

Managing veteran trees in historic open spaces: the Corporation of London's perspective



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The three Corporation of London sites described in this chapter provide a range of situations for ancient tree management.



Epping Forest.
Pollarded beech.
(Photograph:
Corporation of
London).

Management of the ancient trees

Burnham Beeches is an old wood-pasture and heath of 218 hectares on acid soils containing hundreds of large, ancient, open-grown *Fagus sylvatica* L. pollards and some *Quercus robur* L. and *Quercus petraea* (Mattuschka) Liebl. **Ashted Common** is a site of 200 ha on acid soils and heavy London Clay on which there are over 1300 ancient *Quercus robur*. **Epping Forest** is an extensive old pasture woodland of 2500 hectares stretching 20 km north to south across a gravel ridge and slopes of London and Boulder Clays. It encompasses around 45 000 veteran *Carpinus betulus* L., *Fagus sylvatica* and *Quercus robur* pollards within a mosaic of extensive grasslands and small heaths.

As a significant proportion of the UK's total number of ancient trees, the veteran pollards of the three areas represent an internationally important wildlife feature. More than this, they also represent an extraordinary historical and cultural inheritance. It is in this context that a number of management priori-

ties have been set. There is a need to:

- understand historic management practices (see Dagley in press and Read in press)
- identify and re-find the individual trees and monitor their state of health
- prolong the life of the trees by management where deemed possible
- assess risks that may be associated with ancient trees in particular locations
- foster a wider appreciation of these trees and their historic landscape
- create a new generation of trees of equivalent wildlife value and interest

This chapter reviews the monitoring and management techniques that have evolved over the last ten years or so.

INVENTORY AND SURVEY

Tagging. At Ashted 2237 *Quercus robur* pollards, including around 900 dead trees, were tagged and photographed between 1994 and 1996. At Burnham 555 pollards have been tagged, most between 1986 and 1990. At Epping Forest 90 *Carpinus betulus*, 50 *Fagus sylvatica* and 200 *Quercus robur* have so far been tagged.

TAGGING SYSTEM (Fretwell & Green 1996)

Serially numbered tags: galvanised metal rectangles 2.5 cm x 4.3 cm with drilled holes for nails	Nails: 7 cm long stainless steel or aluminium - hammered into bark to 3 cm depth to allow for tree growth	(steel nails are not used on trees where a chainsaw may be used near tags - eg maiden pollards)
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Mapping, GPS and GIS. Some GPS work has been carried out by a consultant in some of the compartments at Ashted Common. The maps have revealed distributions of the ancient *Quercus robur* pollards there that could not be discerned from aerial photographs (**Figure 1**). The new distribution maps will allow a clearer strategy for prioritising areas in which new pollards could be created or natural regeneration promoted (Smith 2000).

At Epping Forest similar GPS and GIS work has been undertaken. However, with many thousands of veteran trees the mapping has had to be selective. The key areas selected include minimum intervention

areas, areas with a known rare insect fauna and areas in which pollard health is of particular concern. In addition to this inventory work GPS is being used for the monitoring programme on the *Carpinus betulus* pollards that are being cut and for the crown reduction work on the *Fagus sylvatica* and *Quercus robur* pollards.

At Burnham the pollards are found across 80 of the 213 hectares and a general distribution map was made prior to GPS (Read *et al.* 1996). This has allowed the cutting work planned for the period 2000 to 2006 (see 'Management Objectives' below) to be strategically spread across the site each year. A GPS map has been accomplished since with all living pollards mapped.

Photographic recording. At Ashted a single photograph, as a minimum, has been taken of each *Quercus robur* pollard. For particular individuals two photographs from different aspects were taken. These photographs are held in the ring binder files with the datasheets.

The same approach has been taken at Burnham Beeches with extra photographs taken following significant events such as storms or active management. Although so far only employed at Burnham Beeches, fixed point photography is planned at all three sites in the future, using GPS in some cases. Digital cameras are also to be used and a digital archive is being developed at Epping Forest.

