

# **BACKYARD CONSERVATION PROGRAM**

**SIMPLE STEPS YOU CAN TAKE IN YOUR OWN YARD  
TO REDUCE POLLUTION IN OUR RIVERS AND STREAMS**



**SUMMER 2008**

**FRIENDS OF THE LOWER OLENTANGY WATERSHED**

# **FLOW!**

**WELCOME TO THE BACKYARD CONSERVATION PROGRAM.**

The purpose of this program is to reduce the impact of stormwater runoff in the Lower Olentangy Watershed by educating residents on conservation practices that they can implement in their own backyards. The program includes opportunities for conserving water; using native plants; improving habitat for birds and butterflies; and reducing fertilizers, pesticides, and other pollutants. The end goal is to protect and improve water quality in the Olentangy River Watershed, the place where we live.

The Backyard Conservation Program is a project of Friends of the Lower Olentangy Watershed (FLOW) and the Franklin Soil and Water Conservation District (FSWCD). The project is made possible by grants from the Clifford and Mary Ozias Conservation and Forestry Fund of The Columbus Foundation; The Ohio Environmental Education Fund; and The City of Columbus Department of Public Utilities.

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**Friends of the Lower Olentangy Watershed (FLOW):** our mission is to increase public awareness of the extensive recreational, cultural, historical, and environmental resources of the Lower Olentangy Watershed; promote responsible policies and uses of the Olentangy River; and implement actions that will benefit the river, its watershed, and its inhabitants. ([www.olentangywatershed.org](http://www.olentangywatershed.org))

**Franklin Soil and Water Conservation District (Franklin SWCD):** our mission is to promote responsible land use decisions for the conservation of soil and water resources by providing information assistance through effective partnering, technical guidance, and education. ([www.franklinswcd.org](http://www.franklinswcd.org))

**The Columbus Foundation: the Center for Charitable Giving** ([www.columbusfoundation.org](http://www.columbusfoundation.org))

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**The City of Columbus Department of Public Utilities** (<http://utilities.columbus.gov/dpu/utilities>)

# THE LOWER OLENTANGY WATERSHED:

## WHAT IS A WATERSHED?

A watershed is a drainage basin for a specific region of land. All rainfall within a watershed will drain to the same body of water (stream, river, pond, lake, or ocean). For example, the Olentangy Watershed is the area of land that drains to the Olentangy River. Because the Olentangy drains to the Scioto, the Olentangy Watershed is also part of the Scioto Watershed, which is part of the Ohio River Watershed, and eventually the Mississippi Watershed. No matter where you live, you are in a watershed.

## WHERE IS THE LOWER OLENTANGY WATERSHED? (see map on page 14)

If you are taking this class, chances are good that you live in the Lower Olentangy River Watershed, which covers approximately 150 square miles of land in Delaware (118 square miles) and Franklin Counties (32 square miles). All the land in the watershed drains to the Lower Olentangy River, which extends 32 miles from the Delaware Dam in Delaware County to the Olentangy River's convergence with the Scioto River in the city of Columbus.

## WHY CARE ABOUT THE RIVER?

Rivers are a source of life, providing public drinking water as well as habitat for fish, amphibians, insects, and wildlife. The Lower Olentangy River is home to endangered, threatened, and special interest species of aquatic life. Rivers also offer recreational activities such as fishing, canoeing, hiking, bird watching, and enjoying nature. The Olentangy River provides all these opportunities and more, including the Olentangy Multi-Use Trail and valuable green space for our urban area. However, our river suffers the effects of urbanization as the Columbus area continues to grow. That is why FLOW works together with various agencies, local municipalities, residents, and other stakeholders to protect and improve the quality of the river.



## WHAT IS STORMWATER RUNOFF AND WHY SHOULD WE BE CONCERNED?

Stormwater runoff is the leading cause of degradation to Ohio's waterways, which include our Olentangy River. As rain falls into the watershed, it begins to soak into the soil. When the ground becomes saturated, the excess stormwater flows across the landscape. In urban areas, excessive impervious surfaces exacerbate the problem of stormwater runoff because they prevent the water from soaking into the ground. Impervious areas include hard surfaces such as roofs, sidewalks, parking lots, driveways, pavement, and even compacted soil. Instead of soaking into the ground, the stormwater runoff picks up contaminants from yards and impervious surfaces. These pollutants include automotive fluids, road dirt, fertilizers, pesticides, pet waste, and erosion sediments. Eventually, the stormwater runoff carrying the contaminants flows into the city's storm sewers and then directly into the Olentangy River without ever being treated.

## WHAT CAN WE DO TO REDUCE THE PROBLEMS ASSOCIATED WITH STORMWATER RUNOFF?

Stormwater cannot be completely eliminated, but we can minimize its effects through stormwater management techniques that include backyard conservation practices. There are many simple things we can do at home and in our yards that reduce the quantity of pollutants or the stormwater runoff getting into our waterways. In the following pages, we will discuss various backyard conservation practices that you can try at home. We hope you find them helpful and beneficial. Feel free to contact us with any questions, comments, or feedback.

