

ROUGE RIVER CURRICULUM CONNECTIONS

STORM DRAINS ARE NOT GARBAGE CANS

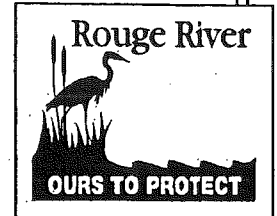
2003-2004

SCIENCE CURRICULUM OBJECTIVES: Hydrosphere

Describe how human activities affect the quality of water in the hydrosphere.

SOCIAL STUDIES CURRICULUM OBJECTIVES: Core Democratic Values

Consider the effect of an individual's actions on other people, how one acts in accordance with the rule of law, and how one acts in a virtuous and ethically responsible way as a member of society.



Out of Sight But Not Out of Mind

As Oakland County communities gradually developed during the early decades of the 20th century, pavement, buildings, and pipes changed the landscape. The natural wetlands and depressions on the land surface were considered to be obstacles to progress. Today, government agencies and scientists are looking for ways to restore natural ecosystems in cost-effective ways, recognizing the benefits for water quality and cost-effective resource management.

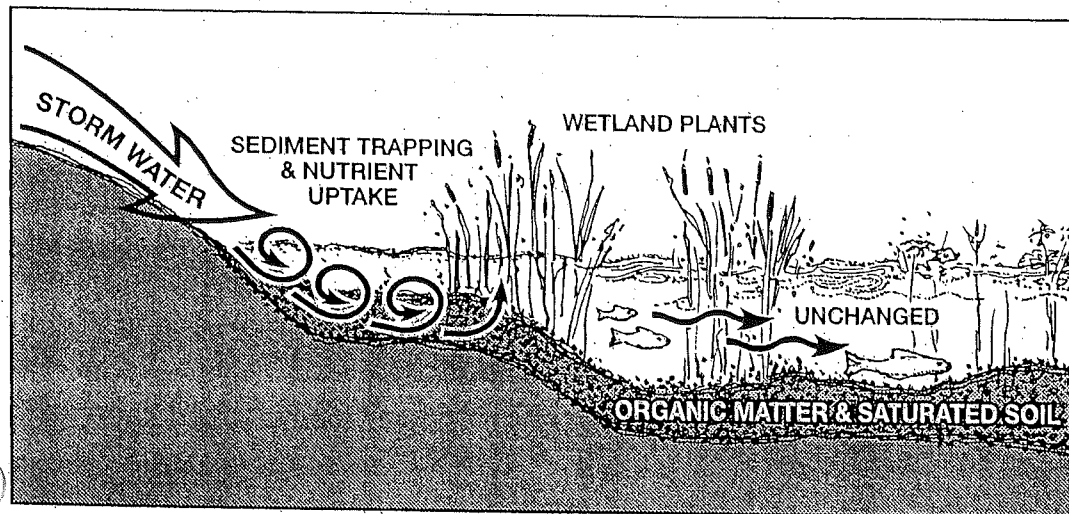
Wetlands Protect Water Quality

New wetlands and storm water retention basins are being built in the Rouge River watershed to buffer the River from storm water flows and pollution. Whenever possible, natural storm water retention is integrated into new development and redevelopment sites.

Wetlands help protect water quality by trapping sediment (which carries pollutants) and by breaking down some pollutants, especially nitrogen and phosphorus. Nutrients are taken up by plants which,

in turn, are eaten by insects, birds and mammals. Storm water wetlands are not as pristine as a natural wetland, but they often provide important nature study areas and scenic beauty – plus providing a cost-effective approach to water quality.

WETLANDS HELP PROTECT WATER QUALITY

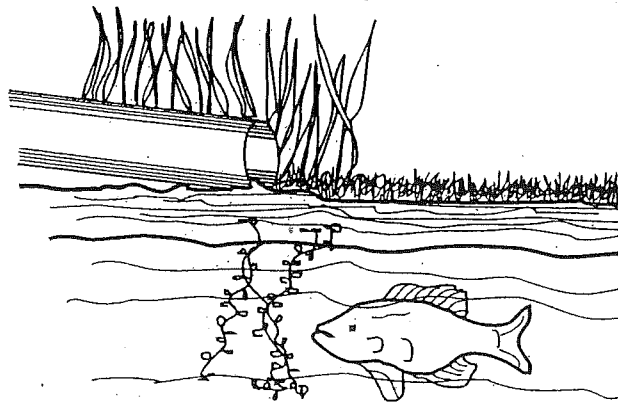


Down the Drain...But Which Drain?

