



## RETRENCHING HOLLOW TREES FOR LIFE

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### *What is retrenching, what's it got to do with tree care, and why should I care?*

I'm glad you asked! Dictionary definitions of 'retrench' include: To live at less expenses; To confine, limit or restrict; To cut off, pare away; To reinforce. The term has been used in literature and in relation to trees and their care in Great Britain since the 1700's.

### *What do European standards say? They've been at this longer than we have.*

England's BS 3998: "Retrenchment pruning is a phased form of crown reduction, which is intended to emulate the natural process whereby the crown of a declining tree retains its overall biomechanical integrity by becoming smaller through the progressive shedding of small branches and the development of the lower crown (retrenchment). This natural loss of branches of poor vitality improves the ratio between dynamic (biologically active) and static (inactive) mass, thus helping the tree as a whole to retain **good physiological function**... The pruning should be implemented by shortening heavy, long or weakened branches throughout the crown, while retaining as much leaf area as possible and encouraging the development of new secondary branches from epicormic shoots or from dormant or adventitious buds."

Germany's ZTV standard: 3.1.9: Focus on habit and physiological requirements.

3.1.9.1, Regenerative Pruning: Trees showing significant signs of aging in the outer parts of the crown and the development of a secondary crown are to be cut back as far as necessary (crown reduction). 3.1.9.2: Crown part reduction: Individual branches are to be reduced in accordance with safety requirements and/or the surrounding tree environment. If necessary, areas surrounding the sections that have been reduced may require thinning to establish symmetry (and light penetration to inner foliage). 3.1.9.3: Crown reduction: The entire crown is to be reduced in height and/or spread, for safety or site needs. The extent of crown reduction is specifically dependent on the species and growth habit, and shall be <20%...Vigorous sprouts must be thinned and/or reduced. Cuts must be made above the old pruning wounds, avoiding damage to woundwood. As a rule, repeat every 3-5 years. Form a secondary (reiterative) crown over time.

### *What does the ISA BMP on Tree Risk Assessment say?*

"Tree risk assessors should resist the ultimate security of risk elimination based on tree removal and consider possibilities for retaining trees when practicable... Over-mature trees in natural settings may reconfigure as they age and deteriorate, a process sometimes called '**natural retrenchment**'. They may continue to grow trunk diameter while branches die and fail—reducing overall height of the tree and **increasing stability**. Where tree risk is a concern, tree risk assessors can imitate this process by recommending crown reduction." (page 43)

*Is retrenching a tree in a mortality spiral the same as 'topping'?* Let's compare these two practices:

\*Please make the below a chart or table, to optimize the comparison\*\*

#### RETRENCHMENT BY CROWN REDUCTION

#### TOPPING

Retains enough foliage to maintain tree health	↔	Removes too much foliage, starving the tree
Releases gradual sprouting from interior nodes	↔	Forces panic sprouting internodally or near wounds
Endocormic growth from dormant (preexisting) buds is well attached, with buttressing at base of sprouts	↔	Epicormic growth from adventitious (newlyformed) buds is weakly attached, with no buttressing
Smaller wounds where tree can compartmentalize	↔	Large wounds at poor locations, causing rapid decay

### *If retrenching old hulks requires heading cuts, doesn't that make it wrong?*

For young trees to grow as large and fast as possible, 'heading' cuts to small laterals or buds are only made on temporary branches, while reduction of permanent branches leaves a lateral large enough (~1/3 diameter or greater) to assume apical dominance and spur outward growth. For mature trees, growing outward is not the objective. Maintaining health and value while lowering risk is what we are after. Other rules of thumb apply, such as: "Size can be maintained most effectively if the plant is pruned as it starts to reach the acceptable size" and "(If the lateral remaining is <1/3), the lateral should be fairly **upright** (>60% from the horizontal)." Harris et al, *Arboriculture*..

### *What if the tree is in a mortality spiral, on its last legs, ready to go, an imminent, severe risk?*

Dieback in a once-beautiful tree can be ugly and depressing. It's seen as a spin in a mortality spiral, leading to removal and replacement. Inflicting 'death with dignity' is simpler than the uncertain task of revitalizing health, stability, and value, but "Old trees that are of low vigor and have failing branches can often be kept healthy and attractive by removing the weak-growing and dying limbs in their extremities, particularly their tops." Mindful of the long-term processes involved, arborists can think in 'tree time', and choose conservation over condemnation.

### *Isn't retrenching geriatric trees the same as restoration?*

Not exactly. "Restoration: selective pruning to redevelop structure, form and appearance of severely pruned, vandalized, or damaged trees." (A300 Part 1) But old age isn't really damage, and restoration indicates that the tree will grow back toward its previous dimensions. Retrenchment is a natural process. Retrenchment pruning selectively develops a **new and smaller** structure, form and appearance. Both processes develop over time, but a retrenched tree is not expected to approach its mature dimensions. As Ted Green put it, the tree is **growing downward**.

### *Does retrenching hollow trees fit in with Basic Tree Risk Assessment?*

"As a professional arborist, you demonstrate competence and trustworthiness by looking at the trees' strengths as well as their weaknesses... Cavities greater than two-thirds of the diameter are sometimes considered "hazardous" and a reason for removal, but with close monitoring and care, trees with cavities greater than 80 percent of the diameter have been managed for many years... while decay is spreading on the inside of a tree, the development of **woundwood can compensate**, in part, for some of that loss of strength... Decay can be compartmentalized by a tree with adequate resources. The risk from decay may be lowered over time by managing the soil to increase those resources."