# REDUCING POLLUTANTS IN STORMWATER RUNOFF

## HOUSEHOLD CONTAMINANTS

Managing potential household contaminants can greatly reduce the amount of pollutants that enter our waterways. Potential household contaminants that can be picked up by stormwater runoff include household chemicals, yard waste, pet waste, automobile and mechanical fluids, litter, pesticides and fertilizers.

### HOUSEHOLD CHEMICALS

- Minimize salt in water softener. Municipal wastewater treatment plants cannot remove these salts which, in large quantities may be toxic to certain aquatic animals.
- Make sure potentially harmful chemicals such as paints and pesticides are stored in waterproof containers, out of reach from stormwater runoff. These materials can be disposed of in the trash or through hazardous waste collection days in your community. Check with SWACO for instructions on specific chemicals.



### YARD WASTE

- Dispose of yard waste properly. Make sure yard litter such as leaves and twigs isn't getting washed into storm sewers or local streams where it can reduce available oxygen for fish and other aquatic life. Yard waste can also contribute to potential flooding downstream. Make use of your yard waste: Recycle leaves and grass in your compost pile! Or contact your officials about their yard waste collection program. In Columbus, call 645-TRSH.

### PET WASTE

- Dispose of pet waste properly. It is a source of bacteria for our local waterways. To prevent pet waste from harming our lawns or our waterways, bury it in the ground (away from gardens or water systems), flush it down the toilet, or wrap it up for the garbage receptacle.

### CARS, DRIVEWAYS AND GARAGE AREA

- Maintain your car. Automotive leaks on the driveway and yard will wash into storm drains and pollute the Olentangy River. If you have a leak, keep a drip pan under the leak until you repair it. Empty the collected fluids into a tightly sealed container and recycle the contents.
- Clean fluid leaks or spills on the driveway with a non-toxic, biodegradable chemical that will safely break down soil deposits (available at your local hardware store or boat marina store). Otherwise, use sand or cat litter to soak up the oil and place it in a sealed bag.
- Wash your car at a commercial car wash (confirm that they treat and recycle the wash water). If you wash your vehicle at home, do it over a gravel or grassy area and use a biodegradable, phosphorous-free soap.
- Clean sidewalks and driveways by sweeping. Hosing them down with water will carry debris and fluids into the local storm drains.
- Be careful to not spill gasoline when filling your lawnmower, weed cutters, or other yard equipment. Gasoline-powered mowers also pollute the air. Consider using an electric or non-motorized push mower.
- Reduce your usage of winter salts and de-icers. They are harmful to the grass, plants, ground water and surface waters. For snow and ice, try shoveling or using sand on your driveway and sidewalks. If you do use salt, mix it with sand so the salt is easy to sweep up later.

### DON'T LITTER

- Debris will make its way to storm drains and to our local streams.



# REDUCING LAWN CHEMICAL POLLUTANTS IN STORMWATER RUNOFF

## PESTICIDES AND FERTILIZERS

Synthetic pesticides and fertilizers can be harmful to people, pets, wildlife, beneficial insects, and the environment. When it rains, the chemicals are washed into local waterways, also causing problems for aquatic wildlife and drinking water.

We can reduce our use of synthetic pesticides and fertilizers or consider using less harmful or organic alternatives. Having a low-maintenance lawn will help protect the environment and watershed, while saving time and money.

### GENERAL TIPS FOR APPLICATIONS OF PESTICIDES AND FERTILIZER

- Be conservative when applying pesticides or fertilizers. Make sure the liquid or powder doesn't spill into drainage areas. If it spills onto the driveway or sidewalk, sweep it up for disposal.
- Try reducing your fertilizer application to twice a year, once in the spring and once in the fall, so the fertilizer has a chance to reach the grass roots.
- Do not apply fertilizer or pesticides within 24 hours before an expected rainfall. Otherwise, these applications will get washed away with the stormwater, wasting your time and resources.
- Follow all listed instructions for chemical application and disposal.



### PESTICIDE ALTERNATIVES

Instead of using synthetic pesticides, create a healthy environment to help your plants resist pests and environmental stress. Consider the following tips on how to reduce the need for synthetic pesticides.

- Create good soil texture and fertility. This is a key factor to healthy plants. Consider having a soil test done so you know what you're working with. (Commercial test kits from local soil laboratories are usually under \$20 dollars). Then you can amend the soil with compost or natural fertilizers (listed below) to create good soil conditions.
- Consider using more targeted pesticides with little or no residual effect such as insecticidal soaps, horticultural oils, or corn gluten (pre-emergent herbicide that is effective against several common weeds).
- Toleration of some pests will save you time, money and aggravation. Weeds are usually an indication of nutrient deficiency or compacted and bare soil. Most lawn insects are not harmful but in fact, may be beneficial, helping to attack other pests or break down organic matter. Check with your local extension agent for more details on specific pest problems. (Ohio State University Extension: [www.bugs.osu.edu](http://www.bugs.osu.edu) or [www.franklin.osu.edu](http://www.franklin.osu.edu))
- Prevent pests through good lawn management practices (see next section).

