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# NATURESCAPING FOR THE ROUGE RIVER

## Restoring the Ecology of Our Home Landscapes

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*The process of “naturescaping” is similar to natural or beneficial landscaping. By reflecting on natural processes and community environmental needs, landscapes can be designed which have functional as well as aesthetic benefits. Biodiversity can be preserved by restoring natural functions and native habitats that once existed on the site. Even a small yard, school garden or public park can incorporate a meadow border, woodland glade, or small wetland that filters storm water.*

*Individual sites can be linked together with shrubs, grassed swales, or other vegetation. With a planned approach, environmental corridors with significant water quality benefits can be created.*



*“When we see the land as a community to which we belong, we treat it with respect.”*

*- Aldo Leopold*

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## *What Is An Ecosystem?*

Ecosystems (e.g., ecological systems) are functional, self-contained environments that result from the interaction of living and non-living components. Each ecosystem has four major components:

- 1. Physical environment** – non-living materials such as minerals, water, and air.
- 2. Producers** – living plants which manufacture food through photosynthesis.
- 3. Consumers** – living organisms that eat the producers.
- 4. Decomposers** – living organisms such as bacteria, fungi, and other organisms that turn once-living materials into organic matter - an essential component of healthy soil.

The components of ecosystems are interconnected – no part can survive without the other.

The word “ecology” is from the Greek word “oikos” which means house. Ecology is, therefore, the study of the “environmental house”, including all of its inhabitants.

Ecosystems can be large or small. The Earth is an ecosystem... as is a decomposing log in the forest. A pond, wetland, or a forest can be considered an ecosystem if it is self-sustaining.

Gardens may have ecosystems within them and they may also be part of larger ecosystems. Because gardens are often changed from time-to-time (e.g., weeding, watering, planting, rotation of plants, etc.) they are usually not self-contained ecosystems. However, observations and lessons learned in the garden can be transferred to natural areas in the community to support important ecological restoration projects.

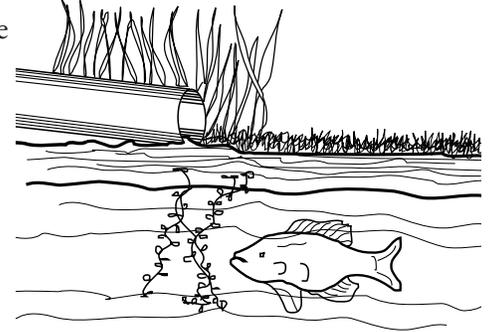
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# *The Issue in Southeast Oakland County: Pollution from Storm Water Runoff*

The Rouge River is cleaner today than it has been in many years. Residents who reported smells of sewage as recently as 6 years ago now express their delight that the river is more of a natural resource “close to home.”

But much remains to be done. Storm water runoff carries pollutants such as sediment (soil particles with pollutants attached), fertilizers and pesticides; pet wastes; manure from geese and ducks; failing septic systems; and oil, grease and salt from roads. These pollutants are swept into storm drains which discharge quick flushes

of rainwater to the Rouge River. Some storm water also runs off the land in sheet flow, and a small amount infiltrates into the ground.



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## *The Historical Perspective – Landscape Alterations from Drainage and Urban Development*

Before 1830, the Rouge River was a system of small creeks and wetlands, joining together and feeding into the large main stream branches. The landscape was dominated by beech-maple forests, oak-hickory forests, savannas (grasslands and trees), meadows, and prairies. In order to make use of the land for agriculture and settlement, wetlands were gradually filled and drained and water was pushed underground into pipes.

The natural landscape provided many “free services” to its inhabitants. During rain and snow melt events, wetlands and feeder streams held the storm water like a sponge. During droughts, the wetlands gradually released their water, helping to sustain fish and wildlife.