MONITORING

National Recording forms. Over the last ten years the recording and monitoring of ancient trees has developed considerably in the UK. One result has been the production of national survey forms. These were developed by the Ancient Tree Forum in partnership with English Nature (a government agency). There is a form for recording and registering ancient trees anywhere in the landscape and a more specialist recording book for trees being studied in greater detail at particular sites (English Nature 1997a and b).

Site-based monitoring forms. The national forms were influenced by recording work carried out at the three Corporation sites. Over the last decade the monitoring forms and methods at each site have become more detailed.

The recording forms used at Ashted Common between 1994 and 1996 were based on a basic format produced by English Nature in 1991. The completed forms on the 2237 living and dead *Quercus robur* pollards are held in ring binder files along with photographs of each tree. The forms recorded 16 tree characteristics (see box).

A re-survey at Ashted of the pollards is now planned employing the new recording technologies like GPS and digital cameras and using the more detailed National Ancient Tree Recording Forms referred to above.

In 1990, 547 *Fagus sylvatica* pollards at Burnham Beeches were surveyed and their condition recorded.

EPPING FOREST GPS SYSTEM

GPS system	Trimble Navigation Ltd.
GPS satellite signal receiver	Trimble Pro XR,
Data collector	TDC-1 Asset Surveyor.
(hand-held computer)	
Data processing	Pathfinder Office version 2.11.
GIS software	Mapinfo (currently version 5.5).

Data also stored on Microsoft Excel spreadsheets and Access database.

Datasheets were produced for all of the trees. Subsequent recording was carried out examining growth rates of the retained branches of cut trees (Read *et al.* 1996). As well as the girth and height of the trees, the condition of each was scored. Stem condition was scored from 1 - 10, canopy condition from 1 - 5 (eg amount of branches) and canopy quality was taken as a percentage score for the amount of branches with foliage on. In examining the growth responses of selected trees the distances between terminal bud scars were measured. This was carried out on branches in the north, east, south and west quadrants of each tree.

At Epping Forest recording began in 1995. A major survey of over 1500 veteran pollards that had been

RECORDING AT ASHTEAD IN 1990s

Species	No. dead and live limbs
Trunk diameter	in situ (> 15cms diameter)
Tree form (eg pollard)	Broken or cut stumps
Whole fallen	Visible heart rot
Remnant trunk	Epicormic growth
Remnant limbs	Lifting root plate
Standing dead tree	Physical damage
Stump > 4m or < 4m high	Fungal fruiting

FIG. 1



A trial area of Ashted Common, compartment 14, has been mapped and contains about 120 veteran oak pollards. The map shows that there is a distinct area devoid of pollards. From the air this is not noticeable because of the scrub and tree cover, nor was this well defined effect evident when the trees were surveyed.

pollarded since 1981 was undertaken to ascertain their location, state of re-growth, general health and the numbers of the different species. The recording forms were based on the same form design used by Ashtead but much simplified and modified to include data on re-growth (see box). The data collected were the minimum required for a basic inventory of the success of work carried out. The survey of 1500 trees was completed in 13 working days during December 1995 and January 1996. The results and conclusions were published in Dagley and Burman (1996).

The survey provided vital information and allowed some important conclusions to be drawn about the success of pollarding work on different species of tree (see 'Lessons Learnt' section below). However, it only recorded one aspect of the health of the pollards - that of the re-growth of new branches and their growth rate. It did not record the health of the bolting (or trunk) of the pollard. Monitoring of veteran trees should ensure that both components are recorded.

Towards more detailed monitoring. The national Ancient Tree Recording Form is not primarily concerned with monitoring. In Epping Forest, therefore, the form has been modified further to record extra details about both bark condition and the re-growing branches. The trees are each divided into four quadrants, basically north, east, south and west, for recording. For those veteran *Carpinus betulus* pol-

INVENTORY OF POLLARDS CUT AT EPPING FOREST

Species
Date pollarded
Alive/dead
Trunk diameter at 1.3m height
Tree form (eg pollard)
No. cut poles (> 15cm diameter)
No. cut poles (< 15cm diameter)
Regrowth: present or absent
Length of regrowth: in centimetres

STAGES OF MONITORING

Pre-cut

based on national recording form, additional detail includes:

- number & size of poles
- signs of previous cutting work
- presence of basal growth

Cutting operation records include:

- height of cuts
- no. of branches/poles retained
- any incidental damage sustained

Post-cut measures for each N, E, S & W quadrant :

- bark condition at different heights
- maximum re-growth length
- distribution of re-growing branches and epicormic activity

lards being pollarded, and the *Fagus sylvatica* and *Quercus robur* pollards having their crowns reduced, there are 3 stages of monitoring: pre-cut state, state after cutting operation and, finally, post-cut growth response.

