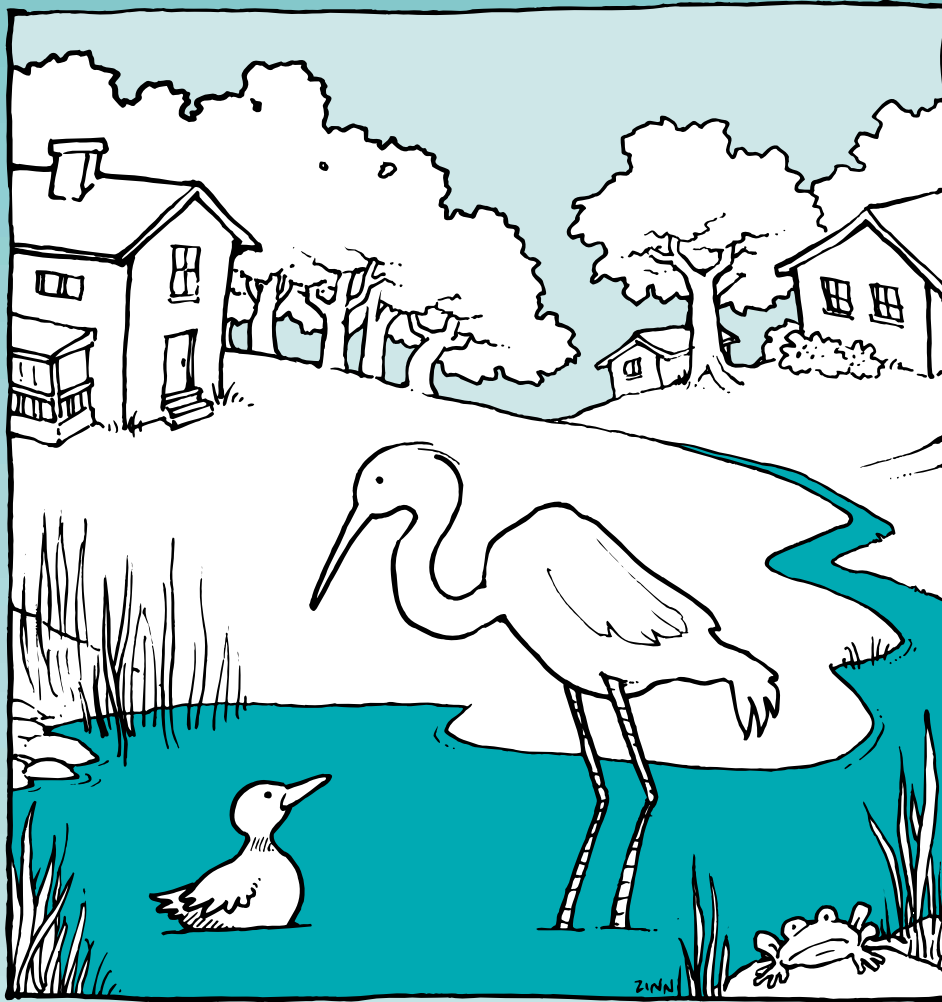




The Homeowner's Handbook

A Guide to Water Quality Protection for
Homeowner Associations & Households

Janis A. Bobrin
Washtenaw County Drain Commissioner

Summer 2001



Guide to the Guides:



Guide No. 1 - Protecting Water Quality



Guide No. 2 - Catch Basin Care



Guide No. 3 - Maintaining Septic Systems



Guide No. 4 - Car Care



Guide No. 5 - Stormwater Pond Maintenance



Guide No. 6 - Controlling Garden Pests



Guide No. 7 - Landscaping Near the Water's Edge



Guide No. 8 - Rethinking Lawn Care



Guide No. 9 - Prescription Drug & Personal Care Product Disposal



Protecting Water Quality



Guide No. 1

They're Our Waterways

Did you know that the major source of pollution to our creeks, ponds, and streams is stormwater runoff? As rain water flows over land it picks up a variety of pollutants, including eroded soil, trash, fertilizers and pesticides. Automobile fluids, including motor oil, antifreeze, gasoline, and brake fluid, contain trace metals and chemicals that often leak from vehicles onto streets and parking lots. These pollutants may make their way into storm sewers and ultimately into nearby streams and rivers.

The Rouge River, Huron River, Raisin River, Paint Creek, and Stony Creek are the major waterways that flow through Washtenaw County. These river systems and their tributary creeks lie within watersheds—the land that drains into them.

Washtenaw County is fortunate to have many high quality waterways. If they are to stay that way, we must all play a part; every activity on the land has an impact on our water resources.

What You Can Do

The information presented in these guides is intended to inform local homeowners and homeowners' associations of the role they can play in pollution prevention and stream protection.

Topics covered by these guides include:

Guide No. 1 Protecting Water Quality

Guide No. 2 Catch Basin Care

Guide No. 3 Maintaining Septic Systems

Guide No. 4 Car Care

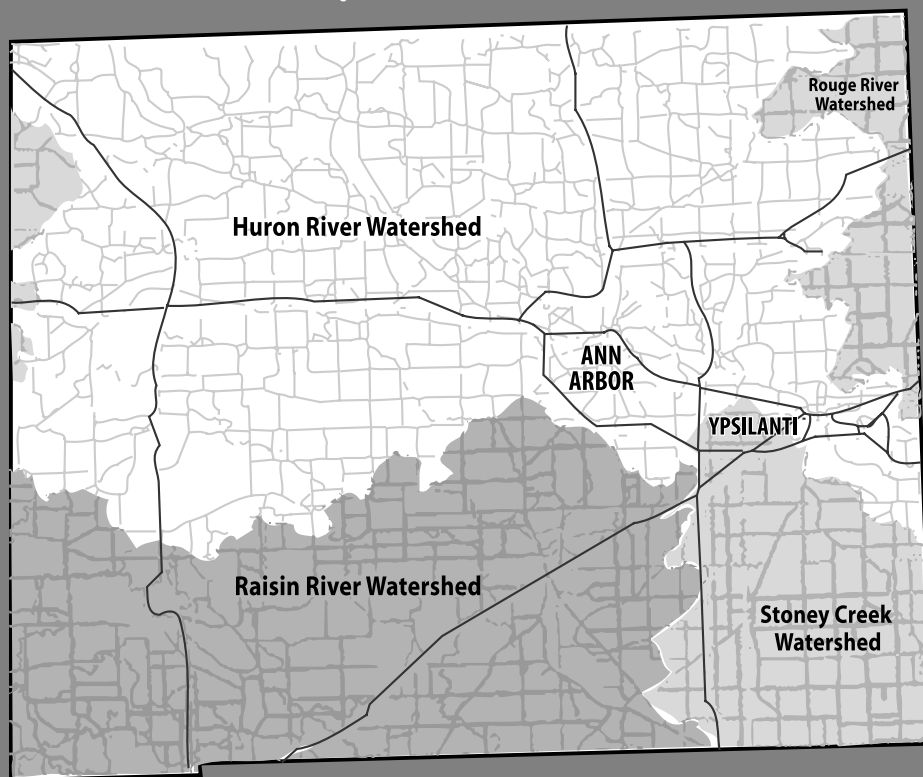
Guide No. 5 Storm Water Pond Maintenance

Guide No. 6 Controlling Garden Pests

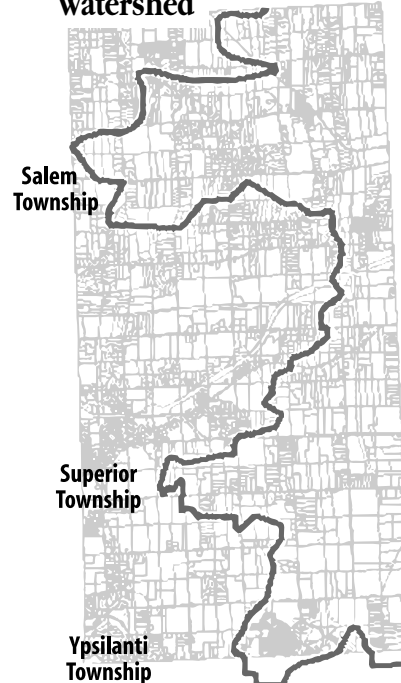
Guide No. 7 Landscaping Near the Water's Edge

Guide No. 8 Rethinking Lawn Care

Washtenaw County Watersheds



Washtenaw County Rouge Watershed



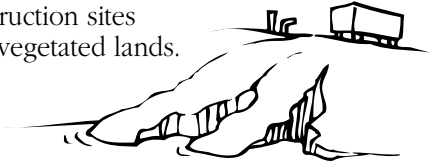
Washtenaw County is working with Salem, Superior, and Ypsilanti Townships to protect and improve the waters of the Rouge River.

POLLUTANTS: Their Sources and Impacts

A pollutant is any substance that can harm living things. Pollutants commonly found in Washtenaw waterways include:

SOIL/SEDIMENT

Source: Construction sites and other non-vegetated lands.



Impacts: Uncontrolled soil erosion can result in excess sediment that clogs catch basins, storm sewers and detention basins, leading to higher maintenance costs and flooding. As it settles, sediment can smother fish eggs and bottom-dwelling organisms, and destroy aquatic habitat. Suspended sediment can lower the transmission of light through water and can negatively affect aquatic animals.

Other pollutants can attach to soil particles. When sediments wash off the ground into waterways they carry these pollutants with them.

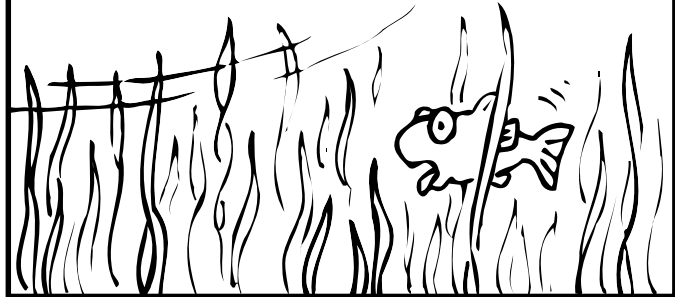


NUTRIENTS

Sources: Septic systems, lawn fertilizers, animal waste, cleaning products, plant debris and eroded soil.



Impacts: Phosphorous and nitrogen can over-stimulate aquatic weed and algae growth. As they decay, excess weeds and algae use oxygen in the water, which is needed by fish and other aquatic life.

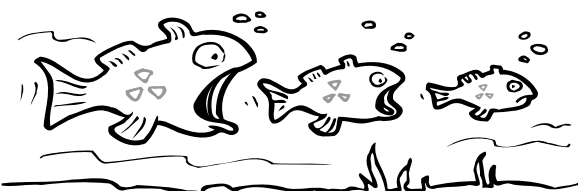


TOXIC COMPOUNDS

Sources: Toxic substances include vehicle fluids, solvents, lawn herbicides and pesticides, paints and metals such as chromium, copper and mercury.

