



# Muddy Hands



Soil and Water Information for Educators Brought to You by  
the Lake County Soil and Water Conservation District

## Trees and Urban Forests

While the buzz of leaf blowers has been replaced by the roar of snow blowers, we are still surrounded by our urban forest. No matter where your school is located, there is probably at least one tree visible from the windows.

### Human comforts

In the summer we seem to be drawn to the cool shade of a large, leafy tree. Getting out of the sun feels nice, but the cool around a tree isn't only from lack of solar heat. A healthy tree has the same cooling effect as ten window air conditioner units, without the electricity input. Carefully planned plantings can save energy and money around the home or school. Evergreens are great for blocking cold winter winds, and can even be used to create a living snow fence to control drifting. Deciduous trees are a great tool to use if you want to take advantage of passive solar heating in the winter but not in the summer. Planting deciduous trees to shade south-facing windows and walls will decrease the amount of energy required to cool those rooms. Then in the fall when the leaves are gone, the sun can warm those same walls and windows, decreasing the amount of energy needed to heat those rooms.

### Habitat for animals

In the winter, our deciduous trees are mostly dormant. This makes them a great place to view squirrels, chipmunks, and various songbirds that are looking for a sunny place to perch. Some also provide food sources if they retain their fruits or seeds into the winter. If your

campus has a crabapple tree that retains its fruit into winter, each snowfall should bring in chickadees, juncos, and other small birds looking for food. As spring approaches, the returning males will also flock to deciduous trees to begin the process of staking out territory and attracting mates.

Even more important for urban wildlife can be places to shelter when the weather turns bad. We tend to exclude wild animals (with good reason) from our houses. A cluster of arborvitae or a foundation planting of yew can provide a haven for small mammals and birds during storms. The best way to locate a shelter tree is to look for tracks in the snow surrounding it.

### We just like trees

It might drive you crazy when that one kid spends the class staring out the window, but studies have shown that looking at trees reduces stress, blood pressure and muscle tension. Perhaps for this reason, houses and apartments with mature trees in the landscaping sell or rent more quickly. The presence of trees can also increase a home's value by 10% or more. Commercial areas with tree plantings have more successful businesses and the average shopper spends more time there. Trees are also an important source of food for humans. What would summer be without apple crisp, peach cobbler or cherry pie?

Just because your school happens to be in an urban setting doesn't mean you can't learn from the trees.

### Inside this Issue:

#### Trees

Trees and Urban Forests .....	1
Looking at Urban Forests in the Classroom .....	2
Changing Face of Urban Trees .....	3
Stormwater Sidebar .....	4
New at Lake SWCD .....	4

Did you know that Lake SWCD offers numerous classroom programs tailored to the Ohio Standards in science and social studies?

Our programs are free and can be scheduled anytime from October through April.

Lake County communities that are Tree Cities: Eastlake, Fairport Harbor, Mentor, Perry, Wickliffe, Willoughby

For more info, visit <http://www.arbor day.org/programs/>



## Looking at Urban Forests in the Classroom

### Estimate percentage of forest canopy cover in an area.

Urban foresters, city engineers, and stormwater planners are interested in the amount of area in a neighborhood is covered by trees. It affects runoff, rain infiltration, and even temperature. The math is pretty simple, and this is a great activity to reinforce percentages and apply the concept to real-world problems.

#### You will need:

- Color aerial photographs of the area to be studied.  
(see note)
- Toothpicks
- Markers
- Ruler with 1/8 or 1/16th inch markings, or millimeters
- Scrap paper
- Calculators or math skills

**Note:** Color aerial photographs of Lake County can be created and printed from [www.lakegis.org](http://www.lakegis.org). Disable your pop-up blocker, then click on 'Lake Navigator' in the upper right corner. Click 'Yes' to accept the waiver. Zoom into the area(s) you want to look at, setting the scale to 1" = 200' (in the lower, right corner). Once you have your map area set, the print button is the 7th one from the upper left. It will ask you to choose paper size, orientation, etc., then allow you to print your map. If you would like maps of other areas outside of Lake County, Google Maps is a good place to start.