### FERTILIZER ALTERNATIVES

- Organic fertilizers are better than synthetic in that they add organic matter to the soil. Organic matter improves soil structure, creates pore space for adequate air and water circulation, and facilitates root growth. Organic matter also contains nutrients that are needed by plants, aids in nitrogen fixation, and helps reduce plant disease.
- Apply organic fertilizers less frequently because they release nutrients more slowly over a longer period of time. Fertilize more heavily in the fall so the organic matter has time to reach the grass roots and interact with the soil.
- Organic fertilizers preserve the biotic quality of the soil, which is good for earthworm population and normal microbial activity.
- Animal-based fertilizers include composted chicken, cow, or horse manure; bone meal; and blood meal.
- Plant-based fertilizers include compost (plant waste), seaweed, alfalfa meal, and cottonseed meal.
- Naturally-occurring minerals such as rock phosphate (for phosphorus) or greensand (for potassium) are available in powder form.
- Processed or composted sewage sludge can be added as a natural compost fertilizer for ornamental plants, though it should probably be avoided for vegetable gardens.

# GOOD LAWN MANAGEMENT REDUCES THE NEED FOR PESTICIDES AND FERTILIZERS

## WATERING

- Monitor rainfall and irrigation so that it's sufficient to wet the top 6-8" of soil. Watering your turf less often but more deeply encourages deep root growth, making it harder for weeds to compete. Approximately 1" of water per week is recommended for a healthy lawn.
- Too much water makes the lawn prone to fungal disease. Avoid frequent shallow watering.
- Water early in the morning to prevent water loss to evaporation. This will help conserve resources and save on your water bill.
- Avoid watering at the end of the day. Too much moisture overnight can increase the chances for disease.
- During extended dry periods, a lawn will go dormant and can survive with minimal watering of ½" every 2-3 weeks to keep crowns & roots alive.

## MOWING

- Proper mowing practices help prevent weeds and disease. Recommended mowing height is 2.5 –4". This will help keep the lawn dense, discourage weed growth, retain moisture, and in turn keep the crowns healthy.
- One-third rule: never remove more than 1/3 of the grass height per mowing. This helps the grass retain moisture.
- Leave grass clippings on the lawn. They return nutrients and organic matter to the soil. They can provide up to 30% of a lawn's seasonal nitrogen needs. Grass clumps can be dispersed by using a leaf rake or re-mowing in a different direction the next day.
- Alternate the direction in which you mow (at right angles) to promote upright shoot growth.
- Mow the grass before it gets too long. If you need to mow during a wet spell, make sure the blade is sharp so it won't tear the grass, causing the grass to lose moisture and become susceptible to disease.



## CORE AERATION TO MANAGE THATCH

- Core aeration is the mechanical removal of soil cores.
- Thatch is the organic layer of old grass roots, crowns and rhizomes that sit on the soil's surface. If it's thicker than 1/2", it can prevent filtration of water, air, and nutrients, creating a perfect environment for insects or disease.
- Core aeration reduces insect habitat and allows better penetration of pesticide or fertilizer treatments.
- Core aeration is especially helpful when thatch is excessive or soil is compacted because it improves water filtration and aeration of soil.
- Use core aeration in conjunction with topdressing to improve the quality of the soil.
- Do the core aeration yourself by renting the equipment from a local hardware store. The best time to aerate is spring or fall.

## TOP DRESSING (SURFACE APPLICATION OF COMPOST)

- Leaves can be chopped fine with mulching mower or by using the lawn mower twice in different directions.
- Spread the leaves out with a rake so they can work their way into the soil, improving nutrients and structure.
- The best time for top dressing is after core aeration so that the leaf mulch can be raked over the holes.

## A DENSE LAWN WILL HELP PREVENT WEEDS

- Reseed bare spots and thin areas since they are prime habitat for weeds. Prevent bare spots from occurring.
- Prune around trees and shrubs to improve air circulation.
- If your lawn succumbs to a few occasional weeds, try hand-weeding.

## COMPOSTING TURNS HOUSEHOLD WASTE INTO VALUABLE FERTILIZER

Yard wastes and kitchen scraps use up valuable space in our landfills when they could be put to good use fertilizing our yards and gardens. These materials are full of nutrients. By composting, we can recycle these materials, protect the environment, save money and improve our soil at the same time.

All organic matter eventually decomposes. Composting simply speeds up the process by providing an ideal environment for bacteria and other decomposing micro-organisms. The final product is called humus, which looks and feels like fertile garden soil.



### THERE ARE 4 KEY ELEMENTS NECESSARY TO MAKE COMPOSTING WORK

- Materials high in nitrogen (“green” materials) such as clover, grass, and vegetable scraps.
- Materials high in carbon (“brown” materials) such as dried leaves, twigs, and straw.
- Moisture provided by rain or added water to keep it damp.
- Oxygen supplied by turning or mixing the pile. More oxygen yields faster decomposition.