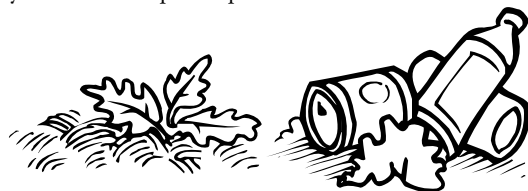


Impacts: Toxins can accumulate in the aquatic food chain, as one larger organism eats many smaller ones that have been contaminated. Even in very small concentrations, oil and other toxic substances can harm aquatic plants and animals.

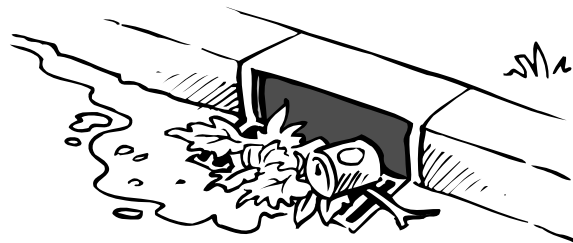


LITTER AND DEBRIS

Sources: Grass clippings, leaves and litter generated by careless disposal practices.



Impacts: Litter and leaves that wash into storm sewers can clog detention basin inlets and outlets, and eventually pollute streams and rivers. Excessive leaves and other organic materials decompose and lower the amount of oxygen available to aquatic life.





Catch Basin Care

Guide No. 2

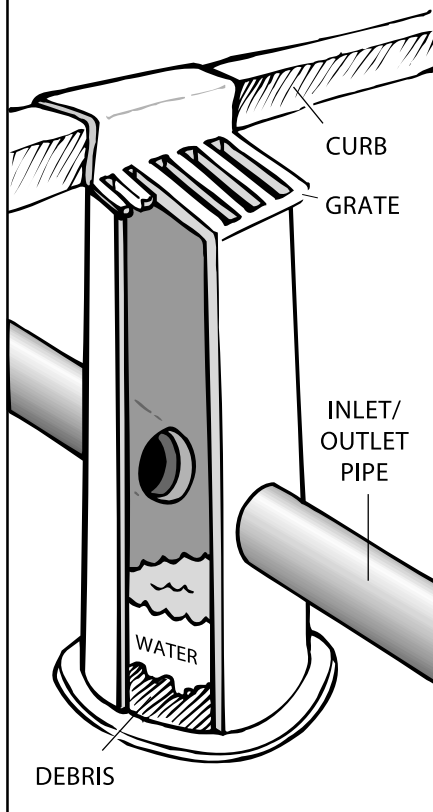


Why be concerned?

Catch basins are storm sewer inlets that filter out debris such as leaves and litter. They are typically located next to street curbs or in the rear yards of residential areas.

It is important to maintain catch basins to prevent storm sewer blockages and minimize the amount of pollutants entering storm sewers. Storm sewers either discharge into detention basins or directly into streams.

Clogged catch basins can also cause water to pond along streets and in yards. This flooding can be a nuisance to motorists and homeowners.



Are You Responsible for Catch Basin Care?

Your Homeowner's Association is responsible for catch basin maintenance if you live in a subdivision, site condominium or attached condominium neighborhood with private roads. Catchbasins in public roads are maintained by the Washtenaw County Road Commission or your City or Village Public Works or Utility Department.

Stormwater drainage systems are typically designed to remove water from a developed area as quickly as possible during a storm. While these systems are convenient for urban residents, they also carry pollutants to surface waters at a "rapid transit" pace. Contrary to popular belief, pet wastes, oil and other materials dumped into storm sewer grates do not go to the waste water treatment plant, but flow directly into streams and lakes. For example: dumping oil into a storm sewer grate has almost unthinkable consequences. When it reaches the water, five quarts of oil can create a slick as large as two football fields and persist on mud or plants for six months or more.

How are Catch Basins Maintained?

1) Remove Debris from Grates

The grates of catch basins can become clogged with litter or leaves, especially in the spring and fall. Regularly inspect the grate and remove debris. Encourage neighbors to adopt the catch basins in front of their homes, and keep them free of debris.

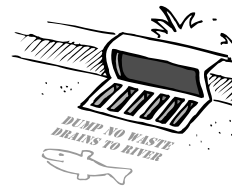
2) Remove Debris from Storage Area

Catch basins should be cleaned out before the storage area is half full. Once this level is reached, debris begins to

wash into sewer pipes. Cleaning should be done in the spring after the first large snow melt, in the fall after trees have shed their leaves, and additionally if needed.

To find out how much material has accumulated in the storage area of a catch basin, insert a long pipe or broom stick into the storm drain grate. Notice where the pipe or stick hits the debris and continue to the bottom to estimate the depth of accumulation. Cleaning these storage areas should be performed by a private contractor. For assistance identifying suitable contractors, contact one of the agencies listed under "Getting Help."

Stenciling Your Storm Drains



Stenciled or applied decals that read "Dump No Waste - Drains to Rouge River" are a good reminder that nothing but water belongs down a storm drain. Contact the Drain Commissioner's Office for more information about participating in storm drain stenciling.

GETTING HELP

Washtenaw County
Drain Commissioner (734) 222-6860

Washtenaw County
Road Commission (734) 761-1500

Your City or Village Utility
Maintenance Dept.

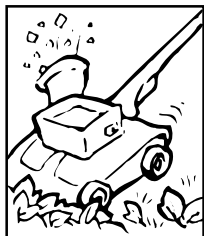
Michigan Department of
Environmental Quality (800) 662-9278

see the Washtenaw County website at
www.co.washtenaw.mi.us

Protect Our Waterways at Leaf Collection Time

In a way, we all live on a river. Water that enters our storm drains flows directly into a stream or river untreated, along with everything that rainwater carries away from our streets: trash, leaves, grass, fertilizers, pet wastes, etc. Reducing pollutants from rainstorm runoff is one of the biggest hurdles to keeping our river clean.

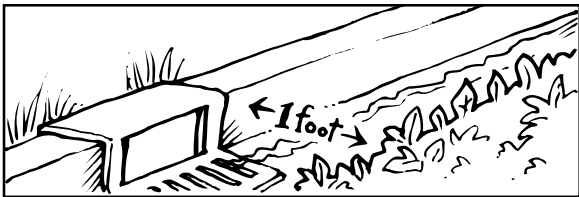
During the Fall, it is especially important to keep leaves out of the storm inlets. In addition to clogging drains and causing backups, leaves that enter the storm drains decay in the water and rob fish of vital oxygen. Follow these steps to give our waterways a hand; you'll also reduce the risk of flooding on your street.



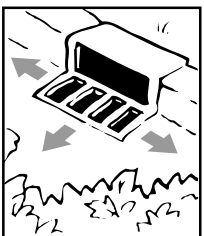
1. Compost yard waste. The next time you mow, mulch the leaves while cutting the grass. They're the best nutrients. You can also put leaves in compost containers for curbside collection.



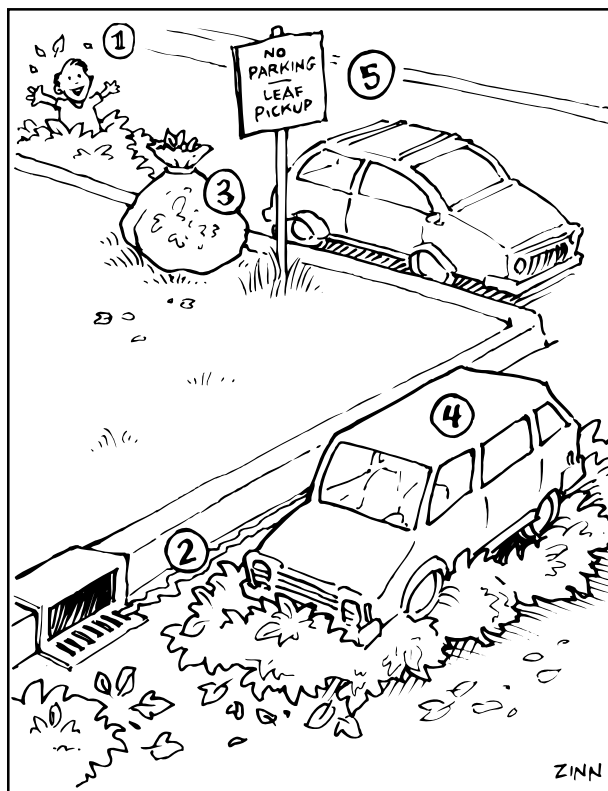
2. Wait until the last minute. If you have your leaves picked up by a community's leaf collection program, rake the leaves into the street just prior to your scheduled pick-up day. Should it rain, leaves won't enter the storm drain inlets and waterways as easily if they are raked and stored on your lawn extension for as long as possible.



3. Stay out of the gutter. If your community does allow you to sweep leaves to the street for collection, be sure to keep leaves out of the gutter. There should be at least a one-foot space between the curb and your leaves for the stormwater to run into the gutter. This will reduce the risk of flooding in your area.



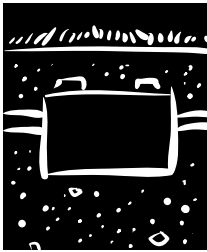
4. Keep inlets clear. Reduce the risk of flooding and help protect the environment by removing accumulated debris from catch basin grates. Don't deposit yard or pet wastes into catch basins.



Fall Street Leaf Collection Reminders:

- 1 Remind children not to play in street leaves.
- 2 Leave one foot of space between the curb and leaves for stormwater to run into the gutter.
- 3 Leaves in plastic bags are not accepted.
- 4 Do not park vehicles over dry leaves to avoid potential fires.
- 5 Do not park on streets with posted tow-away signs. Cars can be ticketed and towed.

Remember that street leaves are usually picked up on a schedule, weather permitting. Street leaf pickups may be delayed if a City's trucks are needed to clear street snow. If the leaf collection schedule is delayed, new collection dates will be assigned. Call your local City, Village or Township Hall for leaf pickup and scheduling.



Maintaining Septic Systems



Guide No. 3

Why be concerned?

Septic systems are wastewater treatment systems designed to collect all wastewater from residences where sanitary sewer systems are not available. They are typically designed to be effective over a 20-year period if properly maintained.

Poorly maintained and failing septic systems can cause serious problems. Sewage from overloaded systems can pond on the ground near the drainfield or back up into buildings. Inadequately treated septic liquids can contaminate ditches, creeks and shallow drinking water supplies. Animals and people may become ill from contact with these polluted waters. In addition to public health concerns, it is costly to repair or replace a failing system.