**Preparation:** Print aerial photographs for each student or for small groups. Remember to make sure they all have the same scale. Have 10 toothpicks for each student or group of students. If students need calculators, and do not have their own, make sure you have them ready.

**Background for the students:** Hand out the aerials and help the students to recognize different features. They will pick up on football fields, tennis courts, etc. fairly easily. Help them understand the difference between lawns and mown areas (smooth, green areas) and trees or shrubs (rough, darker green or brown, depending on time of year). They may need a map to help them recognize other features, such as farm fields or unmown grass areas or marshes.

**The process:** Students will toss the toothpicks onto the map. Any that end up entirely along a roadway or other linear feature, and any that are partially or entirely off of the map should be picked up and tossed again. Each toothpick is a transect. The students need to color any portion of each toothpick that touch an area of the map that is forest cover. The hard part will be coloring them without moving them, but as each toothpick is colored, it can be removed. Once all of the toothpicks are colored and removed, the students need to measure the overall length of each toothpick and the colored portion of each. Add the colored lengths together, and add the total lengths together. This gives a fraction or ratio of forest canopy to overall area. Use the following formula for calculating percentage of canopy cover.

$$(\text{Colored lengths of 10 toothpicks} / \text{total length of 10 toothpicks}) \times 100 = \% \text{ of canopy cover}$$

**Check your work:** students working on the same maps should have similar numbers. In fact, accuracy can be improved by having several students do the same process with the same map.

**Critical thinking extensions:** Compare different areas with different characteristics. Some options would be commercial and residential, new subdivision and older neighborhood, Tree City and non Tree City communities, urban and rural, etc. If the students are up to a challenge, try black and white aerials and compare different times in the history of Lake County.

**If you would like more map resources, please contact the Lake SWCD office.**



# 2009 Spring Tree Seedling Sale

**WHITE PINE** - A yearly favorite, these trees should quickly grow to 100 feet or more. Long, soft needles make them good for ornamentals and Christmas trees as well. Tolerant of many soil conditions. 10 per packet.

**BLUE SPRUCE** - This classic is cold-tolerant and tends to grow in a symmetrical pyramid if not crowded or shaded. Slow-growing, but doesn't like soggy soils. 10 per packet.

**RED BUD** - This tree won't ever tower over your house, at its 20-35' mature height, but it should put on a show of pink-to-purple blossoms in advance of the leaves each spring. Tolerates droughty soils but prefers moist places. 5 per packet.

**FOAMFLOWER** - This shade-loving ground cover will bloom pink in spring, and has deeply lobed leaves, sometimes retaining its color into winter. Excellent for places too shady for grass.

**AMERICAN HYBRID CHESTNUTS** - This is a cross between American and Chinese chestnut that retains the upright American structure, with the blight resistance of the Chinese chestnut. A fast-growing and upright tree that will reach 50' and may start producing nuts in as little as 5 years. Prefers well-drained soils. 3 per packet.

## FOREST NUT (3 OF EACH SPECIES)

**BLACK WALNUT** - A fast-growing tree that also prefers wet soils. Highly prized timber tree and also produces edible nuts. Yellow leaves in the fall.

**WHITE OAK** - This tree grows well in a yard, but can also be used to naturalize areas. Deer, squirrels and larger birds are attracted to the acorns. It can eventually reach 100 feet. Younger oaks are tolerant of shady conditions.

**BITTERNUT HICKORY** - Similar in size, structure and growing conditions to shagbark, but with a more tannic, bitter nut. Wildlife still like them, but humans usually don't.

## FOREST HARDWOOD (3 OF EACH SPECIES)

**SUGAR MAPLE** - Best known for bright fall colors, these trees can eventually reach 100' and prefer sunny spots.

**BLACK CHERRY** - A great timber tree which puts on shows of white flowers in late spring and purple berries in August. Grows to 60' or more.

**TULIP POPLAR** - A broad, upright tree that is quick to shed its lower branches. Tulip poplars have bright orange and green flowers in the spring, if you remember to look up for them.

## WILDLIFE (3 OF EACH SPECIES)

**SERVICEBERRY** - This small, deciduous tree may reach 25'. Its berries come from showy white spring flowers, and the tree is one of the first to turn in the fall, usually an orange or red color.

