

By Guy Meilleur

'd like you to take a look at this big old tree that they designed a development around. It looks OK to me, but ..."

The town's urban forester was only asking for a quick assessment, so little did I know this would be the start of a 12-year relationship with a gentle giant. It was 1993, and in a weak moment I had volunteered to sit on the town's tree board. We made recommendations on the landscape ordinance and reviewed tree projects in and around the town. Rewards from this kind of volunteer work often come indirectly, paying off in unexpected ways for the time invested.

This old white oak was on top of a hill

Bleeding lesion in a furrow opposite from the open cavity, a sign of advancing decay.

and surrounded by houses under construction. The crown looked good, leaves waving like a green flag, so I went straight to job No. 1 for the tree assessor, a trunk and root collar examination.

Walking around the 8-foot diameter trunk, I saw signs of minor infections by bacteria or fungus, and infestations by woodboring insects. These problems appeared to be treatable, a yellow flag. Tapping on the trunk with a rubber mallet [see photo 1] produced a drumlike resonance. This sound was a red flag. The hole in a primary buttress root threw up the crimson flag. It was on the side of the tree facing the original farmhouse, which turned out to be a useful bit of history. I strapped on an ergonomic trowel or "hand plow" and dug away the loose debris, avoiding root damage. The flashlight beam shone on no large occupants, so I took a look inside.

Holy Hobbit Party! This was not a cavity; it was a cavern that needed exploring. Arboreal spelunking? There was no Resistograph locally available in 1993, so I clipped the end of a tape measure onto the end of my four-foot-long tile probe and shoved it into the open cavity. After some poking and wiggling, 6 feet later it hit semisolid wood. Another hole in the trunk was much smaller, so a longer metal rod was needed. It also measured about 6 feet of decay. Unlike a Resistograph or other advanced tool, this poking method does not do a very good job of measuring wood that is weakened by decay but still intact.

The cavity was well beyond the 70 percent "hazard tree" threshold, but the other buttresses seemed solid. An aerial inspection was carried out, inspecting the structure higher in the tree and checking the condition of leaves and twigs. No aggravating defects were found in the upper part of the tree, so removal was not recommended. Aggravating conditions in the lower part of the tree, the root zone, included soil compaction and other construction impacts around the dripline on the south and west side, and a cut to build the houses to the north and east. The owners, who lived to the south, wanted to know their other options, so a mitigation plan was drawn up and agreed on. I estimated that the tree could last safely for five or 10 more years, but gave no guarantees and attached a statement of Assumptions and Limiting Conditions. They got the contact information for three local competent arborists, but the owners asked me to do the work, so I transitioned from consultant to contractor.

Mitigation plan

1. Pest Control: Decayed areas were cleaned of frass and other loose material with carving tools. Air tools were not readily available then, so these areas were flushed out with water. Monitor semiannually and repeat per need.

2. Pruning: After the aerial inspection, the rope was left in the tree. A crown cleaning removed dead, dying and very diseased and damaged branches. Branches with minor defects like small cracks and little decay pockets and others with heavy ends that seemed prone to breaking, were thinned and reduced. Monitor semiannually and repeat per need.

3. Vertical and horizontal mulching: Situated on a hilltop, and with a history of raking, organic material had been constantly eroding from the soil. Plugs of soil pulled out with a soil probe showed a thin O and A horizons.

A pick was used to fracture the soil, and the holes packed with compost, aged pine bark, gravel fines and mycorrhizal inoculants. Four inches of hardwood chips were spread over the surface. Falling litter such as leaves and acorns were to be left in place, and any excess composted on site. Check and refresh annually.

1994

The tree looked a lot better the next year. There were more and greener leaves, and no dead branches showing. The pest attacks slowed, needing only a little attention in the next few years. The owners were encouraged that the work and prayers were paying off.

1996

A hurricane blew through at 70 mph after dumping 10 inches of rain. The tree stood strong, with minor tip damage. Three adjoining homeowners did not voice any concern, though their homes were close enough to get brushed if the tree failed. The neighbors to the west did not stand strong, however; they feared the next storm would topple the tree onto them. Their insurance company sent a letter warning the tree owners that they would be liable in case of damage. The owners' insurance company requested a followup inspection and report. A Tree Hazard Evaluation Form was included in a return letter documenting that the risk of failure was not unreasonable but that there was no evidence of it increasing. The report verified that ongoing care was mitigating that risk.

The neighbors and their insurance company were not satisfied, and demanded that the branches overhanging their property be removed. A compromise pruning plan was implemented; the reduction cuts were



Decay streaks down the sides.