Time of Home Sale Inspection Regulation

Washtenaw County has adopted a regulation for the inspection of well and septic systems at time of property transfer. For more information, call Washtenaw County Environmental Health at (734) 971-4542. Download the full text of the regulation at: www.co.washtenaw.mi.us/DEPTS/eis/OWSDShome.html

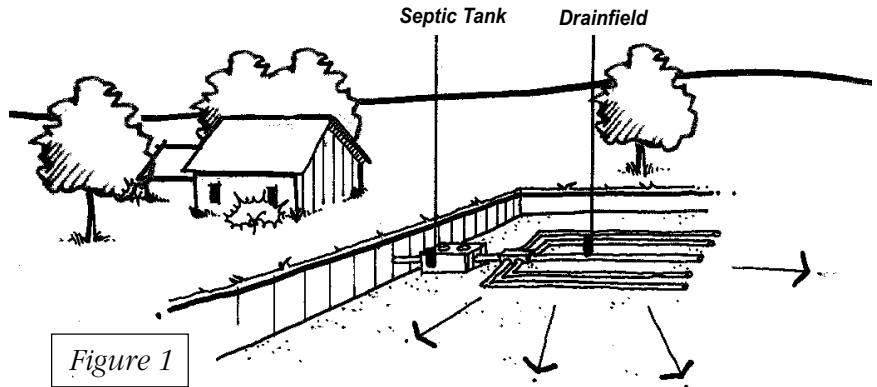


Figure 1

How the Septic System Works

A septic system consists of a septic tank and a drainfield (Figure 1). Wastewater flows from the house to the septic tank where natural bacteria begin to break down the solid materials. This breakdown reduces solids in the wastewater, but leaves a sludge residue behind in the tank that builds up and must be removed to prevent it from entering the drainfield and clogging the system.

The center liquid layer flows slowly from the tank (Figure 2) into the drainfield. The drainfield is made up of perforated pipes that equally distribute the wastewater across the gravel-filled drainfield. The liquid then soaks into the soil that acts as the final filter for treatment of wastewater received from the septic tank.

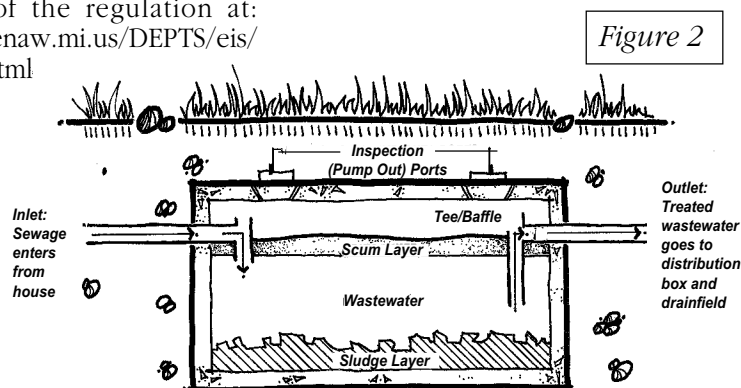


Figure 2

Do's and Don'ts if You Are on a Septic System

DO's

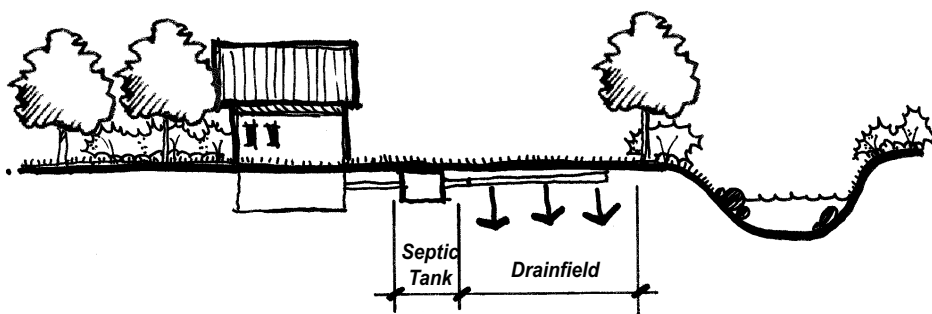
- Learn the location of your septic tank and drainfield. Keep a sketch of it handy with your maintenance record for service visits. Obtain a copy of your septic permit from the Washtenaw County Environmental Health Division, if possible.
- Connect laundry and kitchen water to the septic tank.
- Divert other sources of water, like roof drains, house footing drains and sump pumps, to lawn areas away from the septic system. Excessive water keeps the soil in the drainfield saturated and prevents adequate treatment of the waste water.
- Have your septic tank pumped out by a licensed operator every 2-3 years.
- Have the operator make sure there is a tee or baffle on the outlet of the septic tank. The baffle stops the scum from floating into the drainfield.

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- Check with the Washtenaw County Environmental Health Division if you are having problems. Staff can assist with operation, maintenance and design questions.
- Take leftover hazardous household chemicals to your approved home toxics waste collection center for disposal.
- Use bleach, disinfectants and toilet bowl cleaners sparingly and in accordance with product labels. Preferably use alternative cleaning products as recommended in the Home Toxics Guide included with this handbook.

- Don't plant trees or shrubs on, or directly adjacent to, the septic tank or drainfield. The roots from the plants could damage the system.
- Don't cover the drainfield with a hard surface such as concrete, asphalt, above-ground pools or decks. This area should have a grass cover.
- Don't repair your septic system without checking with the Environmental Health Division to see if you need a permit.
- Don't use a kitchen garbage disposal unit. Heavy use adds large quantities of solids and shortens the life span of the septic system.



Limit water entering your tank:

- Use water-saving faucets, showers and toilets.
- Minimize the amount of water used for bathing and dishwashing.
- Drain appliances one at a time.
- Spread clothes washing over the entire week and avoid half-loads.
- Check toilets for leaks at least once a year by putting a few drops of food coloring into the toilet tank. If colored water appears in the toilet bowl, you have a leaking toilet.

Don'ts

- Don't enter a septic tank. Toxic gases are produced by the natural treatment processes and can kill humans in minutes. Take extreme care when inspecting a septic tank, even when just looking into the lid opening. Better yet, leave this to a septic system professional.
- Don't allow heavy vehicles to drive over, or park on top of, the septic system.

- Don't use commercial septic tank additives. These products do not help, but may harm your system in the long run.
- Don't use your toilet or sink as a trash can. Pouring harsh chemicals and cleansers down the drain can kill the beneficial bacteria that treat your wastewater and contaminate the groundwater.

Do not flush or wash solids down the drain:

- coffee grinds
- meat fat
- grease or oil
- cigarette butts
- disposable diapers
- personal hygiene items
- dental floss
- kitty litter
- paper towels

The same goes for hazardous chemicals, such as:

- paints
- paint thinners
- oils
- photographic solutions
- varnishes
- pesticides
- gasoline
- household cleaning products

These items can overtax or destroy the biological digestion taking place within your system. In addition, the hazardous chemicals can contaminate your groundwater.

What To Do If Your System Is Failing

Signs that your system is failing:

- Sewage backup in drains or toilets.
- Slow flushing toilets, sinks or drains.
- Visible liquid on the surface of the ground near the septic system. It may or may not have an odor associated with it.
- Lush, green grass over the drainfield, even during dry weather. Often, this indicates that an excessive amount of liquid from the system is moving up through the soil, instead of downward, as it should.
- Build-up of aquatic weeds or algae in lakes or ponds adjacent to your home. This may indicate that nutrient-rich septic system waste is leaching into the surface water.
- Unpleasant odors around your house.
- Gurgling sounds in the sinks and drains.

If your system exhibits one or more of the failure indicators, contact Washtenaw County Environmental Health staff for assistance in assessing the situation. Sometimes the system can be repaired without complete replacement. Sewage contains harmful bacteria, so keep pets and children away from the system. Limit water use until repairs can be made. If a new system or major repairs are needed, a permit is required from the Washtenaw County Environmental Health Division.

GETTING HELP

Washtenaw County
Environmental Health (734) 971-4542

Home Toxics Hotline
(24 hrs.) (734) 971-7356

Washtenaw County Home Toxics website:
www.co.washtenaw.mi.us/depts/eis/eishhw.htm



Car Care

Guide No. 4



Why be concerned?

Washing cars in your driveway can add pollutants to streams and rivers. Wash water that enters storm drains often contains detergents, oil, grease, heavy metals and dirt. Storm drains eventually discharge directly to local waterways.



Vehicle fluids dumped down a storm drain or directly into a waterway can cause serious problems. Four quarts of oil, the amount it takes to fill an automobile's engine, can form an eight acre oil slick in a river. Other vehicle fluids such as antifreeze are poisonous to people, fish and wildlife. Many cats and dogs have died from drinking sweet-tasting puddles of antifreeze found on driveways, in ditches or near storm drains.

Washing Tips

- Wash your car at a commercial car wash that uses water efficiently and disposes of the wash water properly. Or, wash your car on the lawn to prevent soapy runoff from entering storm drains or roadside ditches.
- Remove dirt around the wheels first with a wire brush. Collect the soil with a broom and dispose of it in a manner that will keep it out of storm drains.
- Use plain water whenever possible or non-phosphate biodegradable detergents and mild soaps, such as vegetable oil-based soaps.
- Wash one section of the car at a time and rinse it quickly using a pistol grip nozzle with high pressure and low volume.
- You may want to check with your City or Township to determine whether parking your car on your lawn for a brief period of time to accomplish car washing is permitted.



Car Maintenance Tips

- If you change vehicle fluids like motor oil or antifreeze at home, take the waste fluids to a recycling center (see "Getting Help") or an oil change facility.
- Always use a drip pan under your work and use funnels when transferring fluids. Investigate using an oil change kit designed to absorb used oil.
- Never mix waste oil with gasoline, solvents or other liquids before recycling.
- Change vehicle fluids in the garage whenever possible. If a spill occurs, pour kitty litter, sawdust or cornmeal on the spill to absorb the liquid. Place the waste material in a strong plastic bag and dispose with your trash.
- Inspect vehicles regularly for leaking oil and fluids, and make repairs immediately after problems are detected.

Recreation Vehicles and the Disposal of Sanitary Waste

Currently, there are no municipal authorities in Washtenaw County that provide sanitary waste disposal generated from recreation vehicles. Be certain to properly dispose of RV sanitary wastes at your campground or park designated facility since it may be difficult to locate alternative facilities that will accept sanitary wastes from RVs not using their campground services. Check the telephone directory for any local campgrounds that may provide this service.

