DISCOVERING ANCIENT WOODLANDS

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Some of our woodlands have been evolving since the end of the last glaciation, around 10,000 years ago. Admittedly this is a mere instant when set against the millions of years over which the tropical rainforest plant and animal communities have been evolving, but nevertheless woods represent one of our most important habitats for wildlife. However, these woods must be viewed against a long history of influence by man as, at least since the Mesolithic period, 7,000 years ago, clearance by felling, ring-barking, burning and grazing has bequeathed us one of the lowest proportions of woodland cover in Europe - about 7% of our land surface - and also a complex woodland structure that reflects the hand of man over the centuries.

The green ink on the Ordnance Survey 1:50,000 maps covers a multitude of woodland types - everything that could fairly be described as tree-covered. Indeed, it was for this reason that it was used as the basis for the 1981 Forestry Commission Census of Woodlands. All told, this green area amounts to 2,000,000 hectares (about 5,000,000 acres) in Great Britain, representing a vast variety of groves, coppices, woods, forests, belts, spinneys, coverts, parks and even scrub. However, only about one sixth of this or 340,000 hectares (about 850,000 acres) (Steele & Peterken 1982) represents ancient semi-natural woodland, a term used to refer to woods which originated before about 1600 or 1700 and were not planted.

This small area of woodland, about 1.25% of the British Isles, comprises a very high proportion of our richest wildlife habitats, offering the naturalist and field ecologist a wealth of interest.

In addition, these ancient woods of birches, Hazel, Alder, Aspen, oaks, limes, Field Maple, Beech, Hornbeam, Holly, Yew and elms, and in some Scottish woods Scots Pine are one of the richest historical records we possess, providing a fascinating challenge to the local historian.

Each one of our ancient woods has its own particular significance, and collectively they enable us to understand the complex relationships between soils, climate and vegetation. They also demonstrate the pervasive influence of man on nature over centuries. This article is about how to recognise those features of a wood, within its landscape context, which can provide clues to its age, as well as how to correlate field survey work with documentary evidence, and how to begin describing and classifying an ancient wood.

The concept of 'ancient' woods

It is important to realise that the term 'ancient' is an arbitrary, operational, definition. It refers to those woods where there is some good evidence, either from the wood itself or from map or documentary sources, that the wood existed in 1600 or 1700 (Kirby 1985). However, the quality of the evidence and the actual age of the woods vary a great deal, and it is seldom possible to prove as an absolute fact that a wood has been continuously present on a site for many centuries, even if it is 'known' by common sense deduction, from the Domesday Book, and from management records and other factors, that it must have been there long before the Conquest.

In reality, most woods which we can show, or very strongly suspect, to have been present in 1700 are likely to be a great deal older than 300 years. A few woods were enclosed in the 15th, 16th, or 17th Centuries on old fields, for example, Overhall Grove, Northants (Peterken 1981), but over much of England the great preponderance of ancient woodland dates from at least Saxon times and often long before that.

'Primary' and 'secondary' ancient woods

There is a substantial number of woods which have uninterrupted physical continuity with the 'Wildwood' of 7,000 years ago, even though they are not totally wild in the sense that they have been managed by man. These are referred to as 'primary' woods. The easiest ones to detect are those on steep cliffs or in wet places which could obviously never have been farmed - the Wye valley woods of Gwent and Gloucestershire, or the Borrowdale woods in Cumbria are clearly primary, but others can be found in areas of late forest such as the New Forest or the Kentish

