Tree Talk with Judson Scott

Conducting a Visual Tree Assessment

Step 3: Major Branch Junctions and Limb Attachments

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Performing a Visual Tree Assessment (VTA) requires investigation of the ground around a tree's root system, root flares and trunk. The next step is to evaluate major branch junctions. This article will detail the final steps in VTA of the tree itself: examination of major branch junctions, and finally, investigation of the limb attachments.

The Major Branch Junctions

Junction failure can cause large portions of a tree to fall, which exposes people or property to harm. In order to prevent harm, it is important to be aware of causes and signs of weakness that lead to junction failure. Most trees have healthy branch attachments with strong wood. Occasionally trees are damaged by ice, snow, or wind, that can weaken junctions and lead to failure. Other damaging agents that lead to failure are animals, human interferance, construction equipment and poor growth characteristics of some species.

One cause of weakness in branch junctions is decay. The decay process in a damaged attachment is called compartmentalization of decay in trees (CODIT). As wood decays in the branch junction, a hollow slowly forms, in which animals and birds make homes. When wildlife inhabits the tree, it is a tell-tale sign of decay. Hollows are nice for wildlife but they may lead to catastophe for people. Cavities in branch junctions require investigation to evaluate deterioration that can cause limbs to become unstable, in which case, the limb or the tree needs to be removed.

Grass, weeds, fungal growths or small trees growing out of the junction may be another sign of a larger problem. Investigate any growth in the junction area: it may be in a superficial crevice that holds dirt and allows rootage for the growth, but it could also be sign of a larger problem. A large fungal growth projecting from a decayed junction deserves a closer look and may necessitate the tree's removal.

An example of a bad limb junction.

For that matter any kind of growth projecting from a branch attachment should be inspected. Sometimes the decay process rots out the entire core of a tree and the only external sign is a small growth from the junction. A seemingly small area of dirt-like material, when it is probed with a small rod, may reveal a larger problem.

Some tree species that have dysfunctional characteristics can lead to failure. A good inspector should understand which trees are naturally prone to failure. Northern hackberries (Celtis occidentalis) and black cherries (Prunus serotina) are two examples of species that often posess too-tight branch junctions with included bark, a natural species flaw for these trees.

Included bark causes a tight junction, looking more like a "vee", than a 90 degree angle. This growth habit allows the bark to roll in on itself, therefore becoming "included". The presence of included bark is a sign of weak support in the junction because the wood cells are unable to bond together, instead forming a union with a crease. To understand what this crease looks like, consider the back of a human hand when the thumb is moved close to the forefinger. The formed crease and slight mound resembles a junction with included bark. When the thumb is moved away from the forefinger to a 90 degree angle, this resembles what a strong junction should look like.

One possible cure for a tree with included bark is the installation of cables for artifical support of the junction. The use of cables is an arboricultural process

About the Author

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which is regulated by the ANSI A-300 standards. Copies of this standard and others for tree care can be purchased from the International Society of Arboriculture (ISA) http://www.isa-arbor.com or Tree Care Industry Association (TCIA) http://www.natlarb.com.

Branch junctions with cracks extending vertically down from the "vee" of the main attachment are another VTA problem to look for. The tree pictured to the right has split and presents serious potential for harm. In fact, this crack extends all the way through the tree and actually splits horizontally across the grain, as well as vertically with the grain. Across-grain cracking is a serious problem.

Cracks like this one are often caused by a heavy weight, like snow or ice, or by a sudden wind load. Particular species are prone to this kind of cracking so it is important to know tree species characteristics! If a crack runs down from the "vee" of the attachment, the tree is prone to further failure.

Offering artificial support with a cabling system or installing bracing rods, bolting the tree together, may offer remedy to mild forms of this kind of cracking (although not recommended for extreme cases like the tree in the photo). Remember that these cables and bacing rods should be installed under the direction of a Certified Arborist! One common error that people make is assuming that once a tree has been cabled and braced it is "fixed"; in actuality, a cabled and braced tree should be routinely monitored for further decay and weakness.

The Limb Attachments

To finish the assessment of the structure of the tree, one must now investigate the limbs themselves. The large limbs that grow out from the trunk are called scaffold limbs. Many times it is a scaffold limb that will seemingly peel off the tree, presenting a potential for harm to anyone or anything below.

In general, the VTA technician will look for the same flaws in limbs as in other portions of the tree. The assessment will look at included or loose bark, decay, cavities, and the presence of pests and insects. Other conditions in limbs can be caused by the exposure to wind, ice, and snow. Finally, seemingly natural structural

A branch junction with a crack extending vertically down from the "vee" of the main attachment may present a serious potential for harm.

flaws may also leave a limb weakened and subject to failure.

Abnormal growth habits, such as a tree limb with an odd bend, should receive special consideration. During an inspection, such a limb should be carefully observed to determine if the limb can support its own weight. Other naturally weak growth habits are excessive end weight for a limb and a low crown-to-stem ratio. Proper VTA should assess whether the limb can support the weight or the torque put on these areas during weather events like high wind.

Limbs with cracks and seams, which may be a result of weather stresses from years before, also need special attention. These cracks can often be seen from the ground and should definitely be investigated. The presence of a crack may lead to a limb becoming what is commonly called a "hazard beam," which is a limb that may fail with little or no warning. Heavy, wet snow can cause a limb to crack like the limb in the photo on page 34. Once the limb cracks, decay enters and eventually weakens the limb and leads to its failure.

As with other parts of the tree, the presence of decay and/or fungal fruiting bodies is a telltale sign of potential for harm. When observed, decay merits further attention to determine the extent of the decay. This determination may require an Arborist to climb the tree to inspect the potential weakness. What must be determined is: Is the fungal growth a small, isolated growth or a sign of more extensive decay, creating a structurally unsound limb?

Old pruning cuts or topping injuries can also lead to potential failure. While the tree may have lots of foliage, the point where the old pruning or topping cut was made may have areas of decay which cannot support the lateral limbs growing from the cut area. After topping, the lateral limbs or suckers will grow quickly but be poorly attached to the main stem. The old pruning cut decays in the center of the topped stem, and the decay extends back into the stem leaving a thin layer of stem supporting a large sucker-growth limb. These suckers are easily separated from the decayed stem and can cause harm as they fall.

Loose-hanging, split or large dead branches should be removed, as they might detach or dislodge and fall. Even a small dead limb falling from a great height can cause damage when it hits a target below.

One final area requiring assessment is the presence of insects. A stream of honeybees flying in and out of the crown may indicate a cavity or hollow that is not easily seen from the ground. The bees can also present a hazard to children or tree workers who may climb into the tree. Hornets that inhabit a large paper nest in a tree may present a hazard to lawn workers and recreational users as well as to any workers who have to access the tree.

Another insect to watch for is the carpenter ant. A colony of ants trekking up and down the trunk may be an indication of larger areas of decay. Look to see where the ants are headed: are they alerting you to greater problems? If the ants disappear into a limb junction or a hole in the limb, there may be an internal area of decay that is not easily seen.

Watch this column next issue for a discussion of miscellaneous tree hazards and the targets they might hit. Also remember when in doubt, call an arborist for a consultation.