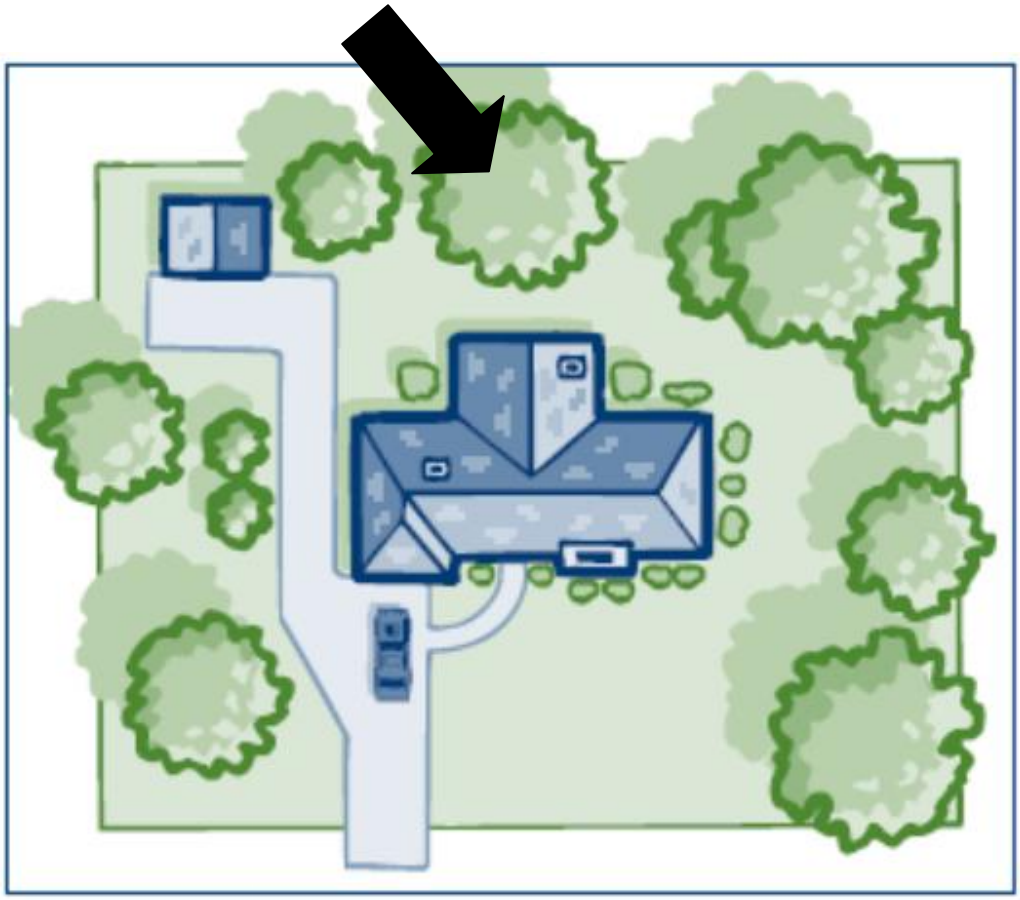
TAKE-HOME ACTIVITY

Calculate the benefits of the trees at your house!

STEP 1
Pick your tree!

Pick a tree in your yard or neighborhood that you want to calculate the benefits for.



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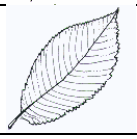
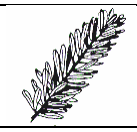
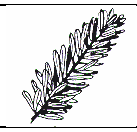
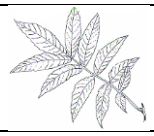
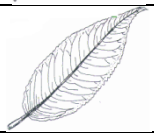
STEP 2
Find your tree species!

Use this tree identification key to help you decide what type of tree species you have. Read the questions and choose the description that matches your tree the best. Use the pictures to help you decide. If your tree matches the description, follow the directions in parentheses until your tree species is revealed! For extra help, use the definitions at the end of the key. If you do not find a tree species that matches your tree, you may have to use tree identification books to help you.