GETTING HELP

Michigan Department of
Environmental Quality (800) 662-9278

Washtenaw County Household
Hazardous Waste (734) 971-7356

Home Toxics Disposal Program (734) 222-6865



Stormwater Pond Maintenance

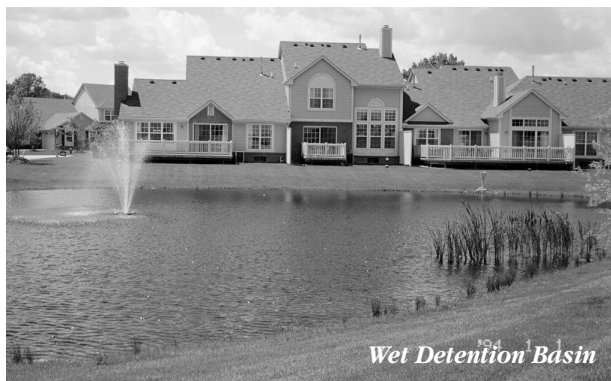


Guide No. 5

Why be concerned?

Homeowners' Associations and business owners have first line responsibility for maintaining their stormwater ponds. Called detention or retention basins, these facilities require maintenance to ensure that they function properly. Poorly maintained basins, regardless of their design, lose their ability both to control flooding on private property and prevent pollutants like sediments, fertilizers and pesticides from entering local creeks and streams near homes and businesses.

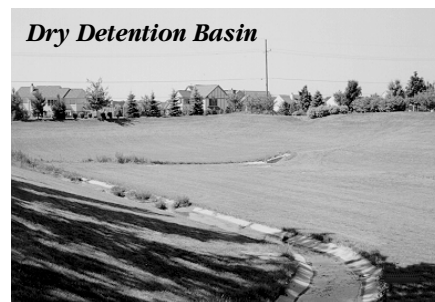
Stormwater ponds are included in new residential, commercial, and industrial developments because development replaces open land and forest with impervious surfaces such as parking lots, roads and roof tops. As stormwater runs off these impervious surfaces it enters streams and rivers at a much faster rate, causing streambank erosion and possible flooding downstream. Stormwater ponds help to control potential flooding and improve water quality.



What are Stormwater Ponds?

Stormwater ponds are included in new development to control the stormwater runoff from a developed site, to prevent downstream flooding and channel erosion, and to improve water quality. There are several different pond designs that can serve these functions. Some ponds are generally dry, holding water only after rainstorms, and metering it gradually off site and down stream. Others are permanently wet ponds, and others are a combination, with a wetland area surrounded by a dry area for storage of stormwater. When stormwater is held in a pond, sediments and other pollutants can filter out before water leaves the site. Ponds with wetland vegetation can provide habitat as well as effective removal of many water pollutants carried in stormwater. Pond outlets are designed to ensure proper storage time, and gradual release rates.

Dry Detention Basin



What Kind of Maintenance Do Stormwater Ponds Require?

No matter how well designed, stormwater ponds must be maintained regularly to prevent flooding, and to protect property and the quality of local waterways. Litter and debris can clog inlets and outlets, accumulated sediment can take up important storage capacity, and structural failures can result. At a minimum, a homeowner's association should conduct a comprehensive annual inspection of its stormwater ponds (and entire stormwater management system), as well as spot inspection after all major storms. It's advisable to secure the services of a professional engineer to inspect the structural elements of the pond annually and to compare them to the "as built" engineering plans for the pond. The engineering design plans for the stormwater ponds in

your subdivision or site condominium may be available from the Washtenaw County Drain Commissioner or your municipality's engineering, utility, or development department.

Obtain a Copy of Your Stormwater System Maintenance Plan

For developments designed after 1994 and reviewed by the Washtenaw County Drain Commissioner, a maintenance plan and budget should be on file with that office. The plan should identify the components of the stormwater system and the type and frequency of maintenance required for each. In addition, an estimated cost of annual maintenance should be included. This can help homeowners' associations to budget for the necessary work. If a plan is not available, the Drain Commissioner's staff will help your association to develop one. General guidance for stormwater pond maintenance is described on the following page.

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General Guidelines for Stormwater Pond Maintenance

Remove accumulated sediment

The sediment that collects in stormwater ponds should be removed every 5-10 years, or more frequently, depending on accumulation. Professional services should be secured for this job. Most ponds have adjacent areas where sediment can be spread, seeded, and covered with mulch for stabilization. Make sure that sediment cannot run back into the pond from this area. If there is no suitable common area for spreading sediment, it may have to be transported off site to an approved facility.

Newer ponds, constructed after 1995 should have a sediment "forebay," a separate excavated area at the pond inlet, designed to capture sediment. By isolating the sediment in a smaller area, maintenance is easier and less costly, though it may have to be performed more frequently.



What is the Drain Commissioner's Role in Stormwater Pond Maintenance?

Many subdivisions and site condominiums are County Drainage Districts. This means that the Washtenaw County Drain Commissioner's staff will perform stormwater system maintenance and charge the costs to homeowners through special assessments. Maintenance, however, can often be more timely and cost effective when undertaken by property owner's associations. The Drain Commissioner will provide technical advice to property owners' associations free of charge, to help them plan and undertake stormwater system maintenance. You must obtain a permit from that office prior to performing any major maintenance or structural repair.

Inspect Inlet and Outlet Pipes

INLET PIPES direct stormwater from developments into stormwater ponds. Typically, there are two to three inlet pipes in a detention basin. Check the following:

- **Structural integrity** - Inspect the pipe to make sure it isn't crumbling or broken.
- **Rip rap** - Rip rap (typically pieces of stone) is placed around the pipe where it enters the basin to prevent erosion. Check for erosion around the pipe or missing rip rap.
- **Obstructions** - Inspect the pipe end to determine if sediment, dirt, or debris is obstructing the flow of water from the pipe into the basin. Minor amounts of sediment around pipe openings can be removed with a shovel and wheelbarrow, spread evenly on upland areas and seeded with turf grass.

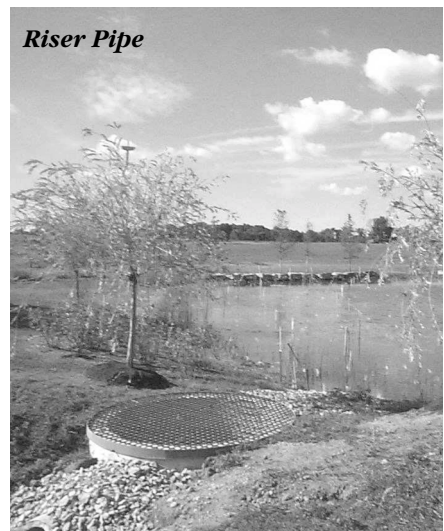
- **Riser pipes** - Riser pipes are upright pipes located near the pond outlet, usually surrounded by a "jacket" of small stone which filters out sediment and debris. The pipe is perforated, and stormwater flows through these holes to exit the pond at a controlled rate. Periodically (once every several years), the pipe must be exposed to ensure that it is free-flowing and not clogged with sediment. After any sediment and debris are removed, clean stone should be replaced around the riser pipe. This job will require the services of a contractor with appropriate equipment.

If any of these problems are occurring, or if you have questions, contact the Drain Commissioner's Office. Staff may be able to assist you directly (if the system is a county drain) or direct you to other agencies or private contractors.



OUTLET PIPES direct stormwater from a detention basin off site to a nearby creek or stream. Typically, there is only one outlet associated with a basin. The outlet generally consists of a single pipe or a riser pipe. Check the following:

- **Structural integrity** - Check the pipe to ensure that it isn't crumbling or broken.
- **Obstructions** - Inspect the pipe end to determine if sediment, dirt, or debris is obstructing the flow of water into the pipe and preventing water from leaving the basin. Stone around the outlet pipe may need to be replaced if it becomes clogged with sediment.



Inspect for Litter and Debris

Twice each year (spring and fall) and after a major storm, check for debris near the inlets, in the basin, and at the outlet. Remove and dispose of debris or litter.

Examine the Side Slopes for Erosion

Erosion



Twice each year (spring and fall) and after a major storm, check for gullies or sloughing of the banks and other disturbances from animals or vehicles. Any damage observed should be repaired immediately by filling any eroded areas with topsoil and seeding with appropriate vegetation. It is also important to place mulch or straw over the seed to prevent it from being washed into the basin. If problems continue, contact the Washtenaw County Drain Commissioner or MSU Extension Office for additional guidance and advice.

Inspect Vegetation

In the spring and fall, inspect the vegetation on the banks and in the basin. Maintenance activities will vary depending on the type of basin. If you have a pond with wetland vegetation, dead cattails and other decomposing vegetation in the basin should be re-

Vegetation Removal



moved if they are clogging pipe openings. Living vegetation greatly improves water quality by filtering out pollutants such as fertilizers, pesticides, oils and grease from the stormwater.

Late fall is a good time to cut down cattails. This will minimize clogging in the spring by dead vegetation. Cut cattails should be disposed of with other compost materials.

Remove invasive non-native plants like purple loosestrife. Al-

though its bright purple flowers are pretty, purple loosestrife forms dense colonies, crowding out native wetland plants that are important sources of nutrients for birds and other wildlife. The plant is such a problem that it is illegal to sell it in the State of Michigan.

Removal of purple loosestrife should be done before the plant sets seeds in August. Remove by pulling the entire plant out of the ground, including the roots. Dispose properly with other yard waste that is composted.

Repair bare spots along banks with turf grass seed, meadow grass or wildflowers. Native landscaping like meadow grasses and wildflowers grown along the banks of the stormwater pond will reduce long-term landscape maintenance, filter pollutants and discourage geese. Consult with professional landscape architects and nurseries to learn more about plantings, or consult with the MSU Extension Office for advice.

Mowing

Frequency of mowing required at a stormwater pond is determined by pond type and desired appearance. Maintaining a buffer of taller vegetation plantings at the stormwater pond edge filters pollutants from runoff and also discourages the nesting and visits of geese. No lawn care chemicals should be used within 25 feet of the pond. Typically, a stormwater pond planted with turf grass only needs to be mowed two or three times a year. Basins with native grasses and wildflower plantings should be mowed only once a year in the late fall or early spring. More frequent mowing will prevent the wildflowers from blooming and producing seed.

Mowing



Record Keeping

Keep records of all inspections including the date, name of inspector or maintenance contractor, observations, and maintenance activities performed. Keep records of all costs for inspections, such as consulting with professional engineers, and repair costs. Good records will help you make adjustments to the maintenance program as needed.