THREE TYPES OF UNDERGROUND PIPES CARRY STORM WATER AND/OR SEWAGE:

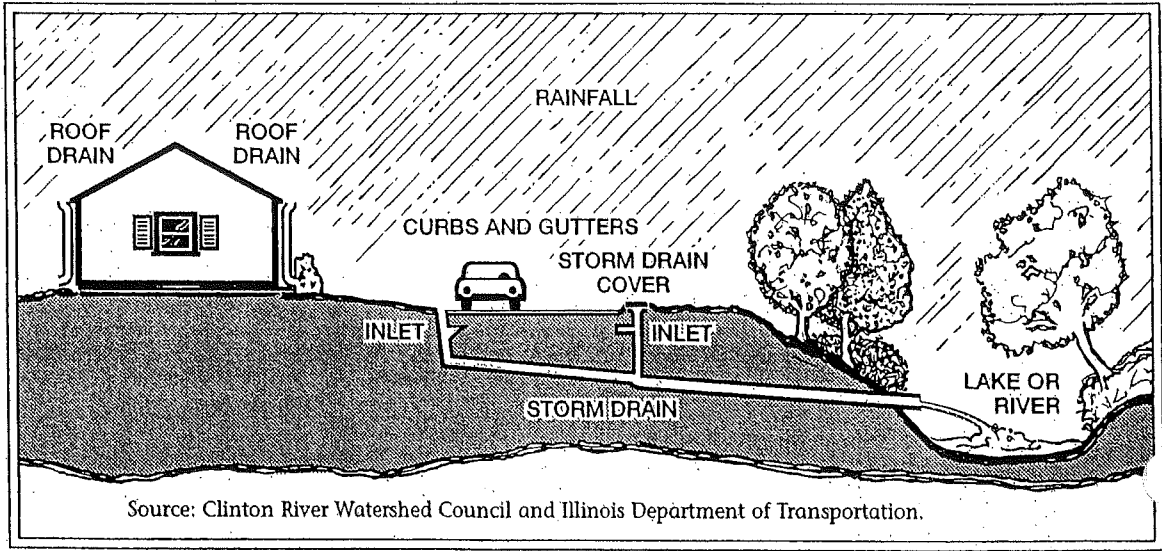
1. Pipes carrying sewage to the Detroit wastewater treatment plant: Indoor sinks and toilets connect via underground pipes to the wastewater treatment plant in Detroit. Wastewater is treated and many pollutants are removed. The residual wastewater is discharged to the Detroit River in accordance with state permits. Solids (sludge materials) are spread on a designated land site.
2. Storm drain pipes: These pipes carry storm water from roads, roofs, parking lots, lawns, and roads — and carry the storm water to retention areas or the Rouge River (see diagram below).
3. Combined storm water and sanitary sewage pipes (now an out-of-date technology): These pipes transport storm water and sewage to the Detroit wastewater treatment plant. Unfortunately, the capacity of the pipes is exceeded during rain storms.

In the Rouge River watershed (Southeast Oakland County), large-scale retention basins have been built to hold the high volumes during most storms. Overflow to the Rouge River is very infrequent. This modern technology has resulted in major water quality improvements and is one of the successes of the Rouge River National Wet Weather Demonstration Program.



OAKLAND COUNTY/ROUGE WATERSHED COMMUNITIES WITH SOME COMBINED SEWERS: Birmingham, Beverly Hills, Bingham Farms, and Bloomfield Township.

UNDERGROUND STORM DRAIN SYSTEM



Native Plants...Part of the Solution to Pollution

Native plants help us understand our "roots" — in all senses of the word. Native plants were in our communities before settlement and "fit" with local soils and climate conditions. They tend to survive easily without extra fertilizer and pesticides and help us teach stories about the past, present, and future.

Native plants helped settlers in the Rouge River watershed. Plants were used for dyes, food, materials for shelter, medicines, and more.

Once established, native plants provide direct water quality benefits:

- Many wildflowers, shrubs, and trees have roots which soak up runoff and encourage infiltration into the ground.
- Native plants planted in compost remove

pollutants from runoff.

- Diverse plants means diverse insects and micro-organisms which contribute to ecological stability.

For a native plant information package for Southeast Oakland County, contact SOCWA, Southeastern Oakland County Water Authority at 248-288-5150. The Oakland Land Conservancy, the Hardy Plant Society, WildOnes, and other local organizations sell native plants from time-to-time — check garden calendars in the spring and fall for upcoming events.

Rain Gardens for the Rouge

A rain garden is a small "dish garden" that receives rain water from a roof, parking lot, lawn or other area — hopefully intercepting storm water before it reaches a storm sewer.