Recent tree risk training focuses on the tree's response growth, and its adaptations such as corrected leans. (It's the tree's future at stake, so it's only fair translate its body language. There are 4 lines where **Mitigation options, and the Residual risk** following each, can be listed. For instance, reducing the crown of a moderate-risk tree would leave a low residual risk. A 15% reduction can increase the stability of a branch 7 or a tree 8 by 50%. Improving soil structure, fertility and drainage would result in an even lower residual risk. Comprehensively consider all reasonable options. Lessen liability concerns. Sustain tree assets. **All we are saying:**

## **Give Trees a Chance!**

### ***Does retrenchment pruning go beyond the ANSI A300 Tree Care Standard?***

No. Retrenching is 100% within the A300, when the objective is established, the requirements or “shalls” are met, and specifications are communicated. Standard Operating Procedure:

SCOPE: An oak that is 6’ wide at the base. ~5’ of that is hollow. Extensive root damage.

OBJECTIVE: Reduce the load and the risk by retrenching the crown. Lower maintenance.

SPECIFICATIONS:

1. Remove all dead branches >1” diameter.
2. Reduce downward and horizontal segments of overextended branches, clearing the branches below by 2’-4’. Cuts <3” to upright laterals, <8% total foliage
3. Thin crowded branches back to the collars. <4% total foliage, <3” cuts
4. Reduce declining leaders 3’-6’. Smallest cut possible, near vigorous growth or buds.
5. In an area between 3’ and 20’ from the trunk, use air/water tool to make holes 18” apart, >2” wide and >12” deep. Force 50% compost/50% soil conditioner under pressure into the holes, in effect brewing compost tea on site. Mulch with 2” woodchips.

### ***How serious a defect is interior decay? This thing’s rotten to the core, and look at the bugs!***

When interior decay is noticed, non-arborists who never took Biology 101 react with shock and horror. Arborists understand that **taproots naturally shrivel up and decay**, as the buttress roots deny them air and water while taking over the support function. The dead taproots are shed, and decay moves up to digest the metabolic waste that was dumped in the heartwood. This affects the value of the log as timber, but the landscape value of the living tree remains. Whether and when and how much this interior decay affects stability is anybody’s guess.

### ***What about the 1/3 Rule for trunks? If 2/3 of the trunk area has decay, isn’t it a high risk?***

In 1996, Lothar Wessolly assessed 2096 trees and reviewed the data behind that rule, concluding “The size of the actual cavity (alone) provides no information on the safety of the tree. The transfer or generalization of this diagram to street trees is **scientifically inadmissible**.” (*How Hollow may a Tree be?*)

In 2006, Jerry Bond took a good look at the research data on trees that seemed to support this Rule. First, he found no data for applying this rule to trees >36” dbh. **None**.

Second, **the Rule ignores height, wind exposure, species** and other factors. Bond’s conclusions: “The ratio  $t/R < .3$  can no longer be used by itself as an index of trunk failure potential. Trees can tolerate extremely large amounts of internal decay without necessarily incurring adverse effects on their stability.” (*Foundations of Tree Risk Analysis*) Physicist Frank Rinn, developer of the resistograph, calls overreliance on this 1/3 Rule “**Voodoo**”.

### ***Look at the decay in the sinuses of this train wreck? How bad is it?***

Sinuses are concave areas between supporting tissue, such as buttress roots. Sinuses are wounded as the bark of the spreading buttress roots folds inward, just as bark in codominant branch unions gets ‘included’. Sinuses degraded by microbial or insect activity should be cleaned and treated. Since the buttresses support the tree, sinus problems are typically not structural problems. Decline over time can divide the buttresses, which then function as independent vascular streams. Many trees in Europe aged 600 years and more have room inside for a dozen people to dance, and a good poker game, too.

### ***What about target rating? Kids walk under this hollow tree. It’s a ticking time bomb!***

Children are generally kept inside during storms, dropping the occupancy rate of the target near zero at those times when trees are prone to fail. From the BMP:

“The following items should be included in a detailed written report...**occupancy rates**... In considering risk and mitigation measures, **tree risk assessors should communicate the benefits of trees** as well as the consequences of losing them.

Guidelines should be considered a starting point and should be modified as needed so that they are appropriate for the tree and site. While ‘likelihood of failure’ guidelines are presented for individual defects and in several cases, multiple defects; it is essential to consider all of the aggravating factors as well as any **mitigating factors such as adaptive growth** in the tree.”

***Where's your data on retrenching decrepit hulks? What research can you cite?***

Formal research on crown reduction of mature trees is nonexistent. Their unique nature and the many variables involved make controlled replication impossible. When asked "How can this tree be pruned so it is safer?" we used to say what we would NOT do: top the tree, or make "heading cuts". To small laterals or buds. We can instead remove big limbs to the collar. Assessors commonly measure the hollows at big pruning wounds, apply faulty formulas, and condemn the trees. Let's not kill more trees with pseudoscience and 1/3 rules. Published guidance on pruning older trees is scarce in the US, so one must look abroad. 11, 12 Respect your elder trees. Send positive messages about tree care, and the tree care industry!

***Ummmmm...I'm still not sure that retrenching hollow trees is a good idea!***

That's ok; thanks for listening anyway. Pictures of hollow trees sent to [bettertreecare@gmail.com](mailto:bettertreecare@gmail.com), will earn a no-obligation, free consultation. There's nothing to lose, except more good trees

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