TREE IDENTIFICATION KEY	
Does your tree have leaves or needles? START HERE!	
	Tree has needles (Go to CONIFEROUS TREE KEY)
	Tree has leaves (Go to DECIDUOUS TREE KEY)
CONIFEROUS TREE KEY	
1. Are the needles scale-like?	
	Needles are flattened and scaly (Go to TREES! Part A)
	Needles are not flattened and scaly (Go to #2)
2. How do the needles grow?	
	Needles grow in single leaves (Go to #3)

	Needles grow in a group or bundle (Go to TREES! Part B)
	Needles grow in a cluster (Go to TREES! Part C)
3. What do the needles feel like?	
	Needles are flat and friendly (Go to TREES! Part D)
	Needles are square, 4-sided, stiff, and sharp (Go to TREES! Part E)
DECIDUOUS TREE KEY	
1. Do the branches grow directly across from each other?	
	Branches grow across from each other (Go to #2)
	Branches do not grow across from each other (Go to #4)
2. What type of leaf does the tree have?	
	Simple leaf (Go to #3)
	Compound leaf (Go to TREES! Part F)
3. What does the edge of the leaf feel like?	
	Leaf has smooth edges (Go to TREES! Part G)
	Leaf has toothed edges (Go to TREES! Part H)
4. What type of leaf does the tree have?	
	Simple leaf (Go to #5)

	Compound leaf (Go to TREES! Part I)
5. Does the leaf have lobes?	
	Leaf has lobes (Go to TREES! Part J)
	Leaf does not have lobes (Go to #6)
6. Does the tree have any of these?	
	Tree has bark that looks like paper (Go to TREES! Part K)
	Leaves have flattened stems (Go to TREES! Part L)
	Tree does not have papery bark or flattened stems (Go to TREES! Part M)

DEFINITIONS

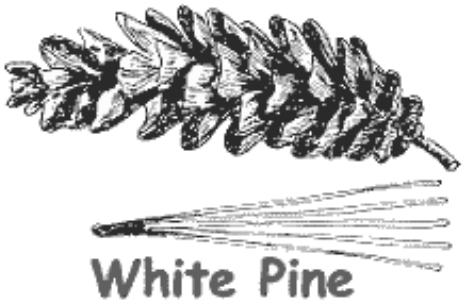
- **Coniferous tree** - A tree that bears cones and has needles. These trees do not shed their leaves each year.
- **Deciduous tree** - A tree that sheds all of its leaves each year. These trees are also called broad-leafed.
- **Simple leaf** - A type of leaf that has one leaf blade attached to a twig by a stem.
- **Compound leaf-** A type of leaf that has one stem and many smaller leaflets. A leaf begins where the leaf stem attaches to the twig.
- **Lobe** – A type of leaf edge that has large rounded sections.
- **Smooth leaf edge** – The edge of the leaf has no waves, points, or rough spots.
- **Single-toothed leaf edge** - The edge of the leaf has small points or bumps along it (teeth). All of the teeth are about the same size.
- **Double-toothed leaf edge** - The edge of the leaf has small points or bumps along it (teeth). On each tooth there is a smaller tooth.
- **Leaflet** – The small parts of compound leaves that make up the entire leaf. They look like leaves themselves.
- **Leaf scar** – The mark left on a twig after a leaf falls. It is the spot where the leaf was once attached by a stem to the twig.

TREES! PART A – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

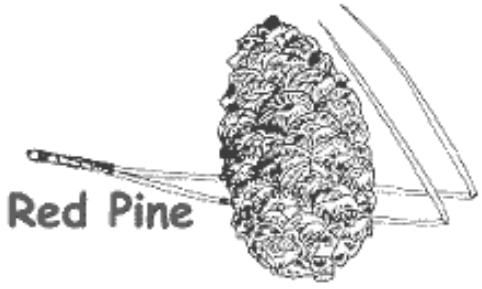
The northern white cedar is a coniferous tree that has flat, scaly needles. The tree has small cones and the branches are fan-like.