**SARGENT CRABAPPLE** - Reaching only 10-12' in maturity, this crabapple has white spring flowers and small red fruits that last into the winter to attract birds.

**EASTERN RED CEDAR** - This evergreen provides cover and a food source for birds and small mammals. May reach 40 feet if left untrimmed, and can be used for shelter or hedge plantings.

## STREAM AND POND (3 OF EACH SPECIES)

**REDOSIER DOGWOOD** - A woody shrub that might reach 20' but is usually shorter. Named for the red bark, it also provide small, sour berries for wildlife in late fall and winter.

**PURPLEOSIER WILLOW** - Younger shoots show purple bark, later fading to grey. This water-loving shrub will grow to about 20' high. Also makes a good living snow fence.

**SYCAMORE** - The white bark of these trees is a year-round indicator of the wettest landscape spots. These trees will grow quickly and can eventually reach to 120'.

**NEW!** **BACKYARD DESSERT STARTER KIT (2 OF EACH SPECIES)**

**NANKING CHERRY** - This shrubby cherry tree will stay under 8 feet, and produce bright red sour cherries, suitable for baking or canning. White spring flowers and yellow leaves in fall.

**THORNLESS RED RASPBERRY** - A fruiting shrub that will be easier to pick than wild raspberries. For best production, you will need to prune it mercilessly every few years.

**BLUEBERRIES** - Two varieties of long-bearing blueberries should bring you several pies throughout the summer. Must be planted near each other for cross pollination.



**BIRDHOUSES** - Birdhouses are hand-made out of unfinished wood. Bluebird, wren, bat, and wood duck / screech owl are available.

**TREE FLAGS** - White wire flags useful for marking young trees and preventing lawn mower casualties

## NEW! ADOPT-A-VINE PROGRAM

Grape vines will come as grafted bare-root plants. When filling out the order form, please indicate which variety you would like, and if you want to plant the vines in your yard or donate them to your favorite vineyard. For more information on the program, and participating vineyards, see Page 2.

**RIESLING** - A white grape variety which originates in the Rhine region of Germany. Riesling is an aromatic grape variety used to make dry, semi-sweet, sweet and sparkling white wines. Riesling is highly "terroir-expressive", meaning that the character of Riesling wines is clearly influenced by the wine's place of origin.

**CABERNET FRANC** - One of the major varieties of red wine grape grown in Bordeaux. Cabernet Franc is lighter than Cabernet Sauvignon (of which it is a parent). These thin-skinned grapes produce wines with strong aromas of raspberries, green peppers and fresh cut grass while carrying high levels of acidity. The Cabernet Franc wine's color is bright pale red.





PACKET	COST		NO. OF PACKETS	TOTAL
White Pine (10)	\$ 8	X	_____	= _____
Blue Spruce (10)	\$ 8	X	_____	= _____
Red Bud (5)	\$ 8	X	_____	= _____
Forest Nut (9)	\$12	X	_____	= _____
Forest Hardwood (9)	\$12	X	_____	= _____
Wildlife (9)	\$12	X	_____	= _____
Stream and Pond (9)	\$12	X	_____	= _____
Backyard Dessert Starter Kit (6)	\$12	X	_____	= _____
Foamflower	\$ 6	X	_____	= _____
Hybrid Chestnuts (3)	\$12	X	_____	= _____
Packaging (required for all tree orders)	\$ 4	X	_____ 1 _____	= _____ \$4 _____
Bluebird House	\$ 8	X	_____	= _____
Wren House	\$ 8	X	_____	= _____
Bat House	\$10	X	_____	= _____
Wood Duck/Screech Owl House	\$20	X	_____	= _____
Adopt A Vine: Taster (3 vines)	\$30	X	_____	= _____
See below	Enthusiast (10 vines)	\$100	X	_____
	Connoisseur (50 vines)	\$500	X	_____

Total:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, ZIP Code: \_\_\_\_\_

Daytime phone (between 8 AM and 4 PM): \_\_\_\_\_

E-mail address (only used if we need to contact you about your order): \_\_\_\_\_

