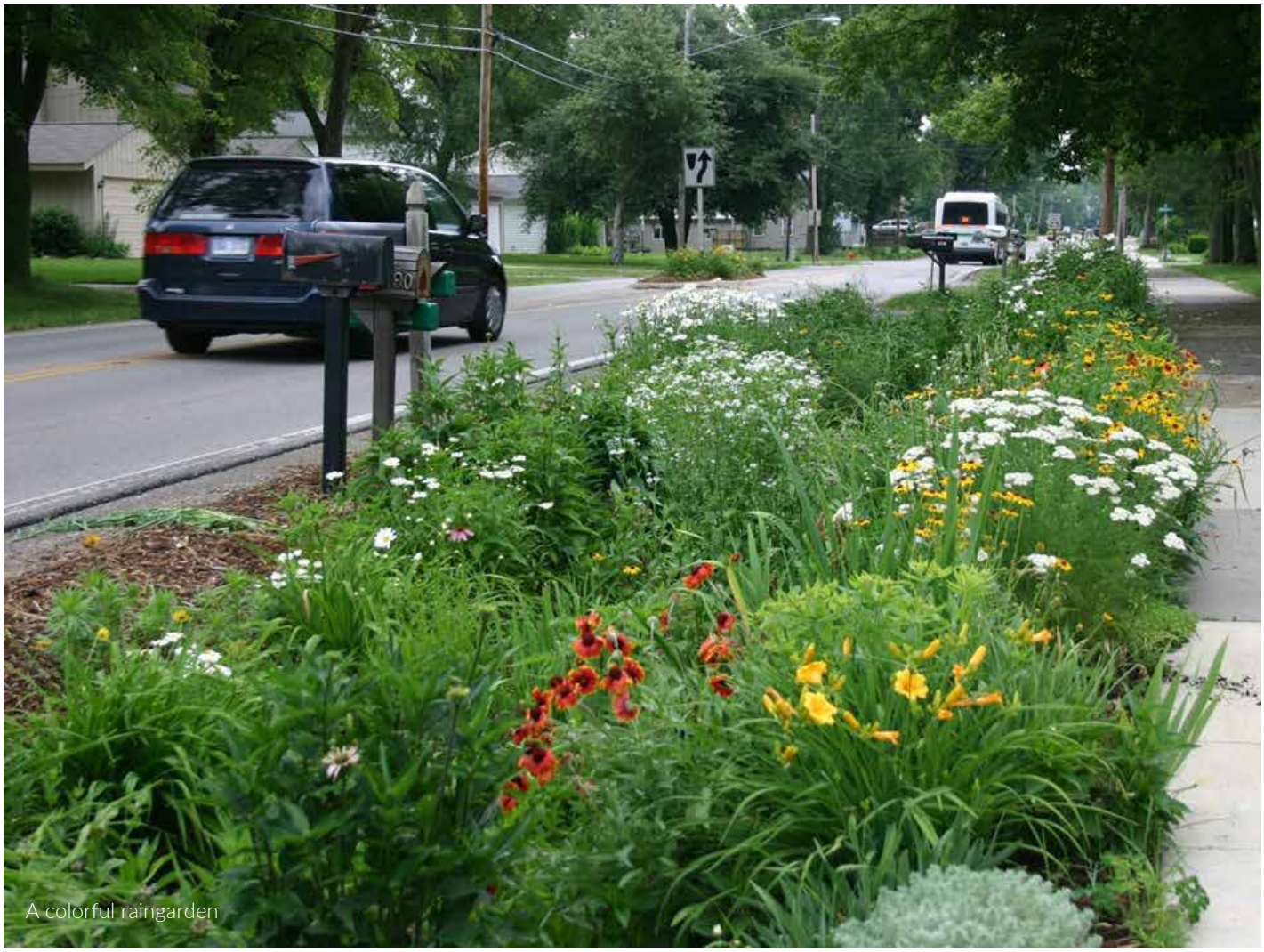

A colorful raingarden

Green Stormwater Infrastructure: Building sustainable and resilient communities

GSI PRACTICES CAN PROTECT OUR LAKES BY REDUCING POLLUTANTS

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What happens when it rains? How we handle rainfall and where the water goes influences the quality of our lakes and rivers, and impacts our everyday lives. Roadways and buildings have replaced areas that were once forested. Because of this urbanization, rainfall does not filter through the soil but instead runs off oily parking lots, fertilized lawns, salty roads, and other hardened landscapes and eventually makes its way into our waterways unfiltered. Today we address a topic you might not have previously considered: stormwater runoff and management. Stormwater runoff is considered one of the greatest threats to clean water in the United States.

Stormwater runoff occurs when rainwater or melted snow flows over the ground, picking up pollutants and debris along the way. Historically, stormwater was handled through combined sewer systems, where both stormwater runoff and sanitary sewage flowed together in a single network of pipes to the nearest treatment facility. This approach worked well under normal precipitation events, but during heavy rainfall, the combined system would become overwhelmed. This leads to untreated sewage overflowing into our lakes and rivers. Today, many (but not all) urbanized areas have separated stormwater from sanitary sewage lines. This means that our sanitary waste travels to a treatment facility, while unfiltered stormwater leads directly to our rivers and lakes via storm drains. This untreated stormwater can have several negative impacts.

As urban areas expand and more land is developed, the natural landscape is altered. Increased impervious surfaces such as roadways, parking lots, and buildings lead to an increased volume

and velocity of runoff. They can also cause higher water temperatures because sealed surfaces absorb sunlight and heat up faster than natural areas. In addition, stormwater runoff often contains pollutants such as oil, debris or fertilizers.

To address the problems created by untreated stormwater runoff, communities across the country are recognizing the need for Green Stormwater Infrastructure (GSI) practices. GSI refers to a range of techniques that manage stormwater runoff by mimicking nature's processes. Instead of using curbs and gutters to channel runoff directly to the nearest storm drain or water body, GSI practices aim to capture, treat, and store stormwater