GETTING HELP

Washtenaw County Drain
Commissioner's Office (734) 222-6860

Washtenaw County
MSU Extension
(for stormwater pond
landscaping questions) (734) 997-1678

Stormwater Pond Maintenance Tasks and Schedule

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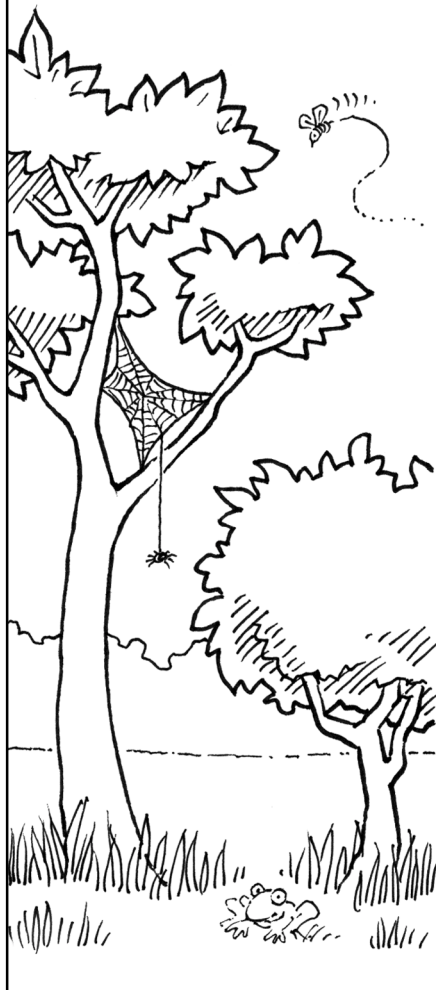
Controlling Garden Pests



Guide No. 6

Why be concerned?

Chemical pesticides are poisonous substances. Many of them are harmful to plants, pets and children, and can pollute creeks, ponds, rivers and groundwater resources. The approach of Integrated Pest Management (IPM) is an alternative to purely chemical pest control. It provides a safer, less expensive and more consistent eradication of any pest over the long term.



What is Integrated Pest Management (IPM)?

IPM recognizes that pests are an integral part of the natural system. This approach works to keep pests at tolerable levels by using cultural, mechanical and biological controls instead of chemical ones, whenever possible. IPM involves paying attention to the landscape and managing it in a way that provides optimum growing conditions for those plants desired, since healthy plants are less susceptible to pests. This includes working to eliminate conditions favorable to pests and promoting natural controls such as beneficial insects.

Chemical Pesticides: a Last Resort

In IPM, chemicals are just one small part of the whole plan. If pesticides are used, the least toxic one should be chosen and applied at the most effective time in the pest's life cycle.

Choosing Plants

Choosing the right plants is the best way to avoid pest problems. Choose plants that are naturally free of major pests and diseases, and that are well-adapted to our climate, and to the specific soil, light and moisture conditions on-site. Plants that require shade, for example, are more susceptible to pests when grown in full sun. The pH level of soil can also affect a plant's ability to withstand pests.

For help identifying the plants best suited for your purposes and site, contact the MSU Extension (see "Getting Help"), a local nursery, or a landscape architect.



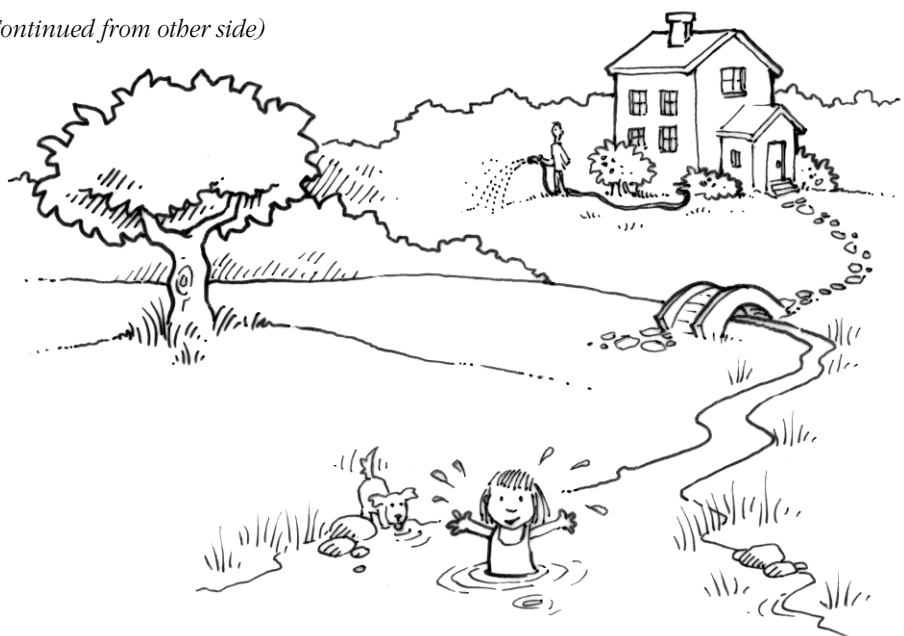
Keeping Plants Healthy

Weeds, pests and diseases are usually the *result* of poor growing conditions and unhealthy plants, not the *cause* of them. To keep plants healthy, use good horticultural techniques. Maintaining healthy soil conditions is the foundation of any IPM program:

- Space, thin and prune shrubs and trees to promote air circulation.
- Plant seedlings after the threat of frost and before hot weather.
- Maintain a variety of plants instead of only one or two species, to minimize the spread of diseases.
- Aerate and add organic matter to the soil.
- Water and fertilize plants only as needed.
- Mow grass as high as possible and leave clippings on the lawn.

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Protecting Sensitive Areas

Consider whether the site is near a water body, stormwater pond, vegetable garden, children's play area, or public place. If it is, select a pest management technique that minimizes harm to these sensitive areas. The wise use of pesticides protects water quality in ponds and streams. If used near lakeshores or streambanks – even in modest amounts – lawn chemicals may quickly find their way into the water.

The Secrets of Chemical-Free Pest Control

Use methods of pest control that are the least disruptive to human health and the environment.

Plant Selection

Select disease- and pest-resistant plant varieties. Consult with the MSU Extension Office or a professional landscape architect or nursery for help in plant selection.

Low Cost / Simple Control Methods

Simple methods to control pests include:

- removing weeds by pulling or hoeing;
- covering planting areas with 2"-3" of mulch to prevent weed germination;
- removing pest-infested plant residue in the fall; and
- removing insect eggs, larvae, cocoons, and adults from plants by hand.

Retain and Promote Natural Pest Controls

Many organisms feed on, or infect, pests. These natural enemies frequently prevent the pest population from reaching damaging levels. Natural enemies include insect and non-insect predators, parasites, and bacterial, fungal and viral pathogens. Contact the MSU Extension Office for more information (see "Getting Help").

Managing Gypsy Moths

Gypsy moth outbreaks have been identified in Washtenaw County. There is no need for alarm, however, since the moths can be managed and do not typically kill trees. Homeowners are encouraged to learn more about this pest. For more information, contact the MSU Extension Office (see "Getting Help" below).

Natural Enemies

Common garden pests include grubs, aphids, scale insects, mealybugs and whiteflies. Populations of these insects may be kept in control by natural enemies such as predatory bugs and other animals. Lady beetles (or "ladybugs") and lacewings, for example, feed on aphids. Robber fly larvae can substantially reduce grub populations in the soil. Garden spiders capture insects in their webs and kill their prey by injecting them with venom. Birds, frogs, and toads, and small mammals such as mice, shrews and moles also help control insect populations.



You can help encourage these natural enemies of garden pests by minimizing or avoiding use of chemicals that are poisonous to all insects and insect feeding animals.

GETTING HELP

Washtenaw County
MSU Extension (734) 997-1678



Landscaping Near the Water's Edge

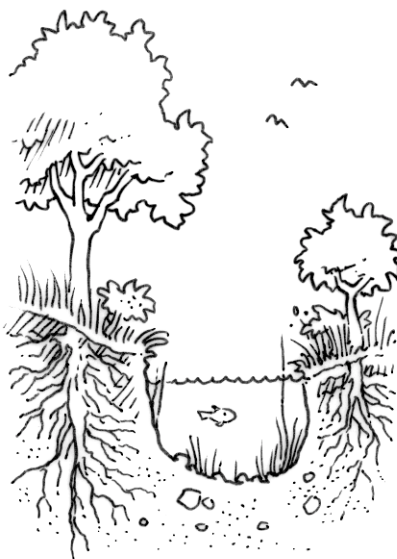
Guide No. 7



Why be concerned?

A zone of trees and other plants growing at the water's edge help keep water pure, cool and clean. Vegetative buffers, or riparian areas, provide shade, filter pollutants, prevent erosion and reduce sedimentation.

In contrast, grassy buffers offer little protection to shorelines and stream banks. Their comparatively shallow roots are less effective at infiltrating runoff and preventing erosion - both major problems locally.



Lastly, riparian areas provide wonderful backyard habitat, and discourage nuisance geese. For more information, see the National Wildlife Federation and Wisconsin DNR web sites in the "Getting Help" section.

What's "Native"?

According to the Ann Arbor City Parks Natural Areas Preservation Program, 'native' refers to plant communities that were here before Europeans settled Michigan in the 1700's. Since then, thousands of plants have been introduced and have become naturalized in North America at an unprecedented rate and scale.

'Naturalized' refers to non-native, or alien species, that have been introduced over time. Once introduced, some non-natives are difficult to control because they have no natural enemies.

Approximately 30% of the 2,600 plant species growing in Michigan are non-natives that have become naturalized, largely over the last hundred years.

Landscaping Near the Water's Edge

Landscaping designs next to waterways and stormwater ponds protect and enhance riparian vegetation to benefit homeowners, wildlife and water quality. When thinking about re-landscaping riparian areas, consider these factors:

- Planned use of the landscape
- Aesthetics
- Long-term maintenance.

Use - Typically, the backyard is the most actively used outdoor area at home. Often the total area available for different uses is relatively small, and wise use of space is a necessity.

Aesthetics - Views from the home and backyard are another factor to consider in landscape design. Many people value the views of an adjacent stream and want access to the water's edge. Views can be directed by sensitive placement of trees and shrubs in relationship to viewing points, such as windows, outdoor paths and patios.

Maintenance - Traditional grass lawns provide an ideal surface for many outdoor activities and permit open views, but they also require regular maintenance with correspondingly little benefit to the environment.

Adding Vegetation to the Banks

Planting a variety of shrubs and wildflowers along the banks of streams and stormwater ponds can promote bird habitat and provide seasonal color and interest. Many varieties of wetland shrubs and wildflowers grow well in damp soil. Several native trees have also adapted to grow near water.

As an alternative to cattails, wetland plants such as softstem and hardstem bulrush, blue flag iris, woolgrass, water plantain, pickerel weed and arrowhead can be planted in stormwater pond areas. (If landscaping near a stormwater basin, please remember to leave room for maintenance vehicles. Contact the Washtenaw County Drain Commissioner's Office for information.)