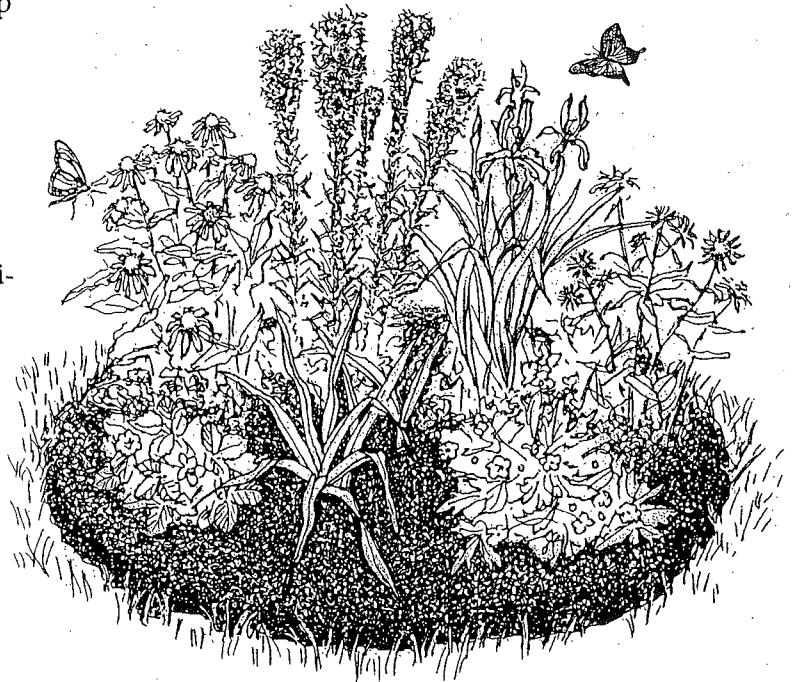
Rain gardens may be as simple as an improved drainage swale, or they may involve underdrains and soil replacement to improve pollutant removal. Many rain gardens are designed to trap water for a short period of time — less than two days. Storm water filters through the soil and compost of the garden where pollutants are broken down. Plant roots take up the nutrients and water.

Some native wildflowers and grasses are ideal for rain gardens. Always study your site to identify whether it is sunny, shady, very wet, or wet only at certain times. Then select plants that fit the site.

Sun loving native wildflowers that also like moist, organic soils include Columbine, Swamp Milkweed, Turtlehead, Joe-Pye Weed, Boneset, Blue Vervain, Ironweed, and many others.

Many native wildflowers also are nectar plants for butterflies or food sources for butterfly caterpillars (larva).

Why not consider a rain garden for your school yard? Walk through your school grounds and observe where rain water naturally collects... and where storm drains are located. Select a site where runoff will be naturally trapped — providing a pollution prevention lesson that will teach the entire school community!



Storm Drains Are Not Garbage Cans!

LET'S WORK TOGETHER TO RESTORE THE ROUGE RIVER

Walk through your neighborhood and school grounds. What types of outdoor activities might create pollution that could reach storm drains?

Here's a checklist of concerns:

- Excessive lawn fertilizer
- Weed-and-feed lawn products with pesticides
- Exposed soil which washes into streets and sewers
- Leaking garbage cans
- Pet wastes and manures

- Manures from ducks and geese — especially at parks
- Oil drips from cars

Who is responsible for these sources of pollution? What can you do to help?

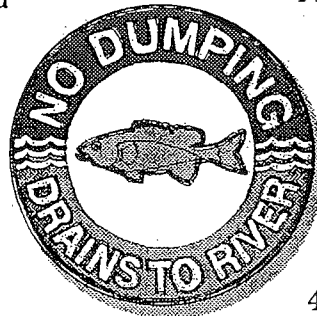
For a copy of the *Rouge Repair Kit – A Citizen's Guide to Restore and Protect the Rouge River*, contact your local government, the Oakland County Drain Commissioner's Office, Friends of the Rouge, or SOCWA (Southeastern Oakland County Water Authority).

Class Project Instructions

STORM DRAIN MARKER:

"NO DUMPING – DRAINS TO RIVER"

1. Walk around the school grounds and locate a storm drain cover. You can often hear the storm water running through the pipes in the drain. Some drains are in the grassed areas of the school grounds, while others are near parking areas and roads.
2. When a storm drain has been identified, obtain permission from the school administration to apply the storm drain marker. Markers usually remain on the drain cover for 6 months or a year – and then need to be reapplied.
3. Steps for applying the marker include the following:
 - Clean the drain cover surface with a wire brush. The surface must be clean, dry and free of any loose debris. Paint, oil or other materials may affect adhesion.
 - Apply adhesive to the back of the marker. Start 1/8 inch in from the outside edge and apply the glue in a spiral, working in toward the center.



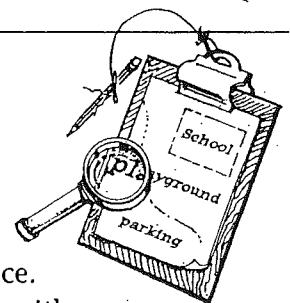
Plastic storm drain marker

- Place the storm drain marker on the surface.

Push down **HARD** with a twisting motion, forcing the adhesive out from the edge.

It is important that the entire edge of the marker be sealed to the surface.

4. Take a photo of the group and send it to your local newspaper. Make posters for the school, with suggestions for protecting the Rouge River.



Discussion Questions:

- Why would any person intentionally dump oil or hazardous chemicals into a storm drain?
- What should you do if you see illegal dumping?
- What materials might naturally flow into the storm drain (other than storm water) that could create serious water quality problems?
- Are there locations on the school ground where a rain garden could trap storm water before it reaches a storm drain?