The red cedar is a coniferous tree that has flat, scaly needles. The tree has dark, blueberry-like fruit. Its scales are rounded and sometimes the tree has prickly needles.

TREES! PART B – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.



The white pine is a coniferous tree whose needles grow in bundles or groups. This tree has 5 needles per bundle.



The red pine is a coniferous tree whose needles grow in bundles or groups. This tree has 2 needles per bundle and the needles are 3 to 4 inches long.

The jack pine is a coniferous tree whose needles grow in bundles or groups. This tree has 2 needles per bundle and the needles are less than 2 inches long.

TREES! PART C – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

The tamarack is a coniferous tree whose needles grow in clusters. Each cluster contains more than 5 needles.

TREES! PART D – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

The balsam fir is a coniferous tree that has flat, single needles. The needles are 1/2 inch long.

The hemlock is a coniferous tree that has flat, single needles. The needles are 3/4 inch to 1 1/4 inches long.

TREES! PART E – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

The white spruce is a coniferous tree that has single needles. The needles are 1/3 to 3/4 inch long and feel square and stiff. The twigs are hairless.

The black spruce is a coniferous tree that has single needles and often grows in wet areas. The needles are 1/3 to 3/4 inch long and feel square and stiff. The twigs have hair.

TREES! PART F – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

The black ash is a deciduous tree that has compound leaves. The branches grow across from each other. The leaf has 9 to 11 leaflets and they are not attached to the stem by a stalk.

The green ash is a deciduous tree that has compound leaves. The branches grow across from each other. The leaf has 7 to 9 leaflets with a stalk attaching it to the stem.

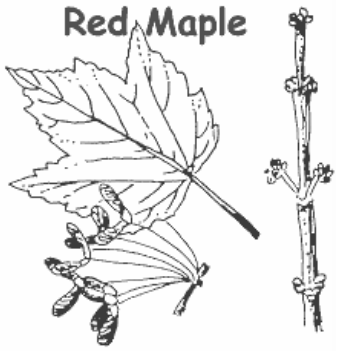
The white ash is a deciduous tree that has compound leaves. The branches grow across from each other. The leaf has 5 to 9 leaflets, with a stalk attaching it to the stem, and a smile-shaped leaf scar.

The boxelder is a deciduous tree that has compound leaves. The branches grow across from each other. The leaf has 3 (sometimes 5) leaflets.

TREES! PART G – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

The sugar maple is a deciduous tree that has simple leaves. The branches grow across from each other. The leaf has 5 lobes and the edge feels smooth.

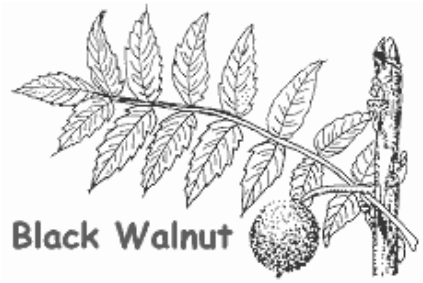
TREES! PART H – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.



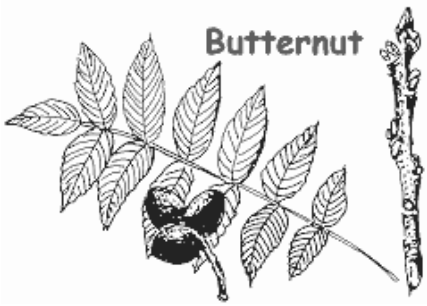
The red maple is a deciduous tree that has simple leaves. The branches grow across from each other. The leaf has 3 to 5 lobes and the edge of the leaf is double-toothed.

The silver maple is a deciduous tree that has simple leaves. The branches grow across from each other. The leaf has 3 to 5 lobes that are separated by deep openings and the edge of the leaf is single-toothed.