At Epping Forest, this detailed growth response recording is planned for the first, second, third, fifth and seventh growing seasons following cutting. From 2002 all stages of the data-gathering exercise for each tree will be linked in an Access database.

At Burnham Beeches similar procedures are planned to record the 3 stages for the crown reduction work on the *Fagus sylvatica*. Following the cutting work records will be kept annually for the first two years and then every second year after this. The data gathered will include notes on growth including: presence of shoots from cut surfaces, growth from dormant buds, strength of growth from existing branches and amount of growth measured by distances between terminal bud scars. The data will be kept for all pollards whilst they are alive.

LESSONS LEARNT

Each site will have its own issues of historic and aesthetic interest, amenity, access and wildlife conservation to be addressed. Similarly, each tree needs to be considered individually in deciding on the final prescription.

Work on the trees. The trees are cut by chainsaw either from a hi-lift platform or by climbing into the tree. Most new pollards are created by using hand-held pole-saws. At Ashstead and Burnham either specialist contractors are employed, with staff working with them and carefully monitoring the work or staff carry out the work themselves. At Epping Forest there are three teams of staff with at least two trained tree-climbers each.

Burnham Beeches. Beech pollards.
(Photograph: Corporation of London).



THE IMPORTANCE OF INVENTORY WORK FOR THE CONSERVATION OF ANCIENT TREES

The value of basic, systematic inventory work to the conservation of ancient trees has been emphasised by Clayden (1996). Its importance is demonstrated perhaps no more dramatically than by the work carried out at Burnham Beeches over the last ten years. Following the 1990 survey (above) another complete survey was carried out between August 1999 and February 2000 (Read 2000b). During this latter survey tags were replaced as required, new photographs taken and other records of the tree condition were kept, some details of which are given above. Since 1990, 92 of these trees had died leaving 463 living pollards. The current rate of loss is 10 trees per year. This is a very rapid rate and all the ancient trees at the site could be dead by 2050. The cessation of pollarding 200 years ago means that the branches on the trees are very large and heavy and the trees are very unstable. This is the main reason for the high rate of loss, as the trees fall over or lose all their branches. This threatens the whole biological, cultural and amenity value of the Beeches (Read 2000b). It was only with the 1990 inventory data and subsequent follow-up that this serious situation was fully revealed and that the urgency of the situation was demonstrated. This information was fed into the work plan (see management objectives below) and the rate of work on the trees speeded up.

Crown reduction and clearance around over-stood pollards. The approach taken on the three sites for *Fagus sylvatica* and/or *Quercus robur* pollards is similar. More intervention is required with *Fagus sylvatica* pollards and crown reductions are being carried out (Read in press). Although some crown reductions are being carried out on *Quercus robur*, the imperative for this species, especially at Epping Forest, is to clear around the over-topped ancient pollards (Dagley & Burman 1996; Dagley in press).

Pollarding of ancient trees. *Carpinus betulus* pollards have been pollarded successfully, with over 1000 of such trees having been cut at Epping Forest over the last 20 years (Dagley in press). Recent monitoring elsewhere, however, has revealed concerns with bark health. As a result cutting methods have been modified and monitoring intensified. With the recent later autumns and earlier springs, coupled with drier summers, the period during which work can be carried out has been substantially reduced.

The lessons learnt and the increase in knowledge about the difficulties of conserving and protecting ancient trees is reflected fully in a recently-published book (Read 2000a).

MANAGEMENT RATIONALES AND OBJECTIVES

In the light of the lessons learnt so far, each site has developed detailed management plans for its ancient trees.

