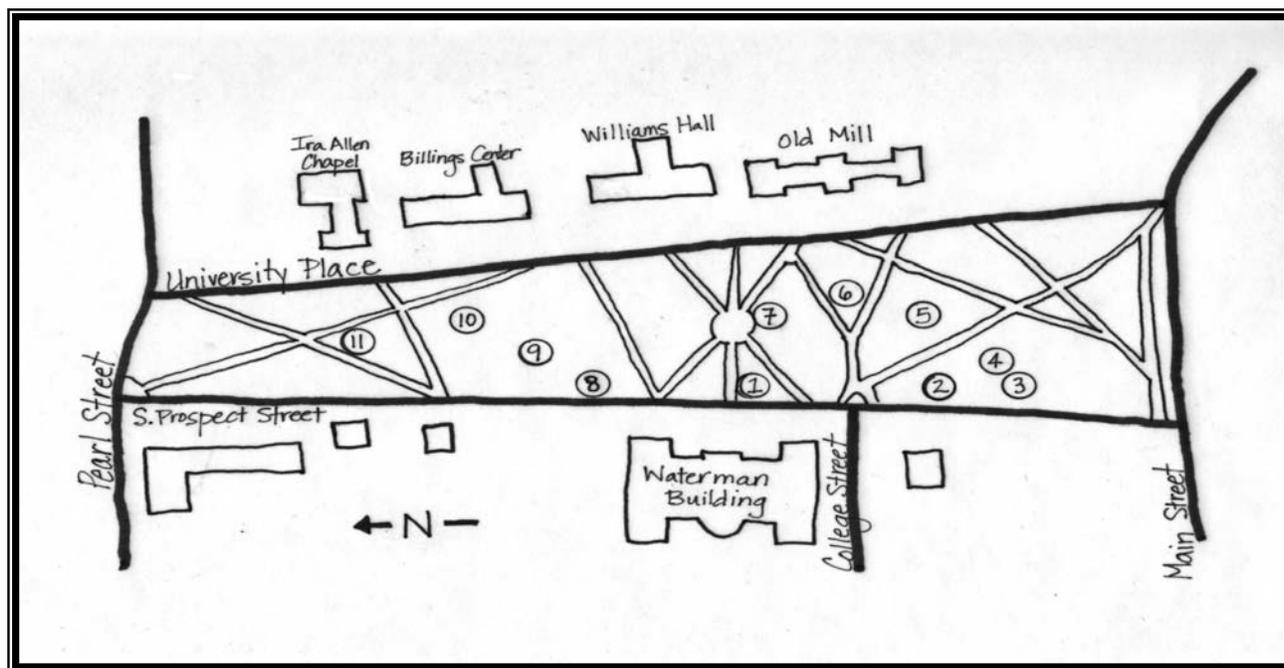


Trees of the UVM Green

For the 2008 tree walk, we revisited the campus green at the University of Vermont. In addition to the trees we learned last time plus a couple more, we are going to look a little closer and discuss some of the health issues trees face in the urban forest. Many of these topics are unique to the urban landscape, though as we will see, our urban and rural landscapes are well connected.

Enjoy your walk !



1. Silver Maple (*Acer saccharinum*) From the Green looking west (towards the Lake), we see a group of 3 Silver Maples. Perhaps the most common street tree of the maples, these are known for their tolerance of stressful urban conditions. Their leaves are in opposite arrangement, light green with a white/silvery underside and deep sinuses. The bark, especially on mature trees, tends to peel off in large scales. Naturally found along rivers and floodplains, these trees are tolerant of soils with little oxygen where the pore spaces in the soils are filled with water instead of air.

The center tree of this group displays a condition known as co-dominant leaders, or twin leaders. This is especially common in maples and some other deciduous trees. Co-dominant leaders often lead to what is known as included bark, where the bark of two branches grows against each other. Because trees grow outward, the branches continue to add pressure to the joint as they grow. Moisture can also collect and build up inside this region, leading to decay that can compromise the structure of the branch union and eventually cause failure.

2. Liberty American Elm (*Ulmus americana*) Once common in nearly every city, the history of this American icon is well known. The trees form large, vase shaped canopies that serve to shade many town and city streets. The leaves have serrated margins and uneven bases where they join the petiole.