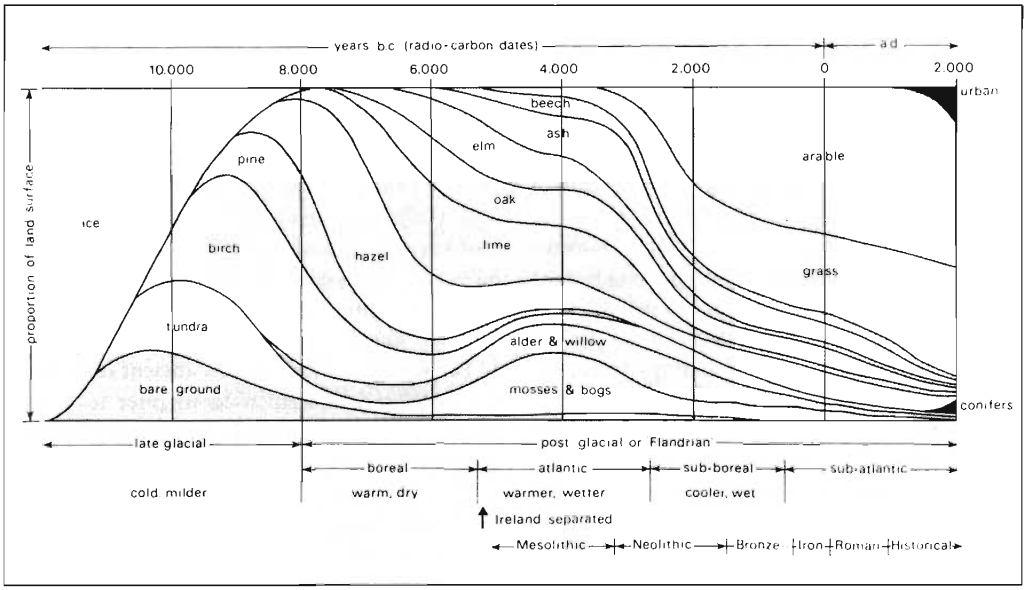

Diagram showing the gradual progression of changes from the bare ground after the last glaciation to the present day. The dates are based on radiocarbon dating and increasingly underestimate true dates as you go further back in time.

Weald. In these cases, important strands of evidence can often be obtained from the ancient undisturbed 'forest brown earth' soil profiles which distinguish them from similar woods which have developed on land cleared for farming in prehistoric times (Dimbleby & Gill 1955). The presence of relict species such as Wild Service Tree, *Sorbus torminalis*, and Midland Hawthorn, *Crataegus laevigata*, or suites of 'old forest' lichens (Rose 1976) or certain insects (Harding 1978) can also indicate a long period of continuity.

All woods which are not primary are 'secondary', but this term can cover woods which developed after a period of farming in the Bronze Age, in the Dark Ages, or on a Victorian railway embankment. Here, we are concerned only with those of pre-1700 origin. This date is convenient because it is before the great expansion of plantation forestry, and only 100 years before the first Ordnance Survey 1-inch maps, of which more below.

The origin of our woods

At the end of the last Ice Age, when the climate was becoming warmer, birches, Hazel and pine forest began to clothe the open tundra, and during the succeeding years the forest achieved its northerly limit, and slowly evolved into the 'Wildwood' of the Atlantic period. This was an immensely variable mosaic of communities of trees and shrubs, each closely adapted to the local climate, and the acidity, fertility and drainage of the vastly complicated soils of post- or peri-glacial Britain.

The trees themselves gradually turned the raw soils into mature forest brown earths, and the composition of the Wildwood slowly changed, as Beech, Field Maple and other species arrived.

Seven thousand years ago, Mesolithic man must have been overwhelmed by an ocean of trees, yet by 700 A.D. the Saxons were finding it necessary to pass laws to conserve an already threatened resource (Colebourn 1983). During this time, man had so altered the face of the British landscape that the basic pattern of today's woodlands was already laid down.