TREES! PART I – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.



The black walnut is a deciduous tree that has compound leaves. The branches do not grow across from each other. The leaf has 7 or more leaflets that are pointed. It has a yellow-green fruit that is 1 to 2 inches in diameter.



The butternut is a deciduous tree that has compound leaves. The branches do not grow across from each other. The leaf has 7 or more leaflets that are pointed and are 8 to 24 inches long.

The bitternut hickory is a deciduous tree that has compound leaves. The branches do not grow across from each other. The leaf has 7 to 11 leaflets. The fruit is about 1 inch in diameter and comes to a sharp in the middle.

The shagbark hickory is a deciduous tree that has compound leaves. The branches do not grow across from each other. There are 7 or fewer (usually 5) leaflets and an egg-shaped nut. The bark looks like it curls upwards and is peeling off.

The black locust is a deciduous tree that has compound leaves. The branches do not grow across from each other. The leaf has more than 7 leaflets that are rounded. The lealeaflets are about 1 inch long.

The honey locust is a deciduous tree that has compound leaves. The branches do not grow across from each other. The leaf has more than 7 leaflets that are rounded. The leaflets are ½ to 1 ½ inches long.

The mountain ash is a deciduous tree that has compound leaves. The branches do not grow across from each other. The leaf has 7 or more leaflets that are pointed and are 6 to 8 inches long.

TREES! PART J – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

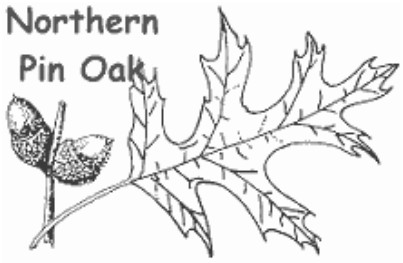
The bur oak is a deciduous tree with simple leaves. The branches do not grow across from each other. The lobes are rounded and the underside of the leaves is hairy.

The white oak is a deciduous tree with simple leaves. The branches do not grow across from each other. There are 5 to 9 deep lobes that are rounded. The leaves are hairless.

The swamp white oak is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf has a hairy underside, rounded lobes, and is widest close to the middle.

The black oak is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf has pointed lobes and is dark green, shiny, and leathery.

The red oak is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf is hairless with pointed lobes. They are dull green in color.

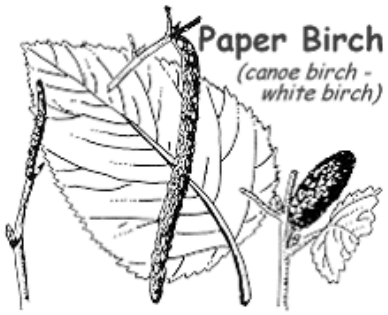


The northern pin oak is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf is hairless with pointed lobes. There are deep openings between the lobes.

TREES! PART K – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

The yellow is a deciduous tree with simple leaves. The branches do not grow across from each other. The bark looks like paper and is yellow or bronze colored. The leaf has double-toothed edges.

The river birch is a deciduous tree with simple leaves. The branches do not grow across from each other. The bark looks like paper and is reddish-brown to silver-gray colored. The leaf has double-toothed edges.



The paper birch is a deciduous tree with simple leaves. The branches do not grow across from each other. The bark looks like paper and is white colored. The leaf has single-toothed edges.

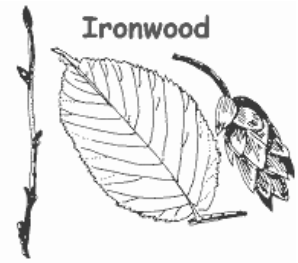
TREES! PART L – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.

The large-tooth aspen is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stems are flat and the edge of the leaf has big teeth.

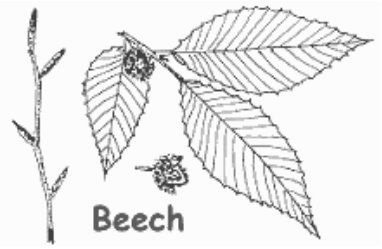
The quaking aspen is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stems are flat and the edge of the leaf has small teeth.