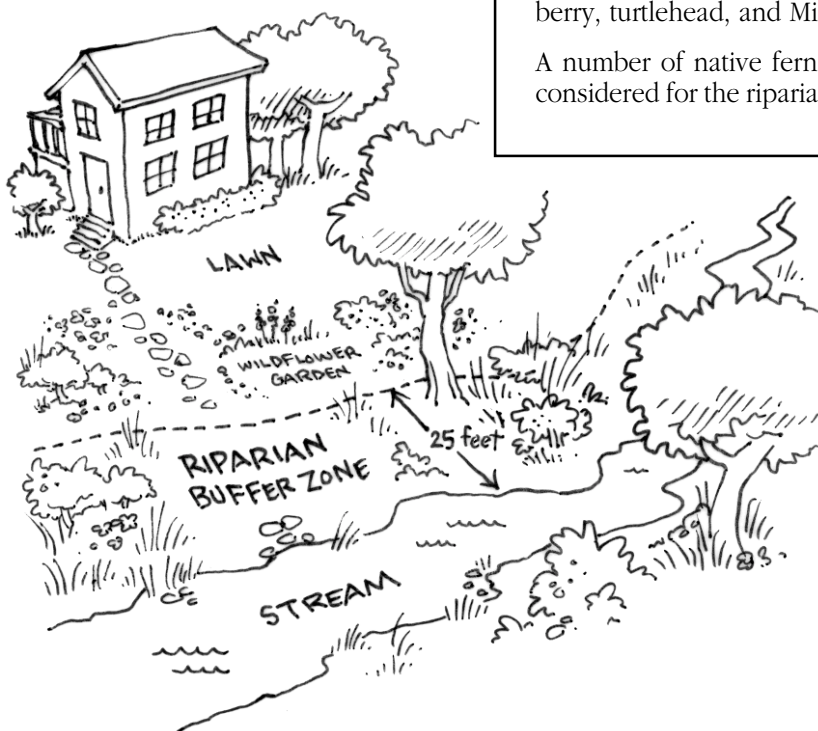
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Nurseries that specialize in wetland plants are increasing in number. For more information, contact the MSU Extension Office for Washtenaw County or Wild Ones in the "Getting Help" section.

Landscape Zones

A Landscape Zone plan can be drawn in a simple way to visualize how a residential property that borders a waterway can be designed by use, views and desired maintenance levels. The example below illustrates how a variety of uses and scenic views of the adjacent stream can be accommodated while maintaining or enhancing the riparian buffer zone.



Native Michigan Plants to Consider Planting Near Water

Trees: green ash, swamp white oak, tuliptree, black walnut, sycamore, silver maple and red maple.

Understory Trees and Large Shrubs: alternate-leaf dogwood, redbud, serviceberry, nannyberry viburnum, American hazelnut and black chokeberry.

Shrubs: red-osier dogwood, silky dogwood, buttonbush, common elder and black raspberry.

Wildflowers and Groundcovers for Shade: blue cohosh, mayapple, wild ginger, bloodroot, jack-in-the-pulpit, trillium, wild geranium, woodland phlox, marsh marigold and Dutchman's breeches.

Wildflowers for Sunny Wet Areas: New England aster, joe-pye-weed, boneset, ironweed, cardinal flower, and swamp milkweed.

Wildflowers for Sunny Dry Areas: blazing-star, beebalm, black-eyed susan, yellow coneflower, stiff goldenrod, showy goldenrod, wild strawberry, turtlehead, and Michigan lily.

A number of native ferns, grasses, rushes and sedges should be also be considered for the riparian zone. See "Getting Help" for more information.

Planting Tips for Riparian Buffers

- Retain existing or plant new native trees, shrubs, grasses and wildflowers along the water's edge.
- The width of the vegetated buffer zone is likely to be influenced by many factors; ideally, the zone should be at least 25 feet in width.
- Many communities have adopted ordinances and regulations requiring buffer zones of varying widths. Contact township or city officials for more information.
- Choose plants that are compatible with site conditions (soil type, pH, sun exposure, etc.)
- Avoid selecting non-native plants because they typically require more chemical use to sustain their health.

GETTING HELP

Washtenaw County
Drain Commissioner (734) 222-6833
Washtenaw County MSU Extension (734) 997-1678

Web Sites:

Washtenaw County www.co.washtenaw.mi.us
Wild Ones www.for-wild.net/annarbor
National Wildlife
Federation www.nwf.org/habitats/index.html
Wisconsin DNR www.dnr.state.wi.us/org/water/fhp/fish/pubs/thewatersedge.pdf



Rethinking Yard Care

Guide No. 8



Why be concerned?



The amount of space taken up by lawns in the U.S. is about the size of Pennsylvania. Mowed, manicured and irrigated lawns, unlike native prairies, are not natural. This is why it takes so much energy to keep them alive.

Yard care may be a very rewarding pastime for some, but an unwanted chore for others. In addition to the time commitment, many homeowners frequently rely on chemical products to maintain their lawns and grounds. These products can work well if applied correctly, but too much can be unsafe for children, animals, and fish.

Reducing lawn size, using lawn care products carefully, and conserving water will help maintain the look, while promoting a safe and healthy environment.

The Natural Processes

Ever since the lawnmower was invented, lawns have become the 'accepted look' that says a neighborhood is safe, tidy and cared for. However, there are many important reasons to have as small a mowed lawn as possible.

An estimated 70 percent of pesticide use in the United States occurs on our nation's lawns. Lawns provide little wildlife benefit, are a source of water pollution (erosion and chemicals), and can be visually bland.

Manicured, irrigated, and vitamin enriched lawns do not take advantage of the natural processes that we associate with the great outdoors. In nature, soil organisms decompose leaves and vegetation; plants then recycle these nutrients to produce new growth. Over time, leaf litter builds up in the top layer of soil. This organic matter moderates temperature, retains water and nutrients more efficiently, and reduces polluted runoff.

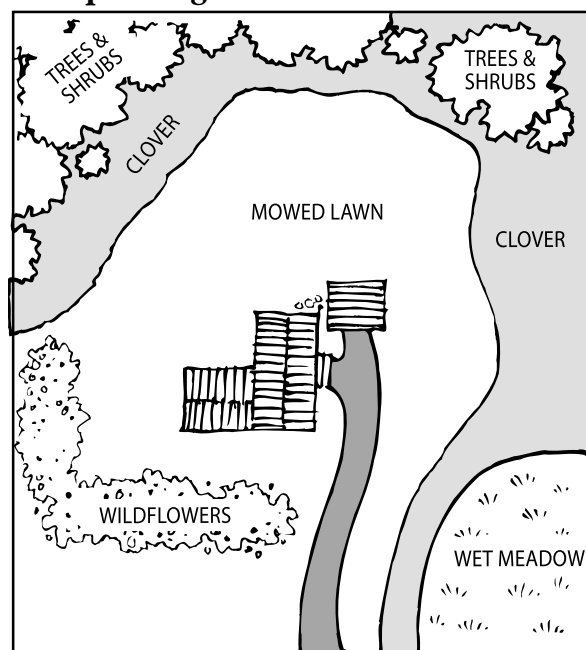
We cannot expect these processes to be duplicated everywhere, but if you enjoy working outdoors, there are many ways to reintroduce nature's magic into to your landscape.

Does your lawn have an area that often seems wet? Often these spots can be restored to a wet meadow or wildlife pond. Throughout the yard, landscaping that includes shrubs, wildflowers, and prairie grasses can add beauty and improve water quality. This is especially important for waterfront property.

If you have 'wild' areas on your property, consider maintaining this natural state instead of converting them to lawn. Natural landscapes often require less time and money than formal landscapes.

How much lawn you need depends on the size, shape, and uses of your property. If you need space for playing ball or exercising a dog, a long rectangular area may suffice. However, if the only activity on portions of your lawn is mowing, consider converting those areas to wildflowers, or locally occurring plants, which are better rooted in the natural world.

Incorporating Natural Areas in Your Yard



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Beware of the "Dangerous Diet"!

Use of yard care chemicals has become so routine that a "healthy respect" for their proper application has diminished. Even well-intentioned use of fertilizer and pesticides can do more harm than good.

When confronted by lengthy directions and warnings in fine print, it's tempting to skip the instructions on chemical labels and just "get the job done." Remember the suffix "icide" means "to kill." While more target-specific and improved products are continually developed, the fact remains that pesticides sometimes kill things other than their targets.



When using pesticides, a careful diagnosis of the problem and conservative application procedures are critical. Diagnose the problem, follow application directions and resist the urge for a quick chemical solution. The key is an understanding of the targeted pests and the chemicals you plan to use. If you need help, there are several sources of information in the "Getting Help" section. Also, consider the use of more natural alternatives. Informed homeowners can select safe and reliable chemical treatments for specific yard care problems.

TIPS FOR A SAFER LAWN

1. Test Soil Compaction - Compacted soils are unhealthy for plants and can generate as much runoff as pavement. Try sinking a screwdriver into the ground. If it doesn't penetrate easily, consider aerating your lawn.

2. Leave Grass Clippings on the Lawn - Clippings left on the lawn provide important moisture and nutrients. Up to half the nitrogen needed by your lawn can actually be provided by these clippings. If your lawn grows quickly, consider collecting some of the clippings to use as mulch or in compost.

3. Compost Yard Waste - Composting keeps yard waste and other decomposable materials out of landfills. Composting also creates a rich material that can be used in flowerbeds or on the lawn to aid in growth.

4. Fertilizers and Pesticides

- Before applying any fertilizer to your lawn, have your soil tested by Washtenaw County MSU Extension or your landscape contractor. Based on the results, you will know the exact type and amount of fertilizer your soil needs.
- Knowing the size of your lawn will help in correctly applying the recommended amount of fertilizer.
- One Fall application of low phosphorus fertilizer is adequate to promote a green flush next spring.
- Slow release fertilizers will last longer and reduce polluted runoff. Look for Water Insoluble Nitrates (WIN) in the list of ingredients.
- Buy only what you need. Time and freezing garage temperatures can render stored products less effective without reducing their hazardous qualities. As yard care chemicals pile up, proper storage and disposal can be difficult. Curious children and pets may also be at risk.
- Chemicals spilled on pavement during mixing and loading will wash off into local waterways with the next rainstorm. Mixing and loading away from pavement greatly reduces this risk.
- Many of the rates recommended on labels are generous and designed so that products remain effective under less optimal conditions. Do not exceed recommended application rates.
- Under-application of yard care chemicals can also create problems. Remember that pest populations subjected to non-lethal doses may begin to develop resistance to the chemicals designed to kill them.
- Do not apply chemicals within the last few feet of grass along a driveway, sidewalk or swale. The next rainfall will wash a good portion of these pellets into the nearest creek.