Everything organic has a ratio of carbon to nitrogen (C:N) in its tissues. The ideal ratio for composting is 30:1. You need to alternate “green” nitrogen materials and “brown” carbon materials to fuel the decomposition process. Wood wastes are particularly high in carbon content so nitrogen in the form of urea should be added. Urea is recommended.

#### Examples of Carbon: Nitrogen Ratio:

- Food wastes 15:1
- Grass clippings 15:1
- Leaves 50:1
- Fruit wastes 35:1
- Straw 80:1
- Wood, sticks 400:1

#### What to LEAVE OUT of the compost pile or bin:

- Weeds and diseased plants
- Meat scraps and bones
- Pet wastes (they carry disease)
- Dairy products
- Fatty foods and oil products

**COLD COMPOSTING** is the easiest and slowest method. This works well if you’re short on labor or have little yard waste. Just pile grass clippings and yard waste on the ground or in a bin. If food scraps will be added, bury the scraps deep in the compost pile. Otherwise, consider using a more secure bin that will keep out flies and wildlife.



**HOT COMPOSTING** takes a little more work but causes the material to decompose faster. A pile with minimum dimensions of 3’x3’x3’ is needed for efficient heating.

- Alternate green and brown layers.
- Keep the pile moist but not wet.
- Add garden soil between layers.
- Add nitrogen fertilizer or barnyard manure if nitrogen is needed.
- Provide aeration either by turning the pile or using bins that allow air to pass through.
- Make your own compost bin out of wire mesh, snow fence, cement blocks or rocks, wooden pallets, or buy a bin at the store.
- Check with your community authorities for any regulations concerning the location of compost bins in your yard.



## WATER CONSERVATION AND MANAGING STORMWATER RUNOFF

The roofs of our homes and other buildings are a major source for stormwater runoff. Rather than allowing this water to wash away into the storm drains, overflow sewers, or back up into our basements, we can take simple steps to manage this runoff.

- Check the gutters and roof drains to make sure there are no leaves or debris blocking water flow.
- Gutter shields will help prevent leaf accumulation and protect your gutters in the long run.
- Disconnect the downspouts from sanitary or stormwater drains (check with your local sewer system authority for guidance or regulations).
- Divert the water from your downspouts to your lawn, garden, or to a rain barrel (for storage to be used later).
- If downspouts discharge too close to the house, install extensions that carry water at least 6 feet away from the foundation.
- Use additional pieces of downspout or open gutters for the extension. Place a splash block at the end of the extension to spread the water out as it goes to the lawn.

### RAIN BARRELS

Rain barrels are an environmentally friendly way to conserve and recycle water. Placed under a downspout, the rain barrel will collect natural rainwater, which can be used to water plants, flowers, vegetables, or lawn whenever you're ready. Rainwater may contain chemicals from the atmosphere but, unlike city water, it won't have treatment chemicals added (such as chlorine) and it won't get added to your water bill.

Rain Barrels are easy to install - just connect to your downspout! Check the instructions that come with the barrel. Look for the following features:

- A mesh screen will keep out leaves, shingle grit, debris, and mosquitoes.
- An overflow spigot will enable you to drain excess water or hook up an irrigation system or a simple soaker hose.
- Soaker hoses are inexpensive, easy to install, and easy to maintain. Rain barrels fill up fast. A soaker hose will enable you to divert the water to your yard or garden as desired.





## LANDSCAPE FEATURES THAT HELP FILTER RAINWATER

### RAIN GARDEN:

You may want to consider the addition of a rain garden to your yard. Rain gardens are ideal for low lying areas that tend to accumulate excess water after a storm. It's easy to add water-tolerant plants to a ditch or wet spot that already exists. These gardens are attractive and beneficial. They help manage stormwater by filtering runoff from your lawn, driveway, and other surfaces. During a rainfall, the garden will temporarily fill with a few inches of water until the garden soil and plant roots absorb it.

### HOW TO MAKE A RAIN GARDEN

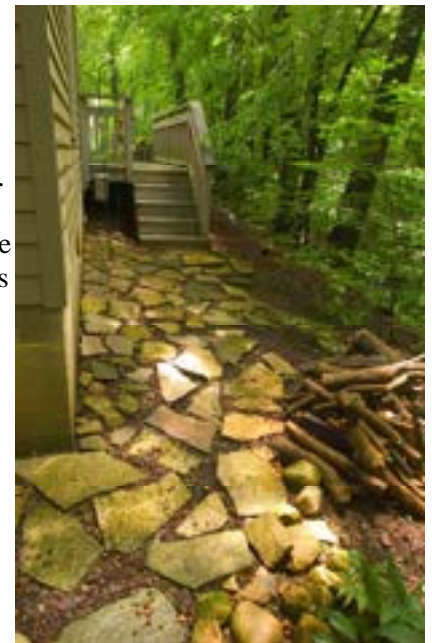
- Create a shallow depression or use an existing one.
- The garden can be arranged in any shape or size.
- You can organize and plant the garden yourself.
- Before choosing a location, test the drainage rate. Soil percolation should be 1" per hour.
- The water in the garden should drain or evaporate within 3 days to interrupt the mosquito lifecycle.
- If you have a basement, locate the garden 15' away and downhill from your house.
- Choose an area where water already tends to accumulate or create a location that fits your liking.
- Add water-tolerant wildflowers and other plants that attract birds, butterflies, or other desired wildlife.



