

BACKYARD CONSERVATION PROGRAM

REDUCING ENVIRONMENTAL IMPACTS IN URBAN AREAS THROUGH
RESIDENTIAL NON-POINT SOURCE POLLUTION REDUCTION STRATEGIES
AND
BACKYARD CONSERVATION PRACTICES



SUMMER 2004

FRIENDS OF THE LOWER OLENTANGY WATERSHED

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FLOW


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WELCOME TO THE BACKYARD CONSERVATION PROGRAM.

The Backyard Conservation Program is a pilot project being implemented by Friends of the Lower Olentangy Watershed (FLOW) and Franklin Soil and Water Conservation District (FSWCD). This project is made possible by a grant from the Clifford and Mary Ozias Conservation and Forestry Fund of The Columbus Foundation.

The goal of this program is to reduce the impact of storm water runoff in the Lower Olentangy watershed by educating residents on conservation practices they can implement in their own backyards. The scope of this educational project will include opportunities for: conserving water; using native plants; improving habitat for birds and butterflies; reducing fertilizers, pesticides and other pollutants that get into the storm water runoff; with the end goal of protecting and improving water quality in the Olentangy River watershed, the place where we live.

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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 inhabitants. (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)

The Columbus Foundation: the Center for Charitable Giving. (www.columbusfoundation.org)

THE LOWER OLENTANGY WATERSHED:

WHAT IS A WATERSHED?

A watershed is a drainage basin for a region of land. All land is part of a watershed. The higher points of elevation on the landscape form the boundaries between watersheds. All rainfall within a watershed will drain to the same body of water (stream, river, pond, lake, ocean). The Mississippi River watershed is made up of many watersheds, such as the Ohio River watershed. These drainage basins are made up of smaller watersheds, such as the Scioto River Watershed, which is comprised of even smaller watersheds, such as our very own Olentangy River 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?

There are many potential benefits of living close to a river. Rivers are a source of life, providing habitat for fish, amphibians, insects, wildlife and water for public drinking systems. The Lower Olentangy River is home to endangered, threatened, and state special interest species of aquatic life. Rivers are also a good source of recreational activities, such as fishing, canoeing, hiking, bird watching, and enjoying nature. The Olentangy River provides all of these opportunities and more, including the Olentangy Multi-Use Trail and valuable green space for our urban area. However, our river has suffered the effects of urbanization as the Columbus area has grown, and it appears the growth will continue. That is why FLOW, various agencies, local municipalities, residents and other stakeholders are working together to protect and improve the quality of the river.



WHAT IS STORM WATER RUNOFF AND WHY SHOULD WE BE CONCERNED?

Storm water runoff is the leading cause of degradation to Ohio's waterways, which includes our Olentangy River. As rain falls into the watershed, it begins to soak into the soil. When the ground becomes saturated, the excess stormwater begins to flow across the landscape. In urban areas, excessive impervious surfaces exacerbate the problem of storm water runoff because it blocks 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, including 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?

Storm water can not be completely eliminated, but its quantity and effects can be minimized 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 storm water runoff getting into our water ways. In the following pages, we will be discussing 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 you may have.

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 may be toxic to certain aquatic animals, in large quantities.
- Make sure potentially harmful chemicals such as paints and pesticides are stored in waterproof containers, out of reach from storm water 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 aren't getting washed into storm sewers or local streams where they 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

- Pet waste 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 it.
- 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 it's way to storm drains and 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 us time and money.

GENERAL TIPS FOR APPLICATIONS:

- 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 or 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, pore space for adequate air and water circulation, and it 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; 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.

GOOD LAWN MANAGEMENT REDUCES THE NEED FOR PESTICIDES AND FERTILIZERS:

Use natives or regionally adapted species. They need less maintenance and thrive better under our weather conditions. Consider the following lawn management techniques for a healthier lawn.

WATERING:

- Rain and irrigation should be monitored so that it's sufficient to wet the top 6-8" of soil. Watering your turf in greater amounts but less often 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 IS THE 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. Overseeding can produce a denser lawn. 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. Your lawn will thank you for it.