Clearance began in the Mesolithic period, probably at the upland margins of the forest. During the Neolithic and early Bronze Ages,

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Pinnick Wood in the New Forest. This is one of the most natural of the Forest's ancient woods; here oak still dominates as opposed to many others in the area which have been invaded by Beech.

when about a quarter of the Wildwood was destroyed, most farming was on lighter, more fertile soils in both uplands and lowlands. The pollen record from this time shows an increase of 'weed' species and a rapid decline of elm especially. By the end of the Bronze Age, more than half of the Wildwood had gone, and the process of clearance was still intensifying. During the Iron Age and Romano-British periods, farming was so widespread that in some chalkland areas there was much less woodland than there is today. The prehistoric clearances were partly balanced by some recolonization on fields which had been abandoned because they had become infertile, or the climate had deteriorated; for example much upland farmland became moor-

land, whilst lowland heaths developed on the acid gravels and sands of the south-east. In both situations, there were still pockets of woodland on difficult slopes, streamsides and so on, but these were under pressure from grazing, and may already have been hedged-off to allow regeneration. After the Roman withdrawal, there was certainly a considerable regrowth of woodland in the south; many ancient woods overlie Iron Age or Romano-British field banks (lynchets).

Thus the Saxon settlers inherited an England which was perhaps 30% woodland; some of the woods were small and already closely defined by banks or by changes in slope. On the heavy, difficult or infertile soils there were still some large forests, and there were many primary or prehistoric secondary woods within the areas of woodland recolonisation such as the uplands, the New Forest or the Chilterns.

During the ensuing 600 years, the Saxons succeeded in clearing about half of this remaining resource, as farmland once again became needed. The rate of clearance averaged over 12 hectares (30 acres) a day for six centuries!

The details of the distribution of today's woodlands are often determined by land management decisions from Saxon times. Saxon estates - many based on Iron Age or Roman land holdings - have led in their turn to the boundaries of parishes (Aston 1985). Even more significantly, the actual pattern of land enclosure was settling down in Saxon times. Thus we have the distinction between Rackham's 'ancient countryside', where there was piecemeal clearance by a scatter of individual farms of both hitherto untouched forest and of Bronze Age or later 'waste', producing a twisty organic landscape with many old woods and commons; and the 'planned countryside' of the Midlands, where nucleated villages, open fields with ridge and furrow, straight roads and few woods, predominated (Rackham 1986). In fact, it is more complex than this, as many parts of England are an intimate mixture of the two types. From the woodland point of view, 'ancient countryside' is often much more rewarding than 'planned countryside'.

Coppices and pasture woodlands

One particular feature of the legacy of Saxon England is that we can trace the establishment of two basic traditions of woodland management: coppicing and pasture woodland. These represent a fundamental distinction which underlies many of the physical and biological features of old woodlands as we see them today.

In medieval times, a wood was a source of fuel and materials for crafts and structural engineering. The regeneration of felled woods was of critical importance and grazing animals were therefore excluded from woods which were regularly cut over or coppiced, at least while the regrowth was young and accessible for browsing. Coppices are therefore distinguished by boundary woodbanks, and by the presence of coppice stools of native tree species.

Pasture woodlands are more complex, but were essentially woods open for much of the time to grazing stock. Since it is difficult to regenerate trees or coppice shoots in the presence of browsing cattle or deer, these woodlands were an awkward compromise between two functions, each of which was often promoted by a different party. Deer parks, wooded commons grazed by commoners' stock, royal forests and chases are all examples of pasture woodlands.

Indeed, the core of many royal forests from Norman times was the unenclosed manorial 'wastes' within the area subject to forest law. Here, whilst the king owned the hunting rights to the beasts of the forest (principally deer and boar), the majority of the animals were stock belonging to the commoners of the manor. The soil and timber belonged to the king only if he owned the manor, but even on land owned by others the landowner required a royal licence either to fell the timber or to enclose land, for example (see Young 1979), to make his own deer park or for fields.