**Examples of water-tolerant native plants to include:** Bee balm, Cardinal flower, Smooth rose-mallow, Swamp rose mallow, Spotted joe-pye weed, and many other Ohio natives. For more information on Rain Gardens, go to [www.franklinswcd.org](http://www.franklinswcd.org)

### TERRACING

Erosion sediments pollute the Olentangy River by preventing sunlight from reaching aquatic plants, destroying aquatic animal habitats, and degrading water quality. Sediments also damage storm drain systems. Making use of a hill by terracing it will help prevent erosion and retain water. Terracing can be used to shorten long slopes into a series of shorter, more level steps, which can be used as mini-gardens. This allows heavy rains to soak into the ground rather than run off and cause soil erosion. Building a terrace is like building a staircase. The material you use to make the face of the stair may be bricks, rocks, concrete blocks, or treated lumber such as railroad ties, poles or posts. Another way to prevent erosion is simply adding more vegetation to hillsides, stream banks, or bare spots in your yard. The roots of trees and shrubs are especially effective in holding soil in place.



### REDUCE IMPERVIOUS SURFACES

Increasing your landscape's porosity will allow more stormwater to filter through the ground naturally.

- Replace paved surfaces such as sidewalks, paths, and driveway, with porous material such as native grasses, groundcovers, mulch, wood chips, gravel, stones, brick, sustainable wood decking or anything else that allows water to filter through to the soil.
- Expand garden borders by adding mulch or groundcover.
- For a more serious investment, porous pavement made from interlocking cement blocks or rubber mats with infiltration pores are available from local merchants.
- Install gravel trenches along driveways or patios.

# NATIVE PLANTS

Consider native plant species for their many benefits. Ohio native plants are ones that were indigenous to Ohio prior to European settlement. In Ohio, we have a great diversity of natives that can thrive in wet or dry conditions, sun or shade, high or low fertility and acidic or calcareous soils.

## Benefits

- Native plants tend to grow better than introduced species because they have evolved and adapted to our local growing conditions.
- Native plants are less prone to disease and, once established, require less water and fertilizer than non-native species. Overall, they are easier to maintain.
- Some native plants are adaptable to a wide range of environmental conditions and others are habitat-specific.
- Adding native plants can replace lawn, reducing the amount of mowing you do.
- Native plants come in a vast array of colors, bloom at different times throughout the year, and can have colorful, decorative leaves in a variety of shapes.
- Native plants can attract native animals such as butterflies, birds, and beneficial insects. Many animals are host-dependent, that is, they need a specific type of plant to survive. Likewise, many native plants rely on animals and insects for pollination and seed dispersal.
- Native plants in Ohio can provide beauty all year round.
- Using native plants helps preserve native species and biodiversity.



**Examples of prairie or meadow plants:** Purple coneflower, Black-eyed susan, Wild bergamot, Blazing star, Little bluestem, and Yellow coneflower.

## Native prairie or meadow plants

- Can be used for sunny open areas.
- Can be grown in areas with difficult growing conditions, including poor drainage and fluctuating moisture levels, dry or rocky soils, and low fertility.
- They are a fairly low-maintenance landscape for large areas.

## Native Woodland plants

- Help preserve a native tree stand.
- Accent natural moist areas near streams.
- Generally prefer moist, fertile soils that are high in organic matter.
- Some may tolerate dry conditions.
- Many prefer acidic soils but some tolerate a wide range in soil pH.



**Examples of native woodland plants:** Wild geranium, Cardinal flower, Wild ginger, Columbine, Large flowered trillium



## TREES

There are many species of trees native to Ohio. They provide many benefits for the homeowner while simultaneously protecting water and soil resources.

### Benefits

- Draw moisture from the surrounding soil, preventing runoff and recycling the water through the ecosystem naturally.
- Intercept rainfall with their leaves, branch surfaces, and trunk bark, thereby reducing stormwater runoff.
- Increase the capacity and rate of soil infiltration, which is good for the soil and helps filter the water.
- Tree canopies reduce soil erosion by diminishing the impact of raindrops on exposed surfaces.
- Provide shelter from the wind and sun, subsequently reducing your heating and cooling costs.
- Help clean the air by cycling carbon through the atmosphere.
- Add beauty and color, increasing the value of your home.
- Screen sights and sounds, giving you more privacy.
- Provide fruit and nuts for people and animals.
- Make a great hideaway where children can play.

**Examples of native trees for landscaping:** Basswood, Oak, Muscledwood, Black gum, Yellowwood, Maple, Cucumber magnolia, Fringetree, or Tulip-poplar.



## GROUNDCOVERS

Groundcovers are low-growing plants that will continue to grow and spread over an area. They provide soil and water protection while providing wildlife habitat and aesthetic charm in your yard.