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 it’s 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 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 time 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

Storm water runoff and the problems associated with it increase with the area of impervious surfaces. The roofs of our homes and other buildings is a major source for storm water runoff. Rather than allowing this water to wash away into the storm drains, overflow sewers or potentially back up into our basement, there are some simple things we can do 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 storm water 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. By placing them 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 the least expensive, 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.



WATER 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 in your yard 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. During a rainfall, the garden will temporarily fill with a few inches of water until the garden soil and plant roots absorb it. These gardens are attractive and beneficial. They help manage stormwater by filtering runoff from your lawn, driveway, and other surfaces.

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.

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 that have pores for water infiltration 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 cone-flower.

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 shelter from the wind and the sun.
- 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 also 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.
- Avoid invasive species such as Wintercreeper, Vinca, and Ivy. They will take over your yard.

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

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

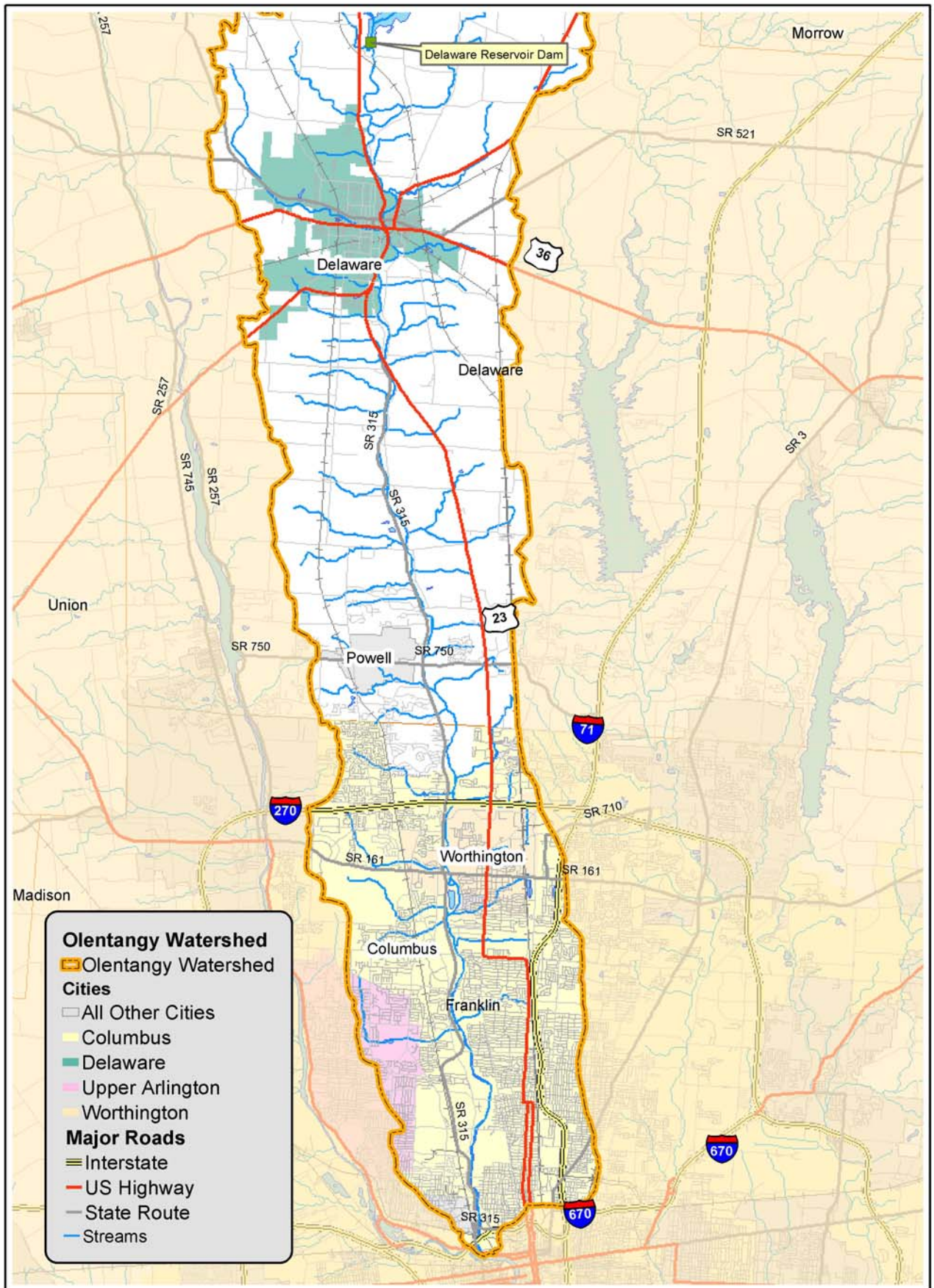
PLANTS FOR HUMMINGBIRDS:

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: 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 in fruits and vegetables 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.



- Olentangy Watershed**
- Olentangy Watershed
- Cities**
- All Other Cities
 - Columbus
 - Delaware
 - Upper Arlington
 - Worthington
- Major Roads**
- Interstate
 - US Highway
 - State Route
 - Streams



REFERENCES:

Center for Urban Forest Research, USDA Forest Service,
Davis, California
<http://cufr.ucdavis.edu>

Columbus Division of Sewerage & Drainage
Project Clean Rivers
www.dosd.org

Natural Resource, Agricultural, and Engineering Service
www.nraes.org

NEMO: Nonpoint Education for Municipal Officials
http://nemo.uconn.edu/reducing_runoff/

Ohio Department of Natural Resources
Division of Wildlife
www.ohiodnr.com/wildlife

Ohio State University Extension
<http://ohioline.osu.edu/>
www.franklin.osu.edu
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

Raincatcher4000
www.raincatcher4000.com

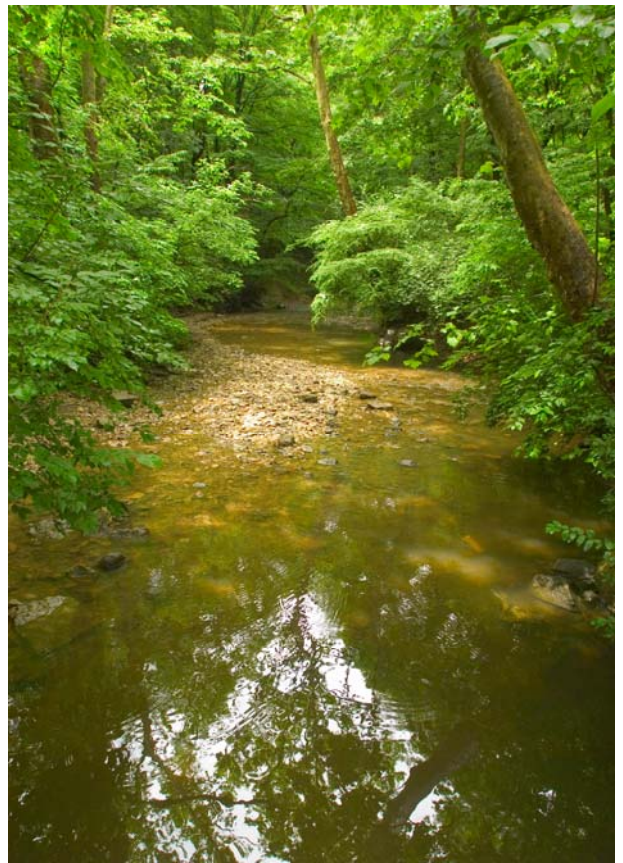
Secret Arboretum
Ohio Agricultural Research and Development Center, OSU
www.secrest.osu.edu

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

Wild Birds Unlimited
www.wbu.com

The Wild Ones
Columbus Chapter
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

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