A look inside: Holy Hobbit Party!

made at sound, mostly upright laterals. Enough foliage was left to keep the branches alive, but the needless loss in photosynthesis was considerable for a tree this size and age. The sudden exposure of the soil under these branches to sun and wind added another stressor to the tree system.

1998

Over time the drainage patterns on adjacent landscapes were altered, and water was directed through a pipe. The owner directed the pipe toward the stem to irrigate it from 10 feet away, but white oaks are not well adapted to heavy watering in the late summer. Their stomata are closed to conserve water, so an excess can lead to root decay. A Y-joint was installed so the water would flow in two directions along the dripline. If that is where the water drips from the branch tips, that could be where root activity is the greatest.

2001

Branches in the top and on the western side were dying back. In the course of inspecting and cleaning the crown, it was apparent that most of the leaves had brown blisters on them. The pattern matched pictures of ozone damage. No direct treatment for this condition was known.

2003

A new vertical crack showed up on the western side of the trunk. In it was a fruiting body of *Laetiporus sulphureus*, the same fungus found in the largest white oak

in the country, the Wye Oak. *Laetiporus* is a brown-rotter, meaning that it consumes the cellulose in the wood fibers but leaves the lignin. This fungal activity causes the wood to lose much of its flexibility while holding onto much of its strength. The owners were advised that the new crack and infection had increased the risk of failure. The load in the crown had been lightened by branch removal, which was a factor in the owners' decision to keep the tree, though it was clear to one spouse that it was time to start saying goodbye to the tree. Losing an historic tree is like losing a



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loved one, so the owners go through the same five-stage grieving process:

- Denial. "Oh, no! This tree looked fine when we bought the lot!"
- Anger. "Why didn't our builder check out the tree before he sold it to us! Why did they have to damage the roots so badly?"
- ► Bargaining. "If I do all the right things for this tree, it may last a good while."
- Depression "All my work and prayers were in vain. It hurts to lose this tree."
- ► Acceptance. "The tree's had a good life, and I am glad it was part of mine for so long. It's gone, so it's time to plan for a nice big magnolia in its place."

2005

A moist summer was followed by a severe September drought. The entire top is dead, so the whole tree is structurally unstable. A bleeding lesion on the side of the trunk opposite the cavity signifies advancing decay. One spouse sees all the green leaves on the lower limbs, so he still wants to keep the tree. The other



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Hollowed buttress root.

spouse recognizes the danger, and accepts the loss.

Making the call

The hardest job an arborist can face is assessing risk: deciding when and how to hold on to a giant old tree, and when to fold up the toolbag and tell it goodbye.

Utility right-of-way managers have one set of criteria for this decision, often summed up by the phrase "When in doubt, cut it out." If a high-value tree can be maintained safely by pruning rather than removal, this is often a cost-effective strategy. However, given their primary mission of keeping the power flowing, utilities tend to take out marginal trees sooner rather than later.

Public safety is a top priority for municipal tree managers, but they are also charged with the task of maintaining the public benefits that derive from a healthy urban forest. Many of their constituents put an especially high value on public trees, so conservation of existing trees is higher on their agenda in areas where residents speak out about tree care.

The commercial arborist typically deals with one landowner. On private property there can be a much higher acceptance of risk, for both arborists in their recommendations and owners in their decisions. This giant had no place standing next to a power line, and could stay in a public park only with special precautions. In a big back yard it lived on for 12 more years after receiving what may have been fatal construction damage.

Could this giant have lasted longer? Without the needless pruning and turf competition and the storm damage and the ozone and the severe drought it may have. The root damage during construction could have been avoided if the builder had worked with an arborist. More constant and intensive efforts to improve the soil afterward may have helped. If our company was closer, and organized and staffed to the level of a TCIA-Accredited business, the extra care may have resulted in extra years of safe useful life for the tree.

Now the tree is gone, and these lessons have been reinforced by the Mondaymorning quarterbacking. A portable mill will come on site and transform scaffold limbs into benches. It's time to focus on other tree work, like preparing this site for the magnolia that will take the giant oak's place. The owners will sit on sturdy oak



Looking up the cavity from the center of the tree.

benches as they enjoy their new giant-to-be tree. I can smell the blossoms now.

Guy Meilleur is with Better Tree Care in

New Hill, N.C. He will be presenting a discussion on this same subject, Tree Risk Assessment & Mitigation, at TCI EXPO in Columbus, Ohio, on Nov. 10.



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