It really doesn't matter where you live or whether you have a little or a lot of time and money to invest in your yard; there are many things you can do to conserve water and improve water quality. Conserving water saves money, protects watersheds, and helps keep groundwater tables high. The ideas found on this and the following page highlight some of the ways that you can contribute to clean water and a healthy environment.

An Old Idea Reconsidered

Do you remember the rain barrel from years ago? Consider its simple purpose: to collect rainfall from a roof and store it to water flowers and garden plants when the weather turns dry.

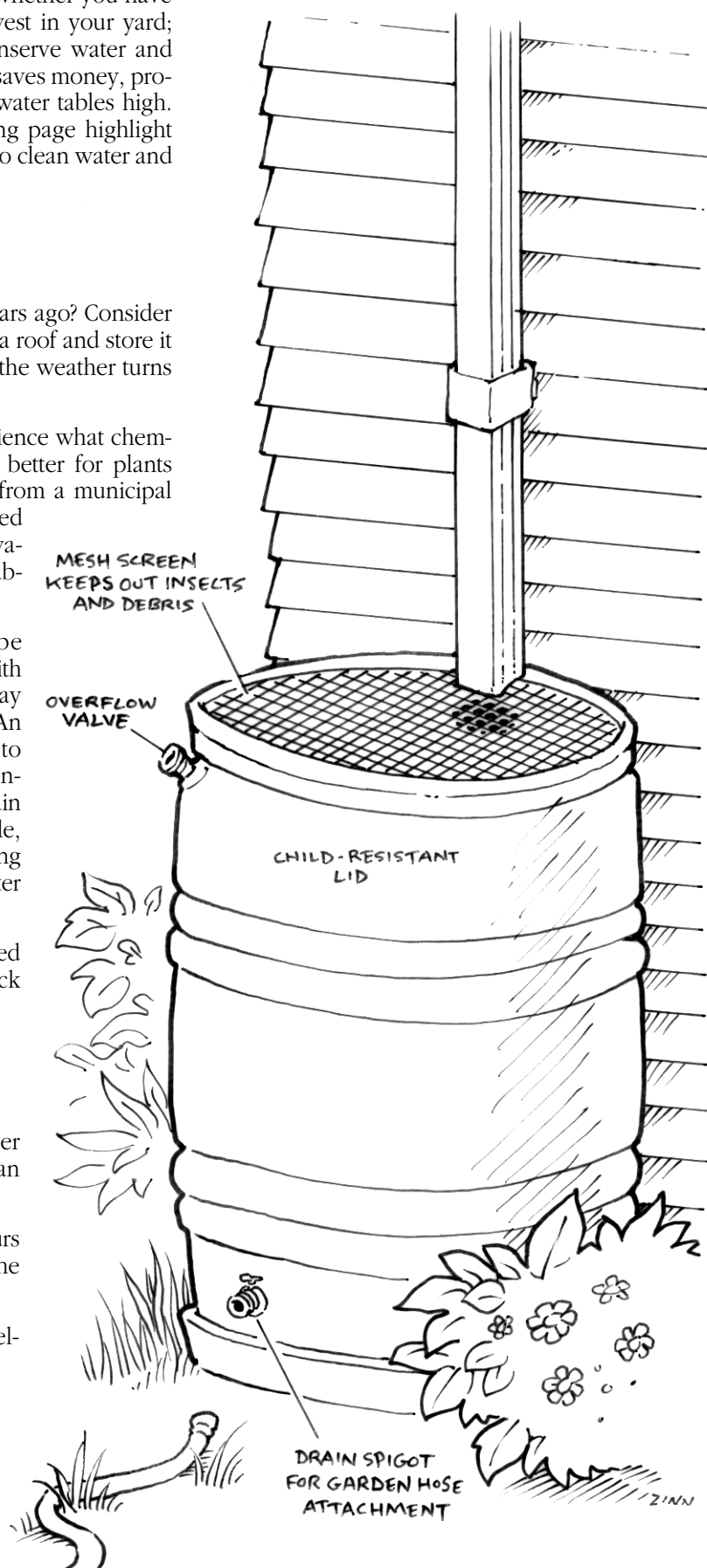
Gardeners of past years knew from experience what chemistry teaches us today: rainwater can be better for plants than water pumped from the ground or from a municipal source since it is not chlorinated, fluoridated or loaded with dissolved salts. Also, rainwater is mildly acidic, which helps plants absorb important minerals from the soil.

The rain barrel you choose should be equipped with a drain spigot compatible with garden hose threading so that rainwater may be directed to drip irrigation systems. An overflow outlet for the barrel is necessary to provide bypass runoff during major rainstorms. It is important to note that your rain barrel must be designed with a removable, child resistant cover and mosquito screening on water entry holes. Remember that water from rain barrels is not potable.

The rain barrel can be attractively included in landscaping plans for patio and deck designs.

Other Water Saving Tips

- Lawns generally need an inch of water per week. A rain gauge (or tuna fish can) can help keep track.
- Water lawns during the early morning hours when temperatures and wind speed are the lowest.
- Drip irrigation and soaker hoses are excellent water-efficient irrigation methods.
- If you have an automated sprinkler system, install a rain sensor that shuts it off after a .25 inch rain.



Native Plants of Michigan

COMMON NAME	SCIENTIFIC NAME	SITE/SOIL	SUN AVAILABILITY	OTHER NOTES
American Elderberry	<i>Sambucus canadensis</i>	Mesic woodlands; savanna grasses are often part of this community.		Native shrub
American Hazelnut	<i>Corylus americana</i>	Oak savanna site.		Native shrub
Basswood	<i>Tilia americana</i>	Mesic woodlands; savanna grasses are often part of this community.		Native tree
Big Bluestem Grass	<i>Andropogon gerardii</i>	All textures of soils except organic; all drainage conditions.	Full sun grass	Woodland Community
Black Oak	<i>Quercus velutina</i>	Oak savanna site.		Native tree
Bloodroot	<i>Sanguinaria canadensis</i>		Best for shaded areas	Native perennial; suitable for use as groundcover.
Bottle Brush Grass	<i>Hystrix patula</i>		Full sun/part shade area	Native grass
Bur Oak	<i>Quercus macrocarpa</i>	Oak savanna site or mesic woodlands where savanna grasses are often part of the community		Native tree
Butterfly Milkweed	<i>Asclepias tuberosa</i>		Full sun/part shade area	Native perennial
Canadian Wild Rye	<i>Elymus canadensis</i>	All textures of soils except organic; all drainage conditions.	Full sun/part shade area	Native grass
Dark-green Bullrush	<i>Scirpus atrovirens</i>	Organic soils; somewhat poorly drained or poorly-drained soils without artificial drainage		Best suited for marshy soils which provide wet conditions.
Dutchman's Breeches	<i>Dicentra cucullaria</i>		Best for shaded areas	Native perennial
Grey Dogwood	<i>Cornus racemosa</i>	Mesic woodlands where savanna grasses are often part of the community		
Hackberry	<i>Celtis occidentalis</i>	Floodplain forest area		Native tree
Indian Grass	<i>Sorghastrum nutans</i>	Sand, loamy sand, sandy loam, loam, silt loam, and clay loam textures; well and moderately well drained soils.	Full sun grass	Native grass
Junegrass	<i>Koeleria macrantha</i>	oak savanna community		Native grass
Little Bluestem Grass	<i>Andropogon scoparius</i>	oak savanna community	Full sun grass	Native grass
May Apple	<i>Podophyllum peltatum</i>		Best for shaded areas	Native perennial
New Jersey Tea	<i>Ceanothus americanus</i>	Oak savanna community		Native shrub
Pennsylvania Sedge	<i>Carex pennsylvanica</i>	Sand, loamy sand, sandy loam, loam, silt loam, and clay loam textures; well and moderately well drained soils.		Native sedge; suitable for use as groundcover
Prairie Cord Grass	<i>Spartina pectinata</i>	Wet conditions are favorable; usually found in wet prairie	Full sun grass	Native grass
Purple Love Grass	<i>Eragrostis spectabilis</i>	Oak savanna community		Native grass
Red Oak	<i>Quercus rubra</i>	Mesic woodlands where savanna grasses are abundant		Native tree
Rough Blazing Star	<i>Liatris aspera</i>	Oak savanna community		Native perennial
Shagbark hickory	<i>Carya ovata</i>	Mesic woodlands where savanna grasses are often found; oak savanna.		Native tree
Silver Maple	<i>Acer saccharinum</i>	Floodplain forest		Native tree
Swamp White Oak	<i>Quercus bicolor</i>	Mesic woodlands where savanna grasses are abundant		
Switchgrass	<i>Panicum virgatum</i>	Sand, loamy sand, sandy loam, loam, silt loam and clay loam textures; well and moderately well-drained soils	Full sun grass	Native grass
Trillium	<i>Trillium grandiflorum</i>		Best for shaded areas suitable for use as	Native perennial; groundcover
White Oak	<i>Quercus alba</i>	Oak savanna; Mesic woodlands where savanna grasses are often abundant		Native tree
Wild Geranium	<i>Geranium maculatum</i>		Best for shaded areas	Native perennial
Wild Ginger	<i>Asarum canadense</i>		Best for shaded areas	Native perennial