### Benefits

- Help with erosion control and maintenance of steep slopes.
- Good for areas too shady for turfgrass.
- Cover tree roots when they are close to surface causing interference for you or the lawn mower.
- Can be used to accentuate and define different areas of your yard or as a transition from lawn to taller plants.
- Many varieties provide color and texture with their diversity of flowers, fruit, and foliage.

**Examples of native ground cover include:** Wild ginger, Creeping phlox, Virginia creeper, Common blue violet, Great St. John's wort, Pennsylvania sedge.

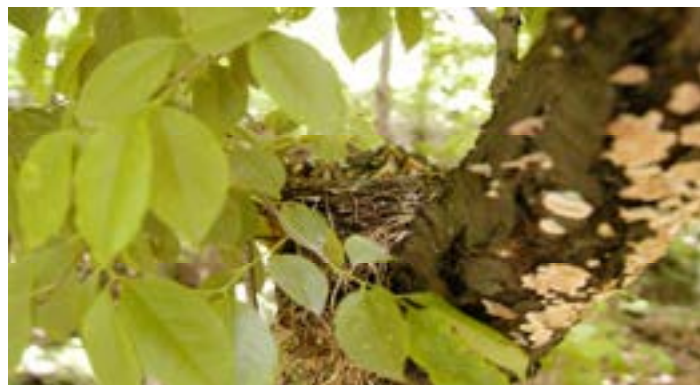
Avoid invasive species such as Wintercreeper, Vinca, and Ivy. They will take over your yard.

## ATTRACTING BIRDS AND BUTTERFLIES

There are many ways to attract wildlife to your backyard. Birds, bees, hummingbirds, butterflies, and other wildlife are drawn to plants that provide food, forage and cover. Consider natives since those are the ones adapted and inter-dependent with local wildlife.

### BIRDS

Birds are enjoyable to watch and listen to. They feed on berries, seeds, or insects. In these ways, they are beneficial for insect control and plant propagation. Consider the following native trees or shrubs to attract birds to your yard.



### SHRUBS FOR BIRDS

Shrub	Flower	Fruit	Blooms	Ht.	Light	Attracts
Black Chokeberry	white	black	May	6-8'	F, P	B, W
Red Chokeberry	white	red	May	6-8'	F,P	B, W
Ninebark	white	Blue/ black	June	4-7'	F, P	B, BF
Red Osier Dogwood	white	white	May	6-12'	F,P	B
Spicebush	yellow	red	April	6-12'	P,S	B, W
Arrowwood Viburnum*	white	Blue/ black	May	8-10'	F, P	B, BF
Nannyberry Viburnum*	white	black	May	4-10'	F,P	B

\*These are just suggested species. There are many varieties of these plants.

### TREES FOR BIRDS

Tree	Flower	Fruit	Blooms	Ht.	Light	Attracts
Ohio Buckeye	White	Nut	April	30-50'	F,P	B,HB,W
Paw Paw	Red	Fruit	April-May	15'	P,S	B,W
Allegheny Serviceberry*	White	Blue	April-May	15-25'	FPS	B,HB
Flowering Dogwood	White	Red	April-May	15-25'	P S	B,W
Washington Hawthorn*	White	Red	May	20-30''	FP	B,W
Sassafras	Green	Blue/ black	May	20-40'	FP	B,BF,W
Eastern Redbud	Purple	Seed pod	April-May	15-25'	FPS	B,W

\*These are just suggested species. There are many varieties of these plants.

B= Birds; HB = Hummingbird; W = Wildlife; BF = Butterfly



## FLOWERS FOR BIRDS AND BUTTERFLIES

These are examples of native flowers that attract both birds and butterflies. Butterflies are attracted to plants that provide nectar.

Plant	Flower Color	Bloom	Ht.	Soil	Water	Sun
Asters—varieties	Blues/ purples	Summer	varieties			
Purple Coneflower	Purple	June- Aug	2-4'	CLS	D	FP
Blazingstar-varieties	Pinks, pur- ples	Aug	varieties			
Black-eyed Susan	Golden	Aug-Sept	3-5'	CLS	DM	FP
Wild Senna	Yellow	July-Aug	4-6'	CLS	M	F
Prairie Dock	Yellow	Aug-Sept	3-8'	CLS	M	F