For Adopt A Vine orders: Please specify quantity of each: \_\_\_\_\_ Cabernet Franc \_\_\_\_\_ Riesling  
 Vines to be planted at (circle one): Ferrante      Debonne      Grand River Cellars      St. Joseph      My yard

- To order:
- Fill out the form above. Keep this portion for reference.
  - Send form, along with check or money order to Lake SWCD, 125 E. Erie St, Painesville OH 44077.
  - **Orders will not be processed until payment is received.**
  - Sorry, we cannot take credit cards.
  - **Place orders by February 23.**
  - Any order placed after that date will be subject to availability.

- To pick up order:
- Trees will be distributed in the Natural Resources Building at the Lake County Fairgrounds, 1301 Mentor Ave.
  - Pick-up times are Friday, April 17 from 9 AM to 6 PM and Saturday, April 18th from 9 AM to Noon.
  - Lake SWCD is not responsible for orders that are not picked up by noon Saturday. If you cannot pick up your trees, please make arrangements for someone else to pick them up.
  - Orders will be distributed in 5 gallon buckets, and should fit in most cars.

We reserve the right to make substitutions if necessary.  
 The plants are nursery inspected to be disease-free. Lake SWCD cannot guarantee their survival after distribution.  
 Planting instructions will be provided when you pick up your trees.





## Invasive Species in Ohio's Woods

Non-native diseases, pests, and even some native problems tend to hit urban trees harder. Some of this is merely personal perception—you are more aware of that one dogwood outside your classroom window than the dogwoods growing wild in the forest. But urban trees are also more susceptible to diseases and invasive pests. They are not necessarily adapted for living in holes in sidewalks, having mowers passing over their roots every week, or transpiring exhaust-filled air along a busy street. These tend to stress our urban trees and make them more vulnerable. Below are listed some of the diseases, pathogens, and pests that have been introduced to northeast Ohio or have become more prevalent in urban areas.

**Emerald Ash Borer:** This latest threat to Ohio's forests came to North America from Asia. It likely hitched a ride in wood-based packaging materials and gained a stronghold in the Detroit area. EAB have been moving steadily outward ever since. Currently (late 2008) Lake County has not had a positive ID yet, however Cuyahoga County is under quarantine. You or your students might have seen the signs along the highways at the Lake County line. The other common roadside sign of monitoring efforts are large, purple triangular traps hung from ash trees. These are monitoring the extent of the EAB presence.

Emerald Ash Borer damages trees by disrupting the flow of nutrients. The EAB larvae live under the bark, eating the cambium and phloem. After a few years of activity, the tree is essentially girdled - all of the pathways for nutrients to move between the roots and the leaves have been severed. Emerald Ash Borer adults rarely travel over half a mile. That fact, combined with the pattern of spread closely following interstate highways, seem to indicate that much of the increase in EAB-affected areas are because of humans moving eggs, larvae, or adults. Many cities are now faced with the unpopular and expensive task of removing all of the ash trees from parks, tree lawns, and other public areas. This is particularly tragic, because many ash trees were planted after elms were removed.

**Dutch Elm Disease:** DED came from China via Europe, landing in the New York City area in the early 1900's.

This fungus wiped out American and European elm species throughout the U. S. This was especially hard on urban areas, since elms were so popular along streets. Their upright vase shape and lack of large seeds made them ideal for shading streets without obscuring signs, lights, or hitting taller vehicles. In the 1970's, many urban areas went from forested, shady neighborhoods, to stark, bright mown lawns as every elm tree on street after street was removed. DED spreads by direct contact between trees (branches or roots) or by humans or insects carrying the spores.

**Gypsy Moth:** This insect is a bit unusual in that it was deliberately brought over to the U. S. with the idea of creating a silk industry in North America. Silk production was unsuccessful, as was the containment plan for the caterpillars. The caterpillars are voracious eaters and in small numbers can defoliate, or remove all the leaves from, acres of forest. Gypsy moth caterpillars are not picky - they can feed on more than 600 different North American species. While most deciduous trees have the ability to produce a second set of leaves mid-summer, having to do so several years in a row can weaken a tree or kill it outright. The severity of the gypsy moth problem varies by location and weather conditions. Scientists are working with bacterial controls and integrated pest management programs.