The introduction of Dutch Elm Disease (DED) nearly wiped out this species from the American landscape. However, a few specimens survived. From these survivors, research and production efforts focused on selecting hybrids that have proven resistant to DED. These hybrids have been commercially available in the last few years. The Liberty American Elm is one of these varieties leading the Renaissance.

3. Pin Oak (*Quercus palustris*) A member of the red oak group, Pin Oak has deep sinuses and pointed lobes. The bottom pair of veins is also recurved, meaning they curve back towards the petiole. This species also displays an interesting branching structure. The upper branches angle upwards, branches in the mid-section of the tree grow straight out, and those on the lower portion tend to angle downwards. This gives us a visually appealing silhouette, especially in winter months.

This species can give us a quick chemistry lesson about the interplay of soil acidity and available nutrients. Pin oak are susceptible to iron deficiencies caused by soils that are too alkaline, or those with a higher pH. The leaves become yellow, a condition known as chlorosis. However, this does not necessarily indicate that the soil is deficient in iron, but that it is unavailable to the tree. It can be remedied by iron injections into the tree or altering the pH of the soil.

4. Scotch Pine (*Pinus sylvestris*) The Scotch Pine can provide a colorful element to the landscape. The needles are in bundles, or fascicles, of 2 and twisted, which is a key to easy identification. The upper part of the trunk along with the branches becomes a bright orange color, contrasting with the brown lower trunk.

A close look at some of the needles reveals an interesting white bump on them. This is a scale insect, probably Pine Needle Scale. These insects crawl onto the needle and insert their piercing/sucking mouthparts into the leaf. They grow a protective shell around their bodies while they feed on the sugars in the sap. These are often not fatal, but can be over time if populations increase enough. Because they are protected, control can be difficult. Dormant or Horticultural Oils have proven to be effective in controlling these pests.

5. Dawn Redwood (*Metasequoia glyptostroboides*) Unlike many conifers, this species drops its leaves in winter time. A cousin of the redwoods, it has flat needles that are 1 inch or longer.

Fossil records indicate this tree has been around for a while. Scientists long thought this species was extinct, until 1941 when a forester in China found a living specimen. This rediscovery spurred efforts to propagate this species and has given this dinosaur of trees a new life.

6. European Bush Honeysuckle (*Lonicera spp*) This group of four different species (Tatarian, Morrow, Amur, and bell) offer abundant flowers in the spring that can be white, yellow, or pink. The leaves are opposite arrangement and egg-shaped to oval. Cut a cross section of a twig and you will see either a brown or hollow pith that indicates its European decent.

This group of plants has fallen out of favor with many people involved with the Green industry. A walk through nearby woods, especially those near old homesteads and farms, will reveal many honeysuckle plants that have escaped cultivation and now threaten many of our wooded ecosystems. They are aggressive growers and crowd out many of our native species. They offer poor replacements in terms of wildlife food sources and habitat capabilities. As with most of the plants that are now deemed invasive, they were formerly widely planted in the urban landscape.

7. Crab Apple (*Malus sp*) Perhaps the most common flowering ornamental tree planted, these trees come in a wide variety of shapes and colors. They can be as tall as 25 feet, or less than 10 and the shape of a lollipop. These are easily identified by the showy flower display in spring and red fruit by the end of summer.

Though not demonstrated on these trees, this genus of trees, which includes eating apples and pears, are susceptible to a couple of diseases. The first is fireblight. This is a bacterial disease that causes branch and occasionally whole tree mortality. This disease causes leaves to wither and appear scorched. The tip of the branches also bends into the shape of a shepherd's crook.

Another disease is cedar apple rust. This disease needs two species to complete its life cycle- one is cedar and the other is apple. Orange fruiting bodies that give the appearance of orange fuzz can coat fruit and form spots of leaves. If the infection is severe enough, the crop can be rendered valueless or severely stunt tree growth.

8. Green Ash (*Fraxinus pennsylvanica*) As with the Silver Maple, this common species has been readily planted throughout the urban landscape because of its hardiness. The leaves of this tree are pinnately compound in an opposite pattern. Each leaf is composed of 7-9 leaflets. The bark is ridged and furrowed forming a loose diamond pattern.