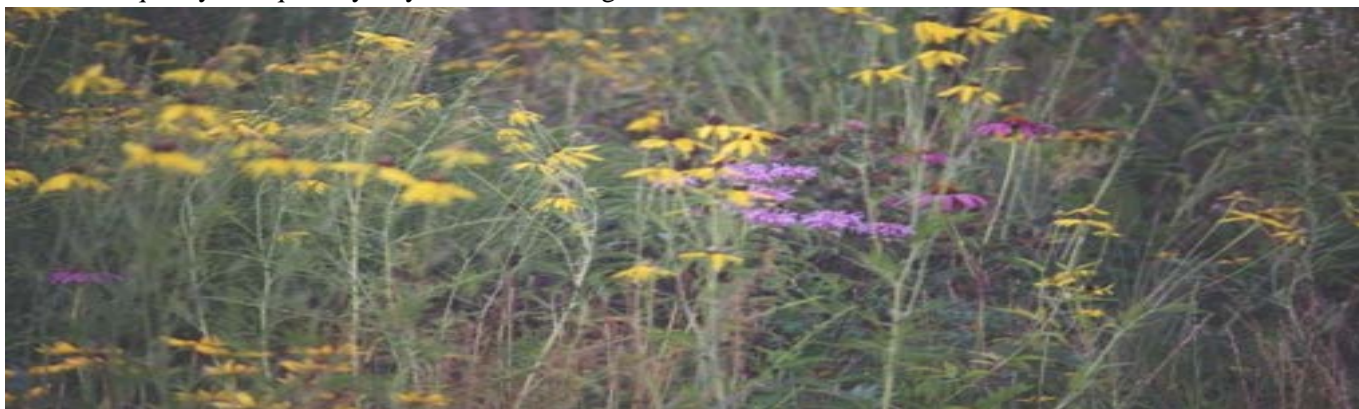
Soil: C=Clay; L=Loam; S=Sand; Water: D=Dry, M=Moist, W=Wet; Light: F=Full, P=Partial, S=Shade

## PLANTS FOR HUMMINGBIRDS

Plant	Color	Bloom	Ht.	Soil	Water	Light
Oswego Tea (Bee Balm)	Red	June-July	2-4'	CLS	DM	F
Wild Columbine	Red	Apr-July	1-2'	CL	DM	FPS
Blazingstar – varieties	Purple-pink	July-Aug	2-3'	varieties		
Great Blue Lobelia	Blue	Aug-Sept	1-3'	CLS	MW	FPS
Foxglove Penstemon	White	June	2-3'	CLS	DM	FP
Marsh Milkweed	Pink-red	July-Aug	3-4'	CLS	MW	F

