Pruning for Quality
A National Forest Guide

By Simon Greenhouse, National Forest Company

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‘Creating, through working partnerships and with community participation, a new 200 square mile multi-purpose forest for the nation in the heart of England’
Pruning for Quality

There are many different reasons why woodlands are being created and managed in The National Forest. These include nature conservation, as part of farm diversification, for recreational purposes or for the production of timber.

Sometimes timber production is not regarded as a priority – the financial returns seem to be too far away to comprehend or to benefit from. However woodland can, and does, provide a valuable timber crop that increases in volume and potential value every year. Many tree species, especially hardwoods (broadleaved trees) and specialist trees (such as poplars), command high prices when they produce quality timber. In order to produce quality timber, trees will need to be managed and, in the early years, pruned. Just like agricultural produce, be it grains, vegetables or livestock, neglecting a timber crop will result in it failing to achieve its full potential.

Managing a woodland for timber not only increases the wood’s economic viability but can also benefit wildlife and make woodland more attractive. It can also significantly increase the wood’s market value. A well-managed wood should be regarded with a justifiable sense of pride – a prized asset for present and future generations.

Pruning trees does require consideration and care. This guide looks at some frequently asked questions and answers to help make the job clearer.

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1. **What are the reasons for pruning?**

Different situations demand different reasons for pruning:

- **safety** - mature trees in an open setting with public access may need tree surgery to remove potentially dangerous limbs
- **amenity** - specimen trees may benefit from pruning to improve their appearance e.g. parkland or avenue trees
- **access** - over-hanging branches may need to be removed in order to facilitate access for vehicles, horse riders etc
- **fruit** - orchards require specific techniques for fruit production
- **timber** - formative pruning to shape a potential timber tree

It is the latter, *pruning for timber*, that these notes concentrate on.

2. **Won’t all trees become timber trees if left long enough?**

No, big does not necessarily mean valuable.

Growing quality timber depends on the following criteria:

*Species choice  *Tree genetics  *Site conditions  *Woodland management

After planting, management of the woodland is the opportunity to influence tree growth. After the establishment phase this will involve pruning to shape the trees and, later, thinning to create enough space for the best to grow.

3. **Why is there a need to prune?**

Most trees are planted at 2250 trees per hectare. Planting at this density means that the canopy should soon close, which will suppress ground vegetation and shorten the maintenance period. The trees will then draw each other up, accelerating upward growth, creating straight trees. However some trees will inevitably develop forks and coarse lateral branches. If left, these will develop into large limbs, essentially reducing the timber potential of the tree *(See Figs 1 → 4)*

**Formative pruning is the removal of these branches at an early stage.**
Fig 1: Unpruned young Ash
Fig 2: Triple forked mature Ash
Fig 3: Unpruned young Oak
Fig 4: Branchy mature Oak
4. Why bother.....?

- timber trees have such a long rotation (Poplar 20 – 30 yrs; Cherry and Walnut 40 – 50 yrs; Ash 70 yrs+; Oak 100 yrs+)

Maybe, but there is only one chance to get it right (i.e. in the early years of growth). Five-year-old Poplar plantations in The National Forest are already being thinned and marketed and the first walnut trees to be planted here are only 30 years away from maturity.

- returns in timber sales seem to be only average at the moment anyway. There is always a good price for quality.

Fig 4 Firewood grade £10 -£30 / cubic metre felled, at roadside

Figs 32-35 Planking grade → £225/cubic metre felled, at roadside

- It is bound to cost! Not if you do it yourself. Think of it as an investment. If the trees are not pruned then there maybe lost future income. Pruning operations can increase the value of a broadleaf crop by between 5 and 20 fold.

5. What do I need to prune – surely not every tree?

- Take a typical National Forest Tender Scheme site of 20ha. This might have 25,000 trees but only a fraction of these will need pruning (see Table 1 overleaf)

- As a general guide, aim to prune about 200 to 400 trees per hectare (i.e. one tree every 7 to 5 metres)

- Oak and Ash are the two main long-term timber producing species and both benefit greatly from formative pruning while young (See Figs 16 → 20). However not every tree needs to be pruned – just the best (i.e. the most vigorous of good form). It is a matter of ensuring that there are enough trees in the wood that have the potential to become the (valuable) final crop, whilst not wasting time pruning poor quality trees.