As we look at these 2 trees, let us focus on the tree to the north. An examination of the base of the trunk will reveal a flattened 'side'. This is probably caused by a stem girdling root (SGR). SGR's form when a root grows in a circular pattern around the tree and constricts growth. As the root grows in width along with the stem, they both expand into each other and the trunk is girdled. Nutrients and water are prevented from moving up and down the tree and the tree declines. This may be the cause of the dead branches in the crown.

A new pest now threatens the ash tree. A beetle called the Emerald Ash Borer (EAB) was introduced to the U.S. through the Great Lakes States and has claimed millions of ash trees in the Midwest, from Chicago to Ohio. Efforts are underway to prevent or slow the spread of the EAB, though the threat is not likely to be extinguished.

9. White Pine (*Pinus strobes*) Here we have a group of old giants. This stately tree is the only pine in the east with 5 needles in each fascicle. All other pines around here have 2 or 3. The branches are sometimes described as bottle brush in appearance. The bark on mature trees is a dark gray blocky pattern.

In the middle of this group, we see a younger tree that has one main stem that separates into several leaders about 20 feet above the ground. This is due to an attack of White Pine Weevil. The weevil deposits eggs in the main stem of

the tree and when they hatch, the larvae hollow out the main stem and cause it to die. Several lateral branches try to become the leading branch and the tree ends up with several leaders.

10. Sugar Maple (*Acer saccharum*) The Vermont State Tree. Most Vermonters can't and won't picture the state without this species. The leaves have 5 lobes and are in an opposite arrangement. The bark is brown to dark brown. Grown in the urban setting, this species develops a dense canopy that prohibits all but the most shade tolerant species from thriving.

This group of older specimens demonstrates several issues that develop with trees of old age and also some specific to maples. Looking closely through the dense canopy and examining the tops, you will notice that several of the trees have had their leader die. This may be due to many factors. First, Sugar Maples do not handle the compacted soils that are often found in urban settings. They thrive in lighter, well drained soils. Many years of foot traffic through campus probably created a very compacted soil. The second possibility we may take note of are the large branches that are growing directly opposite of each other. When the branches reach these large sizes, they can effectively girdle the main stem and lead to branch mortality of the stem above that point.

Other signs that these trees are displaying are the fruiting bodies visible on some of the trunks. These fruiting bodies are signs of advanced decay within the tree. The decay is not necessarily a sign of eminent tree failure, though it should raise some alarms.

The Asian Longhorn Beetle (ALB) poses a grave risk to this tree as well as many other deciduous trees. An exotic beetle, it tunnels through the cambium layer of the tree and girdles it, preventing water and nutrients from being transported. Introduced through New York, New Jersey, and Chicago, control efforts are in place to minimize ALB's effects.

11. Norway Maple (*Acer platanoides*) A tree similar in many respects to the Sugar Maple, the leaves of Norway Maple can have 5 or 7 lobes. The leaves are also wider than those of Sugar Maples. The easiest way to spot this species is to pick a leaf. Norway Maples have a milky white sap that will ooze from the petiole.

Widely planted for its dense shade and toughness, this species, like the honeysuckle, has escaped city limits and threatens our forests and natural ecosystems. Because they are prolific seeders with high germination rates, this tree aggressively colonizes new sites and can completely overtake a forested site. Surveys have indicated that where established, Norway Maple seedlings outnumber Sugar Maple Seedlings on the order of several hundred to one. This has dire implications in forest settings where the next generation of trees is determined by intense competition of seedlings and not by able bodied landscapers and arborists.

For more information on Urban Forest Health:

Disease Identification

- University of Minnesota Extension- Plant Disease Diagnostics

<http://www.extension.umn.edu/yardandgarden/diagnostics/>

- Cornell University Plant Disease Diagnostic Clinic

<http://plantclinic.cornell.edu/>

Invasive Plants

- Vermont Invasive Exotic Plant Committee

<http://www.vtinvasiveplants.org/invaders.php>

Tree Stewardship

- SOUL- Stewardship of the Urban Landscape

<http://www.uvm.edu/~uvmext/programs/natural/forestry/soul.php>

Exotic Insects

- Emerald Ash Borer

<http://www.emeraldashborer.info/>

- Asian Longhorn Beetle

<http://www.uvm.edu/albeetle/>

- Hemlock Woolly Adelgid

http://www.fs.fed.us/r8/boone/resources/forest_health/hem_woolly.shtml



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