



Retrenchment pruning: A technique for managing Veteran Trees



In this late mature tree you can see the original branch frame work forming the top two thirds of the crown.

But it also has a new lower crown that has developed more recently.



In the upper parts of the tree you can see dieback at the ends of the branches.

This is caused by limitations of crown size which triggers epicormic growth in the lower crown. This crown reorganisation is called crown retrenchment.

Retrenchment is a natural part of the aging process in an old tree.



Dieback promotes the growth of new shoots below the original crown.

The mechanisms that can cause this include:

- Alterations to the hormone balance in the tree
- Hydraulic capacity
- Changes in light intensity
- Wounding



Close up of the lower part of the crown showing limbs originating as epicormic growth that is perhaps 15-20 years old

This is a natural response of the tree. Perhaps it was pruned some years ago by the farmer?



Here is an nother example of natural retrenchment.

Here the dead ends of the branches in the upper crown are no longer present but the crown is obviously smaller than the maximum extent it once reached at maturity.

The tree has a clear lower crown.



This is the same tree as the previous picture, taken one year later.

The entire upper crown has been lost in a storm, but the fact that the tree had a vigorous lower crown means that when this happened the tree was still able to survive.

If we can mimic natural retrenchment to promote a lower crown, then we can remove upper branches if they are considered likely to fail.



Lapsed pollards can present particularly difficult problems.

Heavy branches on the heavily decayed and hollow trunks of these trees have the potential to fail, and when they do, they can pull the whole tree apart.



Lapsed pollards often only have leaves high in the canopy, with no lower crown.

Heavy pruning may be desirable to reduce the chance of major limb loss but is highly likely cause decline or death because of the small amount of foliage that would be retained to support the tree.



In contrast this ancient pollard has a crown structure that is unlikely to have structural problems, if managed

It has small vigorous limbs on a large diameter stem. The prospects for longevity are good.

Retrenchment pruning by tip pruning



The aim of retrenchment pruning is to initiate or promote the development of a lower crown.

There is no reduction in tree height or crown extent.

Retrenchment pruning is not intended to manage immediate structural issues.

Tip pruning pruning – how to do it?



Only small cuts are made, removing short sections of peripheral growth using hand tools.

A proportion of the terminal buds are removed.

The accompanying thinning at the crown periphery allows light into the interior of the crown.

Ideal tree response after tip pruning



Ideally the response to this pruning will be the stimulation of growth from dormant buds lower in the crown.

However, it may take some years before these shoots are initiated and it will be years before this growth can sustain the tree.

Undesirable response to tip pruning



Frequently the response to tip pruning is the creation of shoots close to the point of cutting. This is especially the case where the pruning cuts are too large.

This is not ideal because at some point these will need to be removed during subsequent management of the structural issues.

Retrenchment aims to initiate and promote a lower crown.

A long-term Management Plan



Structural issues mean that a veteran tree is likely to require extensive crown management to ensure longevity.

The dotted red line in this example indicates one possible crown scale that might be sustainable over the long-term, involving a height reduction goal of 8-10 m.

The appropriate path to achieve this scale of crown reduction may be different for each of the individual functional units.



Unit 1. Lower lateral branches have already failed naturally, or perhaps the upper one was pruned. No work required. The tree has naturally achieved the reduction required for long-term viability and has responded well, producing new live growth.



Unit 2. It may be possible to achieve the long term management goal by carrying out the 8-10m reduction in one step.

Sufficient low crown growth has developed naturally to support the functional unit following pruning for this section of the tree.

Structural issues are addressed with one operation without threatening the viability of this functional unit. However it will result in very large wounds.



Unit 3. An old pruning wound has resulted in a significant structural problem. Insufficient low growth means that an 8-10m reduction cannot be achieved in one stage.

The severity of the structural problem threatens the viability of the tree because if it fails it will have a negative impact on the other functional units.



Unit 3. Thus a compromise might be required for this section of the crown, involving reducing it in two stages.

The first stage may be a reduction of 4-5m to the solid red line to reduce the liklihood of short term failure.

This may be followed by tip pruning of the regrowth to encourage the development of a lower crown. If successful a second reduction may then be possible, to reduce it to the dotted red line.



Unit 4. This functional unit does not have enough lower growth to allow a reduction to the long term target of 8-10m without risking killing this section of the tree.

Retrenchment will involve tip pruning over several cycles, to promote lower growth before any weight reduction is possible. Successive pruning restores light to the lower crown and manipulates apical control to allow shoots to develop into limbs, over several decades.



Targeting management at individual functional units, means that the tree can have an asymmetrical appearance for decades as the crown is reorganised towards the long-term desired structure.

Whilst unit 4 is exposed, it is only possible to tip prune this section of the crown because the structural condition is not so bad that it requires the approach that was considered necessary for unit 3.



During the successive cycles of tip pruning on unit 4 it may be possible/desirable to begin to reduce the upper crown of this functional unit, to manage its structural issues.

This decision would be a compromise, similar to that taken during the management of unit 3.



Tip pruning of units 3 and 4 aim to initiate the development of a lower crown.

Subsequent management aims to encourage the development of these epicormic shoots into a framework of low branches.

Once a lower crown has developed then the target height reduction can be considered because the tree has sufficient foliage to support the corresponding functional unit.





This has been adapted from a presentation given by Paul Muir to the Kletterforum (climbers forum) at the Deutsche Baumpflegtage (German Tree Care Conference) in Augsberg 2018.