**White Pine Blister Rust:** This fungus is an interesting case to follow for classes studying fungi. It requires two different hosts; white pine, and gooseberries or currants (*genus Ribes*). Starting with the canker, or infected spot on the pine bark, the fungus produces spores that spread the canker on the pine tree. This continues often until the stem or branch is girdled. In the spring, the fungus produces a different type of spore that is carried by the wind onto gooseberry leaves. On the leaves it produces one type of spore throughout the summer to re-infect gooseberry leaves. In the fall, the fungus produces a different type of spore to infect pine trees. This one is again carried by wind and enters the pine tree through the stoma in the needle and migrates into the bark from there. Total of four different spores on two different plants.

## Muddy Hands

### Stormwater Sidebar

The urban forest canopy is an important part of the stormwater system. In a light rain, the leaves or needles can capture a high percentage of the precipitation before it ever hits the ground. The water can then evaporate directly from the leaves back into the atmosphere; otherwise it can be held for several hours on the leaves before eventually falling to the ground. This retention of water helps to decrease the amount of water that flows into storm drains and also spreads that amount of water out over time.

Intact forest cover around urban streams and waterways can also help reduce thermal pollution. Since hot water doesn't hold as much oxygen, thermal pollution can disrupt the aquatic ecosystem. Trees that shade streams reduce the amount of sunlight that heats the water. The trees that shade your house, your driveway, and your city streets also decrease the amount of solar heat that those surfaces absorb. Then the rain that does reach these impervious surfaces doesn't pick up as much heat.

Urban trees can also negatively affect water quality, sometimes even at the city's request! Every fall, people feel compelled to rake their yards of every last leaf. Chances are your city has a leaf pick-up service, and they encourage you to pile those leaves on the tree lawn. Unfortunately, the tree lawn is right next to the storm drains, and too many of the leaves find their way into our streams. This leads to nutrient problems as the leaves decay. Improper use of leaf blowers and the gasoline and oil needed to run them also pose a potential source for stormwater pollution.



#### Your Lake SWCD Contact:

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### New at Lake SWCD:

**Watershed Watch** - Lake SWCD has received a \$500 grant from the Partners in Science Excellence. This grant will replace some consumable supplies for Spring and Fall 2009 monitoring seasons, and purchase new pH kits. New mesh for the kick seines and two new D-shaped dip nets are also part of the grant. The new equipment will be used with 5th - 12th graders to collect aquatic macroinvertebrates and determine water quality.

Lake SWCD would like to thank Partners in Science Excellence for their support of this 15-year program. For more information on PSE, visit <http://www.pse-lake.org/>

If you would like more information about Watershed Watch and how your class can participate, contact Beth at Lake SWCD.

**Maps and Mapping** - Additional grant money is being used to create a Map Kit for teachers to borrow. This set of resources will be tailored to the Ohio Social Studies Standards. Activities will include creating topographic maps, building 3-D landscapes from flat maps, and various other map making and map reading activities. There will also be several large-scale, durable maps that an entire class can use at once. The Map Kit will be available in February of 2009. If you would like to test drive the Map Kit in your classroom, please contact us to get on the schedule.

**Enviroscape** - Coming soon, a new Enviroscape model! Many Lake County students and teachers have seen our Enviroscape - the tabletop model that uses drink mixes and cocoa powder to simulate non-point source pollution. The Enviroscape has worked hard over the years, and it is beginning to show. Lake SWCD is part of a state-wide grant to replace and upgrade Enviroscape models. Sometime in 2009 we will receive a Drinking Water and Wastewater Treatment model, including features such as lift-away roads that expose the drinking water, wastewater, and stormwater systems underneath, as well as working rural wells. We will keep the original Enviroscape available for teachers to borrow.

Lake SWCD develops or purchases new materials based on requests we get from educators in Lake County, and successful programs in other counties in Ohio. If there is a content area you'd like to have more materials and information for, please contact Beth Landers at the Lake SWCD office.