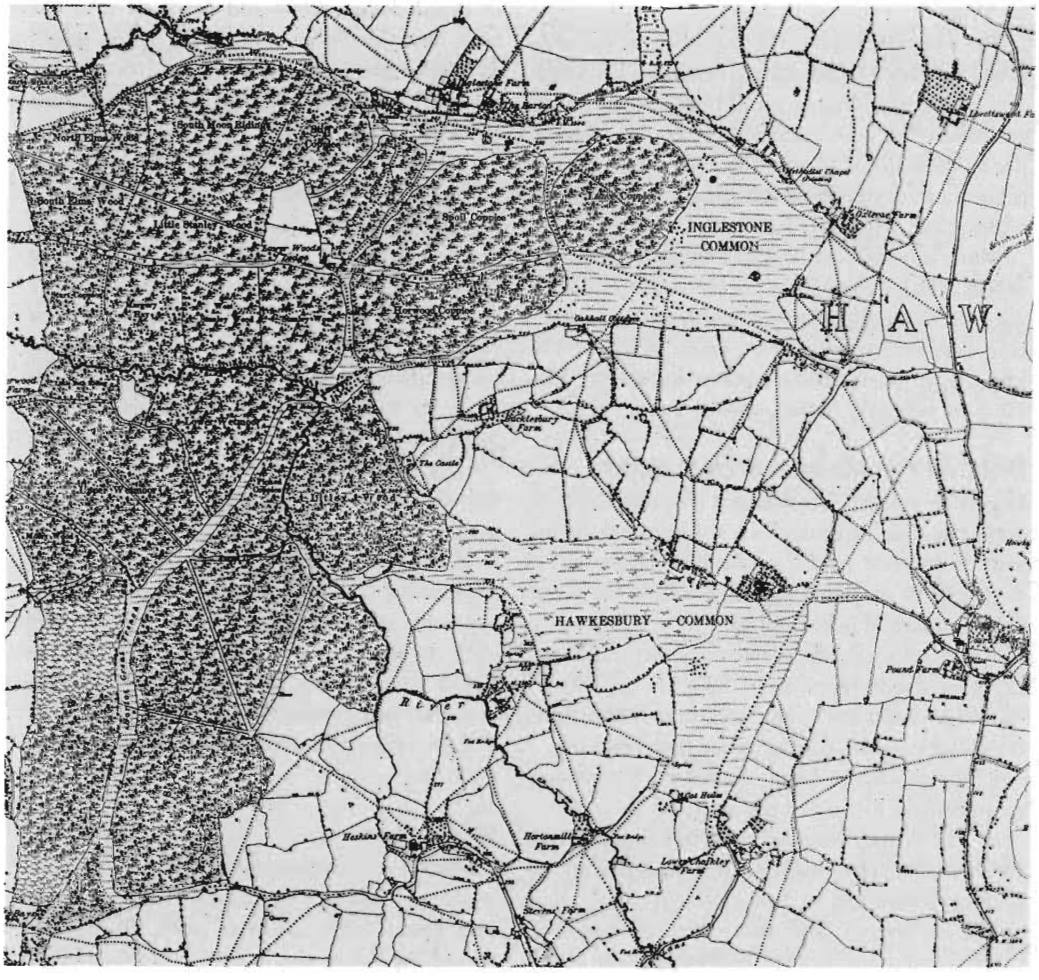
Some forests were uncompartmented and grazed as a whole, while others were divided into a fixed pattern of coppices and 'launds', so that newly cut areas of coppice could be protected from stock for a few years before being opened again for grazing. Hatfield Broadoak Forest in Essex is a superb example of a compartmented forest (Rackham 1989); there are also some compartmented wood-commons, such as Inglestone and Hawksbury in Gloucestershire (see map).

The two contrasting traditions of coppicing without grazing, and grazing often with only

very occasional regeneration, have been pursued for centuries, and produced two very different wildlife habitats.

Coppicing repeatedly opens a wood up to light, but leaves the ground flora undisturbed; and, because cutting the trees prolongs their life and there is no need to plant new ones, it also keeps change in woodland composition to a minimum. Therefore, the actual distribution of tree species such as Ash, Small-leaved Lime, Hazel and Field Maple within a wood today may have originated thousands of years ago. These sunny, flower-rich coppices are superb habitats for insects and birds.