onsite. This allows it to settle and infiltrate the soil. Examples of GSI techniques include rain gardens, vegetated buffers, bioswales, constructed wetlands, permeable pavement, and green roofs. You have likely seen some of these practices near businesses and new development projects in your community. These techniques provide many benefits, including improved water quality, flood control and beautification of our landscapes.

Some communities also have local regulations in place that mandate the use of these techniques and promote responsible land development practices. An MS4 (Municipal Separate Storm Sewer System) community refers to a local government or municipality that has separated its sanitary and storm sewer systems. Many MS4 communities are regulated under the Clean Water Act, which requires them to manage stormwater runoff within their jurisdiction. Communities may install large-scale GSI projects on land owned by the municipality and require that stormwater design standards be followed for areas of redevelopment or new development of a certain size threshold (for example, on sites greater than one acre).

Lakefront property owners are also in a unique position to protect lakes from stormwater pollution. Installing a garden along the shoreline is one way to filter stormwater. Shoreline gardens also add beauty and provide additional habitat for birds, fish, and other wildlife. Another simple way to capture and redirect water is with a rain barrel. Rain barrels are placed at the end of downspouts and collect water from rooftops and store it for later use. When placed on elevated platforms, rain barrels make watering easy since gravity provides the water pressure. Another way to bring beauty and functionality to landscapes is with a rain garden. These are typically four to eight inches deep and can be designed in any shape or size. They are planted with a variety of deep-rooted native plants which help capture and filter water and are often placed near driveways or downspouts – places where runoff is common.

Get connected with the MSU Extension Smart Gardening program to learn about nature-friendly landscaping techniques that help reduce pollutants and improve water quality. Learn more at www.canr.msu.edu/smartshorelands.

Michigan State University Extension provides resources and support to lakefront property owners and managers. Visit the MSU Extension website (http://extension.msu.edu) to explore our Natural Resources programs and sign up for electronic newsletters on the topics of your choice. Contact your county MSU Extension office for more information.