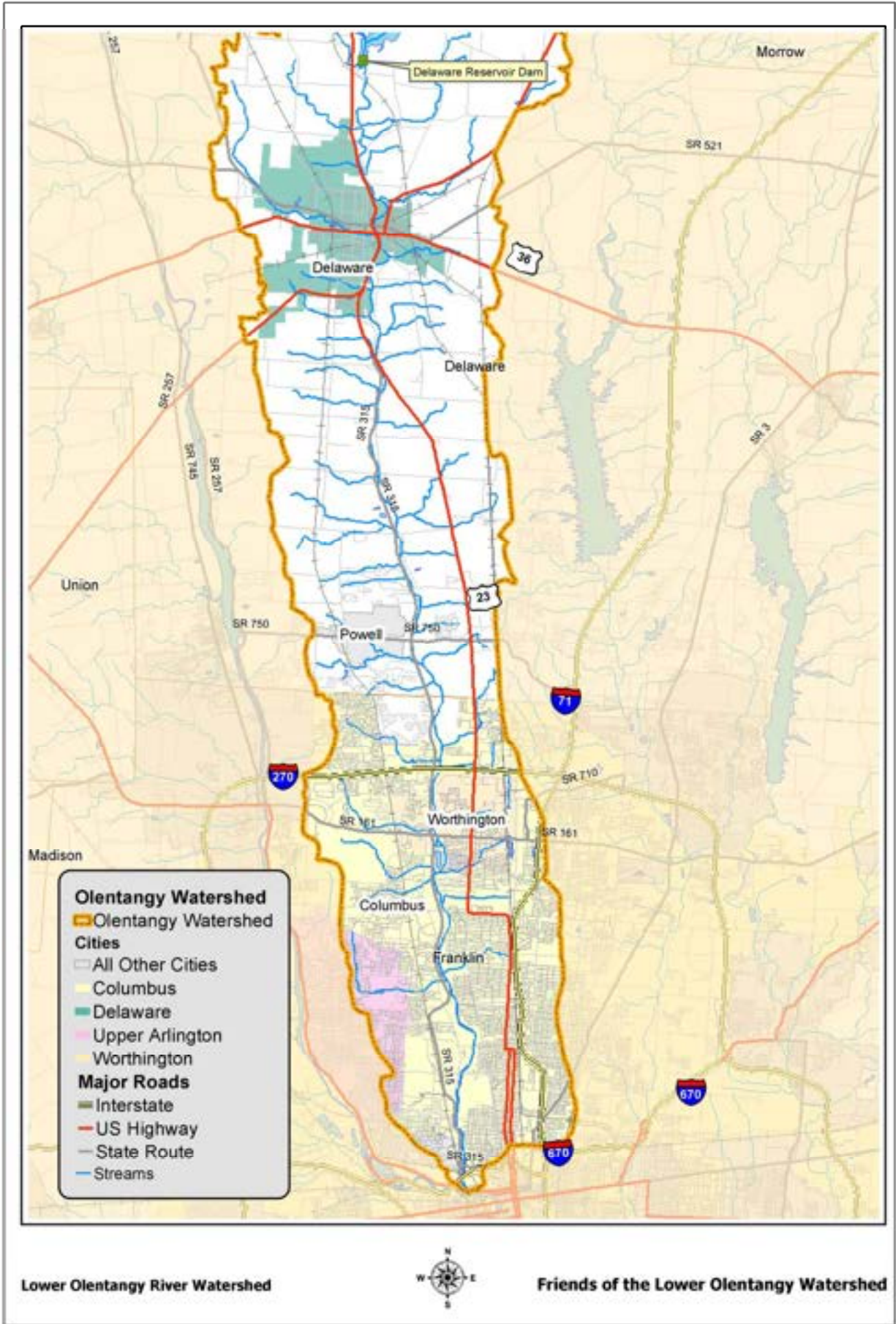
## BEES

Bees are attracted to many flowers and plants. Most bees are solitary and friendly. They nest in holes in the ground or burrows in twigs and dead tree limbs. Bees are responsible for pollinating some 30% of our diet and can increase the quality and quantity of your fruit and vegetable harvests.



## BATS

If other insects are your concern, bats can be very beneficial as they consume night-flying insects, including mosquitoes, moths, and beetles. A single Brown Bat can catch more than 600 mosquitoes in an hour. You may want to consider adding a bat box to your yard. They can be either made or bought at your local garden center.





## REFERENCES:

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Davis, California  
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Project Clean Rivers  
[www.dosd.org](http://www.dosd.org)

Natural Resource, Agricultural, and Engineering Service  
[www.nraes.org](http://www.nraes.org)

NEMO: Nonpoint Education for Municipal Officials  
[http://nemo.uconn.edu/reducing\\_runoff/](http://nemo.uconn.edu/reducing_runoff/)

Ohio Department of Natural Resources  
Division of Wildlife  
[www.ohiodnr.com/wildlife](http://www.ohiodnr.com/wildlife)

Ohio State University Extension  
<http://ohioline.osu.edu/>  
[www.franklin.osu.edu](http://www.franklin.osu.edu)  
[www.bugs.osu.edu](http://www.bugs.osu.edu)

*Fact Sheets and Bulletins include:*  
Backyard Enhancement for Wildlife  
Composting at Home  
Native plants of Ohio  
Native Landscaping for Birds, Bees, Butterflies and other Wildlife  
Natural Organic Lawn care  
Stormwater runoff

Rain Gardens of West Michigan  
[www.raingardens.org](http://www.raingardens.org)

Raincatcher4000  
[www.raincatcher4000.com](http://www.raincatcher4000.com)

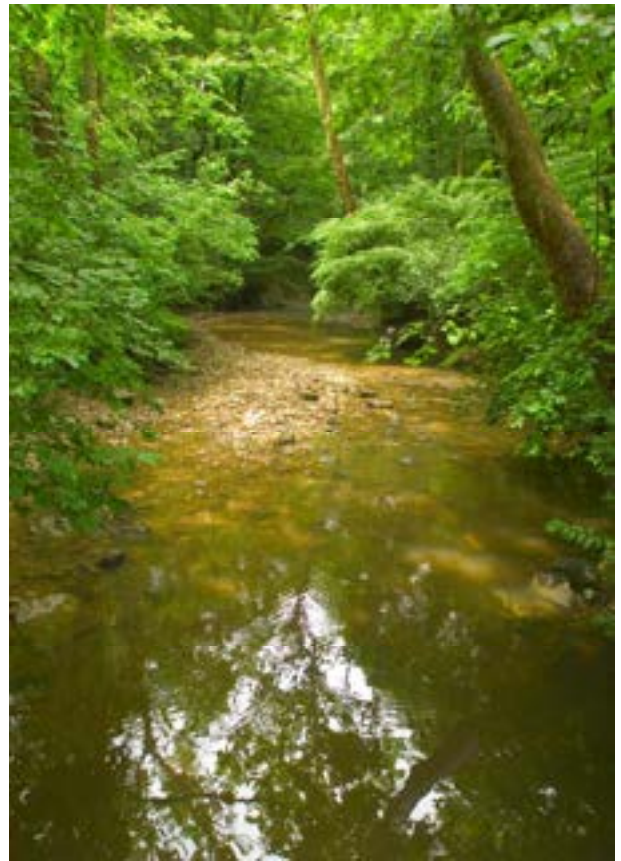
Secret Arboretum  
Ohio Agricultural Research and Development Center, OSU  
[www.secrest.osu.edu](http://www.secrest.osu.edu)

United States Department of Agriculture  
Natural Resources Conservation District  
<http://www.nrcs.usda.gov/feature/backyard>

Wild Birds Unlimited  
[www.wbu.com](http://www.wbu.com)

The Wild Ones  
Columbus Chapter  
[www.for-wild.org](http://www.for-wild.org)

Wisconsin Department of Natural Resources  
<http://dnr.wi.gov/org/water/wm/nps/rg/links.htm>



### Soil Testing Laboratories:

CLC Labs (614) 888-1663  
325 Venture Dr.  
Westerville, OH 43081

Calmar Lab (614) 523-1005  
130 S. State Street  
Westerville, OH 43081

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