Native Wetland Plants of Michigan

COMMON NAME	SCIENTIFIC NAME	SITE/SOIL	SUN AVAILABILITY	OTHER NOTES
Beggar-Ticks	<i>Bidens frondosa</i>	Moist, open ground, stream banks and roadsides		Provides food and cover for ducks.
Button Bush	<i>Cephalanthus occidentalis</i>	Low wet ground, swamps, bogs, and lake edges.		Good source of nectar
Common Boneset	<i>Eupatorium perfoliatum</i>	Soil provides generally wet conditions often marshy area.		Native perennial
False Solomon's Seal	<i>Smilacina racemosa</i>	Woods and shaded edges; moist soil	Partial to full shade	Decorative
Golden Alexanders	<i>Zizia aurea</i>	Wooded bottomland, stream banks, moist meadows, and floodplains.		
Marsh Marigold	<i>Caltha palustris</i>	Calcareous wet soil communities; fens.		Native perennial
Nannyberry	<i>Viburnum lentago</i>	Woods, swamps, roadsides.		
Northern Arrow-Wood Viburnum	<i>Viburnum recognitum</i>	Swamps, boggy woods, swampy pastures and stream banks		
Obedient Plant or False Dragonhead	<i>Physostegia virginiana</i>		Full sun/part shade forb	Native perennial
Red-Osier Dogwood	<i>Cornus stolonifera</i>	Swamps, moist fields and thickets		
Silky Dogwood	<i>Cornus amomum</i>	Moist woods, meadows, old fields, and swamps.		Fruit are an excellent source of food for wildlife
Smooth Aster	<i>Aster laevis</i>		Full sun/part shade forb	Native perennial
Solomon's Seal	<i>Polygonatum pubescens</i>	Wooded slopes and stream banks		Decorative plant
Southern Arrow-Wood Viburnum	<i>Viburnum dentatum</i>	Swamps, wet woods, and open wetlands.		
Spiderwort	<i>Tradescantia ohiensis</i>		Full sun/part shade forb	Native perennial
Spotted Joe Pye Weed	<i>Eupatorium maculatum</i>	Generally marshy, wet conditions		Native perennial
Sugar Maple	<i>Acer saccharum</i>	Mesic woodlands where savanna grasses are abundant		Native tree
Swamp Milkweed	<i>Asclepias incarnata</i>	Marshy, wet conditions		Native perennial
Turtlehead	<i>Chelone glabra</i>	Calcareous wet soil communities; fens.		Native perennial
Tussock Sedge	<i>Carex stricta</i>	Sand, loamy sand, sandy loam, loam, silt loam and clay loam textures; well and moderately well-drained soils		Native sedge; generally found in wet conditions.
Virginia Wild Rye	<i>Elymus virginicus</i>	All textures of soils except organic; all drainage conditions	Full sun/part shade grass	Native grass
Wild Bergamot/ Bee-balm	<i>Monarda fistulosa/ didyma</i>		Full sun/part shade forb	Native perennial
Winterberry	<i>Ilex verticillata</i>	Swamps, bogs, moist woods, and wet shores.		

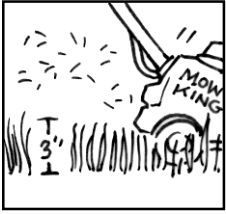
The following publications may be helpful regarding wetlands plantings and are available from the Washtenaw County MSU Extension (734) 971-0079:

“Water Front Buffer Zones”, MSU Cooperative Extension Service.

“Working with Wet Areas in the Landscape”, Harold Davidson, Department of Horticulture, MSU.

“Shoreline Plants and Landscaping”, A series of water quality fact sheets for residential areas, University of Wisconsin Extension in cooperation with the Wisconsin Department of Natural Resources.

More Ideas for Around Your Home:



- Mow often enough to leave grass clippings on the lawn. Mow the lawn high – at least three inches. Alternatively, use clippings as mulch or compost them along with leaves that might otherwise end up fertilizing local waters.



- Keep fallen leaves out of the streetside gutter or swale. Consider using a “mulching” mower and using the mulch around the yard.

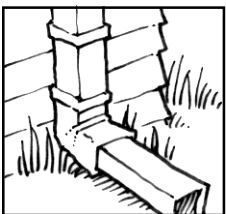


- Plant that extra tree for many environmental benefits, especially where it becomes part of a planting bed or “naturalized” landscape area that recycles leaves, twigs, and other yard “wastes.”



- Consider native plants when planning landscaping purchases.

- Seed bare soil and cover it with a mulch as soon as possible to minimize erosion. Disturb no more soil than necessary for a project and consider native grown covers instead of lawn turf while preserving existing vegetation.



- Direct roof downspouts away from foundations and driveways to planting beds or lawns where water can safely soak into the ground. Consider using a rain barrel if practical.



- Use lawn and garden chemicals carefully and sparingly. Pesticides, including weed killers, should be considered as a last resort – use other, more natural controls first.

- Limit the use of toxic or hazardous products in general, especially keeping them away from storm drains, lakes and streams.



- Collect used oil and other automotive products for recycling.



- Wash cars on the lawn, where cleaning products can't quickly run toward the nearest storm sewer, picking up other pollutants as they go. Wash your car with plain water.

- Keep cars and equipment tuned up and in good operating condition. Check for drips and repair leaks immediately to keep nuisance oils and fluids off pavement.



- For waterfront property, grow a “buffer strip” of dense, natural vegetation along the water's edge as a last defense to filter pollutants from the water and stabilize the shoreline.

- If using a septic tank system, maintain it properly through regular professional inspections and licensed pumping.

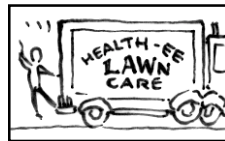


- Plan your landscape with environmental health in mind, reducing the area that requires extensive maintenance.



- Clean up pet wastes. Otherwise, nutrients and bacteria could be washed into lakes and streams.

- Use deicers conservatively in winter.



- Contract services who agree to provide maintenance services in keeping with water quality protection practices.

GETTING HELP

Washtenaw County Drain Commissioner's Office (734) 222-6860

Washtenaw County MSU Extension (734) 997-1678

Ann Arbor City Parks Natural
Areas Preservation Program (734) 996-3266

MDNR website: www.dnr.state.mi.us/



Prescription Drug and Personal Care Product Disposal

Guide No. 9

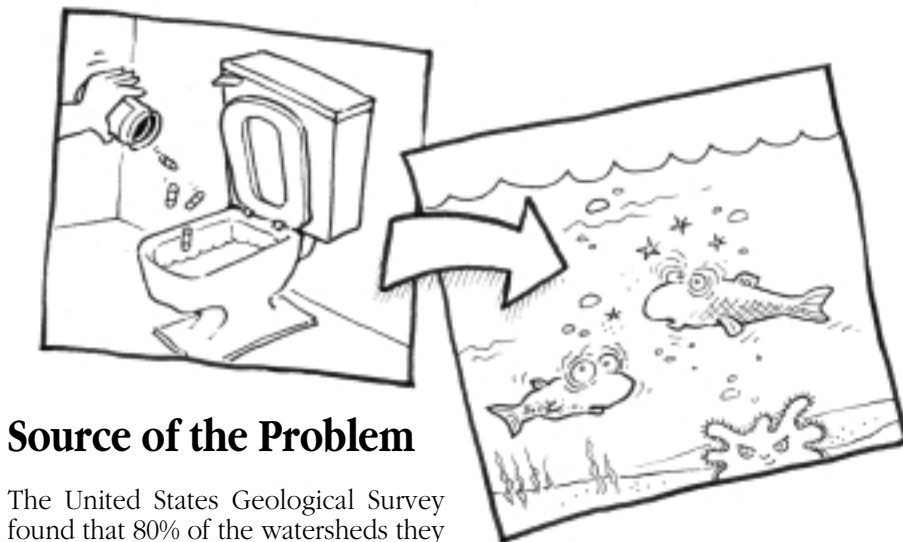


Why be concerned?

Increasing amounts of prescription drugs and personal care products (PPCPs) are being detected in U.S. rivers, waterways, and groundwater.

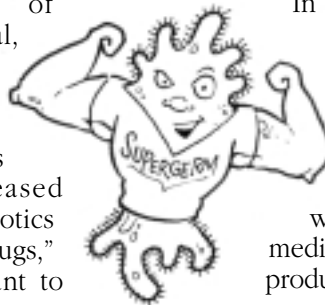
Wastewater treatment facilities are not equipped to “filter out” these chemicals, so drugs like cholesterol reducers, blood pressure medication, sleeping pills, hypnotics, hormone replacement therapy, and antibiotics are being detected in drinking water supplies.

These medications endanger aquatic life in waterways all across the country. The risk to humans and animals of long-term exposure to these contaminants in drinking water is unknown.

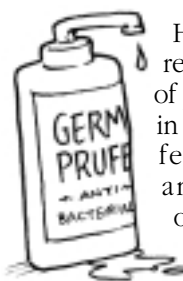


Source of the Problem

The United States Geological Survey found that 80% of the watersheds they sampled nationally contained at least one type of pharmaceutical chemical, with half of the streams containing seven or more. While most of the effects of these products are unknown, increased concentrations of antibiotics have produced “super bugs,” bacteria that are resistant to antibiotics.



In the United States there is no national guidance for the proper disposal of PPCPs. However, there are measures you can take at home to prevent the contamination of waterways from unused medication and personal care products.



Human excretion is responsible for the majority of pharmaceutical pollution in our waterways. Animal feedlots also release antibiotics from waste outflows after storms.

Antibiotics from cleaning products end up in local streams as well. However, a significant portion of the pollution is a result of the improper disposal of unused drugs and personal care products.

Previous information campaigns encouraged consumers to “flush” excess pharmaceuticals because of the potential harm they posed to children when left in the home or placed in household trash.



STEPS FOR SAFE DISPOSAL OF PPCPs

If you are instructed to do so by your physician, finish the prescription. For any unused portions, follow the steps below. Remember to first remove or black-out any personal information on the label to protect privacy, but ensure the drug name is still visible.

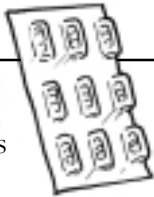
Capsules and Tablets in Containers

- Secure the cap on the bottle.
- Cover top with duct tape, fully sealing the container to prevent breaking or leakage.
- Double wrap the sealed containers in opaque plastic bags. Tightly tie or secure the bags to prevent leakage and place in trash.



Blister-Packaged Capsules and Tablets

- Wrap package with several layers of duct tape, allowing visibility of the product name. This will prevent blister packs from breakage.
- Double bag the sealed packs in opaque plastic bags. Secure the bags to prevent leakage and place in trash.



Liquid PPCPs

- Seal the container with duct tape to prevent leaks and breakage.
- Double bag in opaque plastic bags and place in the trash. Carefully seal the bag to prevent leakage.
- To take further precautions, add salt, a pungent spice such as nutmeg or mustard, or a bitter tasting additive. Kitty litter, sawdust or an absorbing agent can also be added to the liquid to repel animals. Then double bag in a tightly sealed opaque plastic bag and place in the trash.



Ampules, Vials, and Needles

- Do not open or alter the original contents if possible.
- Call the Washtenaw County 24 hour home toxics hotline (734) 222-3950 for information and drop off hours at 705 N. Zeeb Road. Also check the *Turning Trash to Treasure* guide on www.ewashtenaw.org for a pharmacy drop off location near you.
- Residents outside Washtenaw County should call their Solid Waste Department or Waste Hauling Services for instructions on proper disposal.



Prescription Drugs

- At present there are few, if any "take back" programs for prescription drugs.
- Call your local pharmacy to confirm information on the disposal of prescription drugs.

GETTING HELP

Washtenaw County Drain Commissioner's Office.....(734) 222-6833
or (734) 994-2525

Washtenaw County Home Toxics Program.....(734) 222-3950

Michigan Department of Environmental Quality.....(800) 662-9278

See the Washtenaw County website at www.ewashtenaw.org