- Poplar and Cricket Bat Willow are commercial crops harvested on a short rotation (about 20 years old) and need lateral branches removing in order to keep the lower half of the stem branch-free (See Figs 25 & 26)
• **Wild Cherry and Walnut** have the potential to produce valuable timber if they are pruned correctly. *(See Figs 5 → 10)*

• **Sweet Chestnut, Lime, Beech and Sycamore** are occasionally planted in the Forest. On the right sites these may have timber potential and pruning the best will be beneficial.

• All the other broadleaf species (Birch, Field Maple, Alder, Willow, plus all the woody shrubs) are not grown for timber and do not require pruning.

• **Conifers** naturally grow with a single leading shoot that rarely forks. Their lower branches become shaded out and will ‘self-prune’ before they reach any size – so conifers do not require pruning.

• Even on a commercial forestry site it is beneficial to leave some unpruned trees for wildlife and aesthetics, e.g. on the woodland edge and ride sides.

**Table 1 : What to prune - a typical Tender Scheme woodland**

<table>
<thead>
<tr>
<th>Area (ha)</th>
<th>Tree numbers</th>
<th>Prune?</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Conifers</td>
<td>5</td>
<td>11,250</td>
<td>X</td>
</tr>
<tr>
<td>Woody Shrubs</td>
<td>1.5</td>
<td>3,400</td>
<td>X</td>
</tr>
<tr>
<td>Birch, Maple, Alder, Willow, etc</td>
<td>2</td>
<td>4,500</td>
<td>X</td>
</tr>
<tr>
<td><strong>Wild Cherry, Walnut</strong></td>
<td>0.5</td>
<td>550</td>
<td>✓</td>
</tr>
<tr>
<td>Poplar</td>
<td>5</td>
<td>800</td>
<td>✓</td>
</tr>
<tr>
<td>Oak and Ash</td>
<td>2</td>
<td>4,500</td>
<td>✓</td>
</tr>
<tr>
<td>Open Ground</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>20</strong></td>
<td><strong>25,000</strong></td>
<td><strong>Total pruning = c. 2,000 trees</strong></td>
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6. **When do I need to start pruning?**
Formative pruning is usually beneficial from about four years old. Because of the rate of growth in poplars, they should be pruned annually from Year 2. The longer pruning is delayed then the bigger the branches become - the bigger the tools that are needed to cut the branches - the bigger the task - the bigger the cost - the bigger the wound and the bigger the knot in the timber .....and therefore the smaller the income from timber sales (See Fig 36)

7. **What time of year?**
The optimum time to prune hardwoods is during mid- to late- summer. It is during this time that the trees are at their most vigorous, plant sugar levels are the highest and callus tissue forms quickest (See Fig 23)

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✓ Optimum time to prune broadleaved trees
= Mid-June → Mid-September
(Cherry, Walnut, Sycamore, Oak, Ash, Poplar, Cricket Bat Willow etc)

✓ Ash, Oak and Poplar can also be pruned in Jan / Dec
✗ Avoid pruning trees in Spring and Autumn

8. **How?**
- Remove forks and favour a single leader (usually the strongest, straightest and most dominant) (Fig 11)
- Produce a clean cut (See Fig 15)
- Respect the natural defences of the tree. Avoid cutting through the 'bark ridge' or the ‘bark collar’ which form at the interface between fibres of the branch and those of the trunk. It is from this point that the healing callus tissue forms. (See Figs 23, 24 & 28)
- Remove large branches (those that are bigger than 50% of the diameter of main stem) - ideally before they reach 4 or 5 cms in diameter
- Remove the weight of large branches before final cut (Fig 22)
- Leave two thirds or up to one half of the live crown to maintain the vigour of the tree
Figs 5 → 10:

Pruning a five-year-old Wild Cherry with secateurs and hand saw

Support the weight of the branch with the other hand, pushing it gently away from the cutting blade as you cut.

Note the position and angle of the pruning cuts.