On the other hand, pasture woods have a relatively suppressed (though sometimes species-rich) ground flora, which may contain meadow or acid grassland plants, and because the trees are not usually felled the woods have a constant high humidity and may therefore be rich in lichens and bryophytes. Their tree and shrub composition is likely to have been altered to favour



This 1st Edition Ordnance Survey map from the late 19th Century shows the pattern of enclosed rounded coppices and unenclosed commonland. This rich mixture of open and enclosed land was typical of the Cotswolds.

grazing-tolerant species such as Holly or those whose seedlings can grow in shade.

Scotland's Ancient Woodlands

The ancient woods of Scotland have a rather different character. Being more northerly, the climate is more Arctic in the north-east, but the west coast is warm, damp and 'Atlantic'. Scotland, however, never acquired many of the 'late-comer' trees of the English wildwoods – Beech, Field Maple, or Hornbeam. South-west Scotland lies in the Oak-Hazel province (Rackham 1986) and has superb coastal oakwoods dripping with lichens. In them, there are streaks of Ash-Wych elm woods in base-rich gullies, and there are famous Ash woods at Rassal, and Hazel woods on Skye.

The Highlands offer relics of the old Caledonian Pine-Birch forest, for example in Glen Affric and on Deeside, but much of the forest has long succumbed to natural development of blanket peat – Rannoch Moor, for example – or to man-made destruction which was particularly widespread after the 17th Century.

Many woods were once coppiced to fuel ironworks, but have since been neglected and allowed to be grazed or browsed, so the distinction between coppice and pasture woodland is blurred. Even so, many ancient woods in Scotland are superbly rich in flowers and insects.

Discovering your local ancient wood

How can you tell whether the wood where you walk the dog, birdwatch or study plants or insects is ancient? And if it is ancient, how was it managed in medieval times? Broadly, there are three sources of information:

1. written evidence, which may include maps, charters, deeds, rents, etc.,

2. the wood itself, its structure, shape, soil, composition, flowers and other features, and

3. the landscape context, the enclosure and management history of the area.

In this article, we are concerned mainly with the first two, but you will soon find that every area of Britain has its own distinctive pattern of enclosure history, and that once you begin to understand it you will feel more confident about making judgements as to the likely age of a wood.

Documents

The oldest verbal or written evidence for woodland age may well be place names mentioned in the Anglo-Saxon land charters, many of which describe the boundaries of particular land parcels (usually large estates) in some detail. It is worth a trip to your County Record Office or library to find out whether there are any charters with bounds. Charters, many of which use wood-edges or trees as boundary markers, and can often be related in part to present-day parish boundaries. Even if a charter does not mention woodland, it may help you understand the land-use history by mentioning hedges, ponds or even the headlands or furlongs of open-field.

Record Offices usually contain large numbers of dated documents – old deeds of sale, wills, rents and leases and so on – which refer to particular areas of land by name and can therefore provide fascinating evidence as to the history of a wood. These are frequently indexed by parish, so it may not be too arduous to extract at least some of them which relate to a particular wood.

The application of Forest Law to large areas of England by the 13th Century, and the need for royal licence to 'empark' or fell woodland means that the Public Record Office is rich in references to woodlands and parks. Many of the various Rolls, in Latin, have been transcribed and are available in Record Office reference rooms. Others have not, and there is still a rich store of knowledge to be extracted from them. The same is true of the estate records of many of the great landowners - perhaps most of all the Church and the Oxford and Cambridge Colleges, whose land holdings are widespread. Woods with names such as Priors, Abbots, Bishops, Priests, etc. Copse or Wood are almost invariably very old and may have their coppice history recorded. The records of many abbeys are exceptionally good.

Maps

Maps are an exceptionally important source for woodland history because they show shape, size and often other features such as adjoining ownerships and land-uses, parish boundaries, and so on. Even so, like written documents, they sometimes need careful interpretation.