The forests and savannas held the soil in place, supported clean air, and held soil in place. Leaves and other organic matter contributed to soil fertility in a cyclical fashion. Meadows with prairie grasses and wildflowers provided food and shelter for insects and small creatures. Prairie plant roots reached deep into the soil, providing natural fertility and a stable ecosystem – quite unlike today’s residential turfgrass environment.

In the rush of urban development and drainage projects, the natural landscape was severely altered. Now the challenge is to reestablish sustainable landscapes including wetlands, woodlands, and prairie meadows.

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## *Pre-settlement Vegetation Maps – A Landscape Planning Reference*

Pre-settlement vegetation is an important part of the community’s “ecological address” – and an important step along the road to ecological literacy.

Pre-settlement vegetation is the vegetation that occurred across Michigan’s diverse landscapes at the time of European settlement. Before land in Michigan could be sold for the first time to settlers, the federal government required that it be surveyed. The surveyors’ township plat maps (made between 1816 and 1856) provide an excellent record about Michigan’s pre-settlement native landscape – providing tree species names and locations

along the section lines surveyed. Recently, ecologists from the Michigan Natural Features Inventory (MNFI) used information from the original field notes and plat maps to compile pre-settlement vegetation maps for Michigan counties.

The Oakland County pre-settlement vegetation map indicates the communities of plants that were best adapted to local soils, land forms, and climate.

Maps are available for purchase from the Oakland County Development & Planning Division at 249-858-0720.

# Wildflower Meadows and Prairies – An Alternative to Lawns

Wildflower meadows and prairies are two examples of sustainable landscapes. Ecologically, they may be tallgrass or lakeplain prairies (dominated by grasses), savanna (mixture of grassland and woodland plants), wildflower meadows (wildflowers and some grasses) or some combination of these types.

Meadows and prairies have a constantly changing mosaic of species in an ongoing process of adaptation and survival. When planted in an urban environment, they offer the following benefits:

- 1. Low maintenance:** Most prairie plants are perennials – growing back each year. In a mature, established prairie, a thick mat of ground vegetation is produced which minimizes the introduction of invasive plants. Wildflower meadows in public parks require mowing only once a year. Fertilizers and pesticides are not needed. These factors translate into cost-savings for the public.
- 2. Filtering air pollutants:** Wildflowers and tall grasses trap pollutants on their leaves and stems. Wildflowers which may grow 2 or 3 feet tall are more efficient at trapping pollutants than turfgrass – a factor which is particularly important near highways. Once pollutants are trapped by vegetation, they are less likely to run off into streams and rivers.

- 3. Deep roots which encourage infiltration of storm water:** Native grasses and flowers put approximately 2/3 of their growth deep into the soil. Long roots reach deep into the soil for moisture and store food reserves for the plants. Other grasses and even trees do not make such a large investment below the ground.
- 4. Root systems which build fertile soil:** The roots of many prairie plants enhance fertility, break up clay soil, and contribute more nutrients and organic matter than they consume. The open prairie grasslands of the Midwest produced the world's most fertile soils – a lesson which can be applied in urban areas.
- 5. Wet meadows that improve water quality:** Native vegetation in naturalized drainageways enhances the infiltration of contaminated storm water. Dense, deep root systems enhance soil permeability and help with the uptake of certain storm water pollutants. Native vegetation buffers are particularly effective along the edges of streams, lakes and wetlands.