Cherries should only be pruned in June/July/August to safeguard against disease.
Formative Pruning of Young Woodland Trees (4 – 10 years old)

ASH

Fig 11: Remove forked branches
- Common in Ash. Remove all but the straightest, most vigorous leader

![Diagram showing removal of forked branches]

Fig 12: Cut back dominating branches by about a third
- By not removing the branch completely, the tree is less likely to produce a ‘whippy leader’. Remember the tree needs some leafy branches to grow.

![Diagram showing cutting back dominating branches]

Formative Pruning of Young Woodland Trees (4 – 10 years old)

**CHERRY**

Fig 13: Remove coarse branches
- Remove lowest whorls (ring) of branches in successive years
- Remove lowest branches before they get bigger than 3cms diameter
- Don’t forget to only prune Cherry in June/July/August

![Diagram of cherry pruning](image1)

**OAK & BEECH**

Fig 14: Remove dominating branches
- Remove either the offending branch or the weakened leader
- Remove some of the small lower branches to encourage upward growth

![Diagram of oak and beech pruning](image2)
Fig 15: The Pruning Cut

- **a** Aim for a clean, precise cut, avoiding tearing the bark down the stem
- **b** A slightly angled cut will produce the smallest wound area
- **c** Do not leave ‘stubs’
- **d** Cut close to the main stem but avoid cutting into the ‘bark ridge’ or ‘bark collar’ (See Fig 24)
Fig 16: Forked Ash

Fig 17: That’s better!

Fig 18: Oak before...

Fig 19: ...& after

Fig 20: Pruning cuts on Oak

Fig 21: Unpruned Walnut
Fig 22: Cutting larger branches

Correct sequence of cuts

Incorrect cut

Fig 23: Callus growth

Healthy callus formation

Stubs prevent healthy callus formation and may lead to the onset of decay

Fig 24: Recommended position of pruning cut

Recommended position of final cut

‘Branch bark ridge’

Internal meeting zone of main stem and branch

‘Branch Collar’
Fig 25: Poplar ready for next pruning

Fig 26: Recently pruned Poplar plantation

Fig 27: Pruned 10-year-old Wild Cherry

Fig 28 above:
Longitudinal section of a Sycamore log
Note the interface of stem & branch fibres, and where the heart of the branch has started to decay
9. What tools?

- Branches up to the thickness of a finger can be cut using secateurs and this is the easiest, quickest and most effective method of pruning young trees. A decent pair of secateurs will cost about £40.

- Larger branches will need to be cut with a handsaw.

- For larger, more widely spaced branches (e.g. on poplar) loppers may be more convenient.

- Pole saws are used for anything above head-height. When using pole saws be aware of the dangers of electrocution from overhead power cables.

- Local stockists of pruning tools in The National Forest area include R Massey & Son Ltd, Woodville (see back cover for details on where to source an extensive range of pruning tools including secateurs, saws and loppers).

10. What are we aiming for?

- Straight stems, with no branches for about 5 metres.
  - The timber potential is restricted to the bole or butt of the tree, i.e. from ground level to the first main branch. (See Figs 32, 33 & 38)

- The highest possible quality.
  - Top prices are paid for defect-free logs that can be peeled to form sheets of decorative veneer.

Fig 29: Ten-year-old mixed woodland, recently pruned
Fig 30: 15-year-old mixed broadleaves

Fig 31: Mixed quality Ash stand
(note the forked Ash in both pictures)

Fig 32: Prime Ash

Fig 33: Veneer quality Oak
Fig 34: High quality Ash plank

Fig 35: Blemish-free Oak

Fig 36: Low grade timber. Note the large ‘live’ and ‘dead’ knots

Fig 37: Only quality timber will make it to the sawmill
Fig 38: High-pruned oak – a high quality timber tree
Silky have built up a worldwide reputation for being the best pruning saws you can buy. Their extensive range includes folding pocket saws, sheathed saws and telescopic pole saws (with or without a lopper accessory).

For further information and a brochure please contact Silky Fox Handsaws the sole UK importer. Their website shows pictures of all pruning saws and has a list by county of local stockists.

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