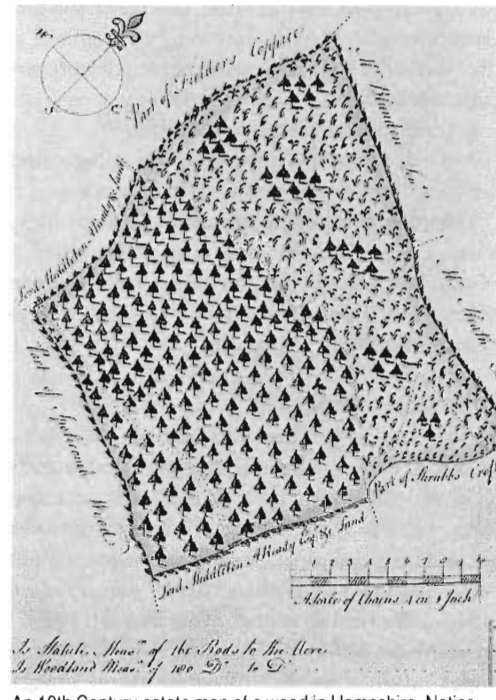
The most widespread early maps are the various editions of the first Ordnance Survey 1-inch to 1-mile maps (and their 2-inch or 3-inch to 1-mile 'Mudge' predecessors in the cases of Kent, South Hampshire and the Isle of Wight). The different printings of these early 1-inch sheets vary considerably. Currently, the most accessible for England and Wales is the David and Charles series, but these are a very late and extremely composite version, and are therefore not always reliable. Early-state 1-inch sheets are available in some Record Offices, and in volume form from Harry Margary (Lympne Castle, Kent). One limitation on the usefulness of these maps is that small, or recently coppiced woods were often omitted, especially if they were away from roads.

Earlier maps are well worth seeking out, such as the various proprietary maps, often of a county, produced by Taylor, Rocque, Chapman and Andre and, rather later, Greenwood. Some of these are also extremely useful, pre-dating final enclosure in the 19th Century. For actual land-use, the various Enclosure Award maps and accompanying schedules are often helpful, as are the Tithe Commutation Surveys of around 1840.

From about 1858 to 1876, the superb first editions of the 6-inches to 1-mile Ordnance Survey maps were prepared. These are marvellous, beautiful documents which reveal the English landscape in its gorgeous detail; hedgerows, trees, ponds, meadows, parish tithings and even the final state of the old Saxon 'hundred' boundaries, acreages and other indispensable information are all recorded. Perhaps most usefully of all, the vegetation and administrative detail and texture give a vivid impression of the enclosure patterns and the extent of surviving waste in the 'ancient countryside' areas. These maps, though only 120 years old, are an absolute *sine qua non* for woodland and landscape research.

Maps are especially good at demonstrating which woods were pasture woodlands, since such sites will usually show either straggling boundaries with corner funnels, or a pattern of compartmentalisation. The 1870 6-inch maps are available in Record Offices, in bound volumes in the Bodleian Library in Oxford, and in the Reference Map Library at the Ordnance Survey in Southampton.

The various estate surveys are another class of



An 18th Century estate map of a wood in Hampshire. Notice how the different ages of the trees are shown. Maps, such as this, can be an invaluable source of information.

map, some of which may even be older. Surveys of individual estates or manors, or sometimes whole villages, as well as catalogues of individual woods, exist in many Record Offices, but a remarkably large number are still tucked away in estate archives or even hanging on estate office walls! Many of these old coloured maps are rather faded, but others are astonishingly fresh and brilliant. All are venerable objects in their own right. Such estate maps were a rarity before about 1600, but there are many 17th and 18th Century examples. Those that are relevant to royal estates, such as Norden's bound volume on Windsor Forest, are likely to be found in the Public Record Office in London.