The balsam poplar is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf is nearly as long as it is wide, has a flattened stem, and has small teeth along the edge.

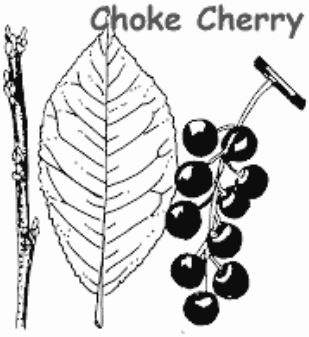
TREES! PART M – Your tree is one of the trees pictured below. Look closely and read the description before you decide what your tree is.



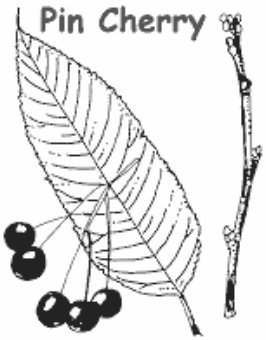
The ironwood is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. Leaves are dull and rough. The bark is reddish colored and scaly.



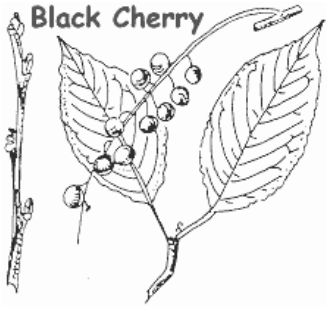
The beech is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. Leaves are shiny and leathery with large, sharp teeth.



The choke cherry is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. Leaves are 1 to 3 ½ inches long with teeth along the edge. The underside of the leaf is lighter colored than the top of the leaf.



The pin cheery is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. Leaves are light green with a sharp tip at the end and teeth along the edge.

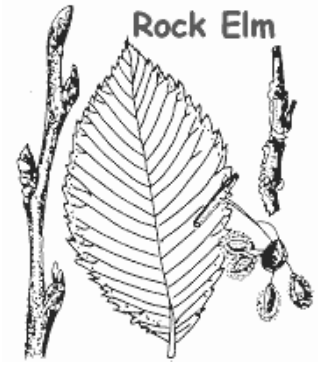


The black cherry is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. Leaves are 2 to 6 inches long with small teeth and the bark is dark in color.

The hackberry is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. Leaves are 2 to 4 inches long, hairy, and have sharp, pointed teeth.

The basswood is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded. The leaf is nearly as wide as it is long and the leaf edge has large teeth.

The willow is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are at least 3 times longer than they are wide.



The rock elm is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. The bottom of the leaf does not touch at the same place on the stem.

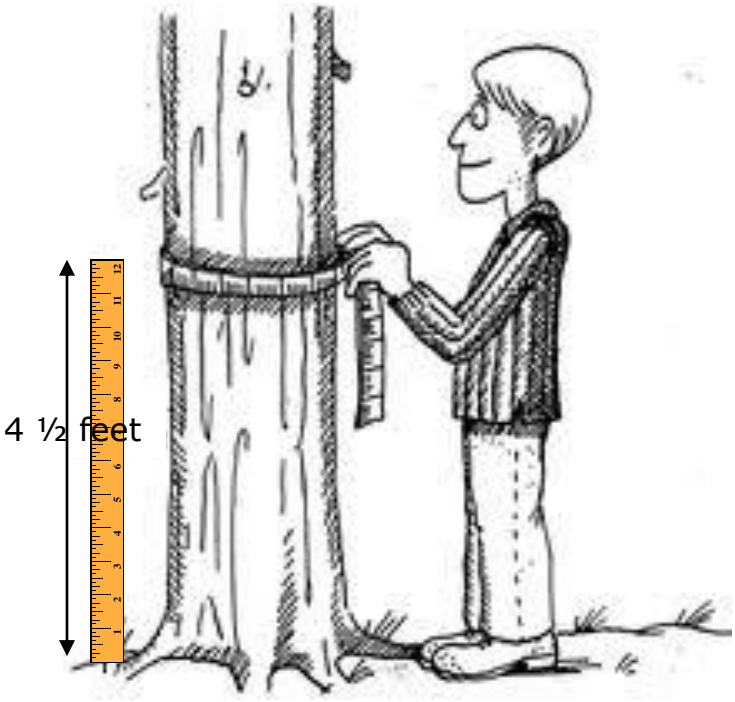
The American elm is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. The bottom of the leaf does not touch at the same place on the stem.