Burnham Beeches. Assessment of the success of intervention on *Fagus* veterans suggests it is having an impact and slowing the decline. The intervention is carefully limited to crown reductions of around

30% of the canopy for any one operation but can be more, depending on the tree. Since 1990, 199 of the *Fagus sylvatica* pollards have been cut. As a result of the 1999 - 2000 survey the Management Plan for the Beeches has set a target of 50 ancient *Fagus sylvatica* per year to be cut. The remaining 264 pollards, therefore, will be dealt with by the year 2006. The work will aim to reduce the weight of the limbs and ensure the clearing of undergrowth like holly scrub from around the trees (Read 2000b).

Ashtead Common. At Ashtead the *Quercus robur* pollards although top-heavy, are declining much more slowly in numbers and health. As a result the intervention planned is more limited. Minor crown reduction work is proposed only where necessary to prevent a tree splitting apart or losing a limb. The main thrust of the work is to clear the young naturally-regenerating trees from around the ancient trees so

RESCUE WORK ON VETERAN FAGUS & QUERCUS

Branch removal : long stubs to the cut branches and leaving plenty of growth on the tree after cutting. **Light levels :** both young and old *Fagus sylvatica* trees require more light when pollarded than an uncut maiden tree. **Exposure - sunlight :** sudden opening up around old *Quercus robur* can be detrimental in causing extreme drying out causing reduced vitality or death. Clearance needs to be carried out in stages removing concentric rings of surrounding vegetation. **Exposure - wind-throw :** clearing round the ancient trees several years prior to crown reduction work can be detrimental as the trees are made more susceptible to wind-throw. Need to clear in same year as work is being done on the ancient tree.

POLLARDING PRACTICE

Timing of pollarding/crown reduction: work is now carried out after 15th November and before 28th February. Some summer work is also done in June - July; spring and autumn months are avoided (see Lonsdale 1996). **Retaining limbs:** long stubs of up to 60cm have been recommended in the past for *Carpinus* pollards (Mitchell 1989) but shown smaller branches if present. Also basal growths (naturally-coppicing stems) on a pollard are left attached as this may help to provide sustenance for any re-growth at the top of the trunk. **Stub lengths:** long stubs of up to 60cm have been recommended in the past for *Carpinus* pollards (Mitchell 1989) but shown to be not significant for re-growth (Dagley & Burman 1996). However, recent work at Epping Forest follows a policy that there is no best length for stubs but a minimum of 90cm for large poles is desirable. Where practicable poles should be cut above their lowest lateral branches to ensure some live buds.

as to reduce the competition the latter face for light, space, and nutrients.

Epping Forest. *Carpinus betulus* pollards: 100 - 200 veteran pollards are being pollarded annually, with occasional years of reduced numbers (<50) to allow monitoring and review of the work. A pollarding cycle of 35 years is the planned outcome for the majority of the trees but this will be determined by the tree health monitoring in the next few years. Over 35 years it is proposed to pollard 5250 veteran *Carpinus betulus*, just over 25% of the total Forest population of these trees. Once pollarded, it is hoped that for a significant proportion of these 5250 trees the next pollarding event for each individual will be staged over a number of years before Year 35, each time removing only larger poles by hand-saw. Some veteran pollards cut in the 1940s have already been pollarded for a second time in 1999 and 2000.

Quercus and *Fagus*: three main areas of *Quercus robur* pollards are to be targeted for clearance of over-shading trees in the period 2001 - 2003. This will encompass around 300 - 500 veteran pollards. Crown reduction work is limited for these species to about 25 trees annually, but in the light of the results from Burnham Beeches the number of *Fagus* tackled may be increased at the Management Plan review in 2003.

New pollards at the three sites. Work on the veterans alone is not sufficient in the long-term to maintain the character of the three sites. As a result the creation of new pollards and encouraging open-grown trees are top priorities of the management plans. A wide range of trunk diameters is being experimented with for the new pollards, but branches are retained for all sizes and all species. This work has been successful and selected groups are being monitored. Some new pollards created 13 years ago at Burnham Beeches are now being cut for the second time ●

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