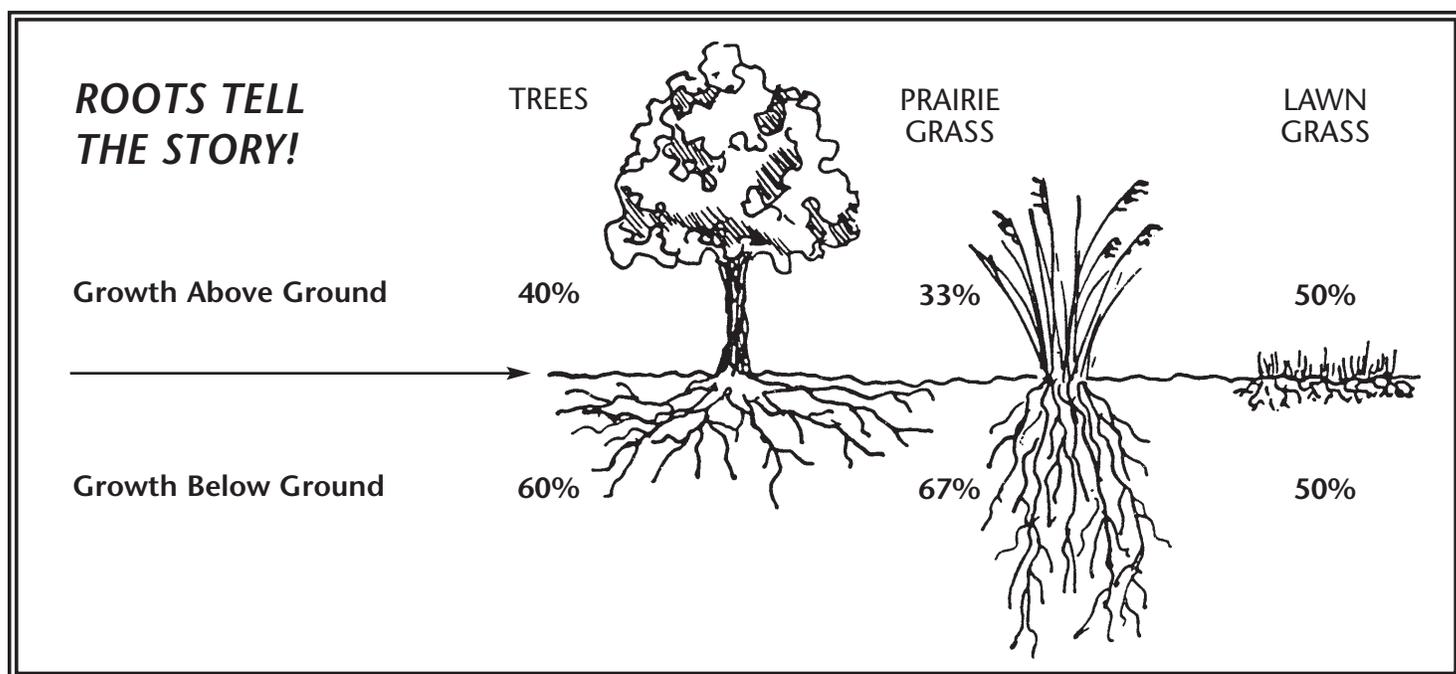


Illustration from Prairie Primer, University of Wisconsin Extension, 1998 reprint.



## *Sustainable landscapes...*

are those that exist with a minimum of outside energy, materials, and labor. They are productive landscapes, since they hold and often produce organic material which replenishes soils and the earth. Sustainable landscapes support diverse communities of plants and animals, appropriate to the locale. Sustainable landscapes foster understanding of the natural history and natural processes of a place. They also meet the direct needs of the community for water quality and environmental quality.

### **Ecological Landscaping Principles**

*Recommended by the Healthy Lawns and Gardens  
Technical Advisory Committee for Oakland and Wayne Counties:*

- 1. Consider biodiversity** and the natural prevention of pest and disease problems when planning and planting the landscape.
- 2. Minimize impervious surfaces** and encourage retention and infiltration of storm water. Integrate natural drainageways, ponds, and wetlands into the landscape design.
- 3. Select plants which are native to Michigan** and suitable for the soils, drainage, exposure and other characteristics of the site. Combine native and non-native (non-invasive) species to meet design and maintenance goals.
- 4. Remove highly-invasive plants** which prevent the establishment of diverse native vegetation.
- 5. Connect individual sites** to form ecological corridors.