The slippery elm is a deciduous tree with simple leaves. The branches do not grow across from each other. The leaf stem is rounded and leaves are longer than they are wide. The bottom of the leaf does not touch at the same place on the stem.

Adapted from: Wisconsin's K-12 Forestry Education Program www.uwsp.edu/cnr/leaf and the Wisconsin Department of Natural Resources' "EEK!" Dichotomous Tree Key http://dnr.wi.gov/org/caer/ce/eek/veg/treekey/index.htm

STEP 3
Measure your tree!

Knowing the circumference of your tree will help you calculate its benefits. Follow the directions to measure your tree.



You will need:

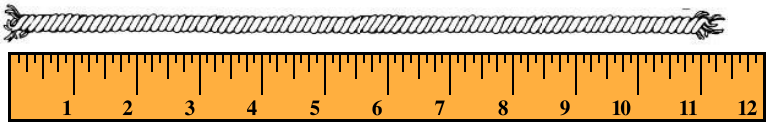
- Piece of rope or string
- Yard stick
- Tape

1. Measure 4 ½ feet from the ground up the trunk of the tree. Mark the height on the tree with a piece of tape.

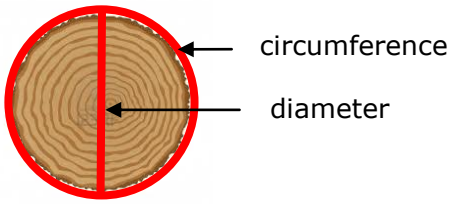
2. Wrap the rope around the trunk of the tree tightly so it touches the bark and does not sag in any places. You want to make sure that the rope is 4 ½ feet from the ground the whole way around the tree.

3. When you have the rope wrapped around the tree trunk, mark the rope with tape so you know how much rope was needed to make a full circle around the tree trunk.

4. Measure the length of rope that you needed to make a full circle around the tree trunk using a yard stick. Write down this number in inches. This is the circumference of your tree.



5. To calculate the diameter of the tree, divide the circumference by 3.14.



STEP 4
Pick your condition!

Trees can become sick or unhealthy as they grow older. Look at the leaves on your tree carefully. Does it look like it is missing any? Read the tree condition types below and decide which one best fits your tree!

Excellent 	Your tree does not appear to be missing leaves
Good 	Your tree does is missing a small portion of its leaves
Fair 	Your tree is missing about a quarter of its leaves
Poor 	Your tree is missing at least half of its leaves
Dead/Dying 	Your tree is missing all or most of its leaves

Adapted from: Nicholas J. Souter, Richard A. Watts, Melissa G. White, Amy K. George, Kate J. McNicol, A conceptual model of tree behaviour improves the visual assessment of tree condition, Ecological Indicators, Volume 10, Issue 5, September 2010, Pages 1064-1067

STEP 5
Calculate your tree's benefits!

Use the i-Tree Design tool to calculate the benefits of your tree.

- Open Mozilla Firefox or Google Chrome on your computer
- Go to: http://www.itreetools.org/design.php
- Enter your address, then click the Go! button
- Follow the directions on the screen to enter the information that you collected in steps 1-4 of this activity
- Click the Continue & Estimate Full Benefits » button
- Look at all of the benefits that your tree provides people and the environment!