One final note of caution: when working with old documents or maps, it is always advisable to remember that private maps were usually drawn up to make a specific point - unless you know the purpose of the map you will not know which aspect to mistrust!

Evidence from the wood

There are four main aspects of a wood of which

you should take special note. The three 'visible' aspects are:

1. boundaries and banks and other topographical features,
2. the structure of the woods, and
3. the composition - trees, shrubs and ground flora.

The fourth aspect is the soils and geology, which can explain many strange features of a woodland, including, in many cases, the reason why a particular area was singled out to be kept as a woodland.

Boundaries and banks

Earthworks within a wood, such as old banks, tracks, ditches, lynchets, iron-woodland archaeological features, or even earth castles and barrows, can reveal an enormous amount about the history of a wood, including the use of a site before secondary woodland development.

The edges of a wood are often of special significance because, unless defined by steep slopes or cliffs, as they often are in the craggy north-west of England, Wales and the Highlands, they reflect the land-use decisions at the time when they were made. They are often marked by a bank – a 'woodbank' – which would originally have had a live or dead hedge to help exclude animals.

Woodbanks deserve a great deal of attention. The legal boundary of the wood is usually the ditch outside the wood, the material from which went to make the bank that was cast up on the wood side. The cross-section of the bank of an old wood is therefore asymmetrical; steep on the ditch side, running out gradually to the original ground level on the inside. Such banks are often better drained, more silty and more nutrient-rich than the woodland soil and will almost invariably support different plants – including trees – from the main body of the wood. In general, the oldest woodbanks are often the broadest. Medieval banks are rarely straight, as the ditch-digger straggled from landmark to landmark, avoiding large trees or rocks. Occasionally ancient ponds were incorporated into the boundary as natural barriers; there is a beautiful example of this at the Bradfield Woods in Suffolk. Ponds are a prominent feature of many East Anglian woods on drift soils, and are not infrequent in Midlands clay woods. Many of them are of natural origin and are extremely ancient.

Post-medieval woods often have much narrower, more upright banks; the most extreme are the vertical-sided 19th Century banks created when old commons or forests (i.e. pasture woods) were wholly or partially enclosed.

One of the main reasons for the continuity of old banks is that they were very hard work to build, and once created were seldom destroyed. This is especially the case with many of the oldest banks which may also have marked the bounds of Saxon, or earlier, estates, and subsequently became fossilised as the boundaries of parishes at any time between about 800 and 1300 A.D. A wood whose bank defines part of a parish, manor or tithing is almost bound to be ancient.

Quite often, an ancient wood has a number of old banks running parallel along at least one side. This usually means that either the wood has grown outwards in a period of farm decline, and then been re-defined, or that the wood had colonised an old trackway. Such situations are useful in studying the colonizing behaviour of woodland plants. In a case like this, the oldest bank is usually the broadest, not the tallest. Conversely, many ancient woods have been partly grubbed-out, and a smaller younger bank then marks the new cut-back edge.

Even when a wood has been completely cleared, it is often possible to trace all or part of its extent where the ancient woodbank has survived either along an adjoining lane or as a hedge. Field names can be helpful here: fields named Riddings, Stubbs, Grublands, Stocks and names referring to stumps often turn out to have once been part of a wood. Occasionally, you can even find Grub or Riddings Copse and this may indicate a wood that has recolonized within its original boundary after an interlude of clearance.

There are many other physical features which can show that a site has not always been woodland. Barrows, medieval cultivation marks such as ridge-and-furrow, or the 'adulterine' earthwork castles of the 14th Century all give some kind of maximum age for a wood.

On the chalklands, many Dark Age secondary woods - about 1,500 years old - overlie regular patterns of Iron Age or Romano-British square fields, and the soils in these woods can also

reinforce the evidence; revealed by a mosaic of Dog's Mercury, *Mercurialis perennis*, where the chalk has been brought to the surface, and Bluebells, *Hyacinthoides non-scriptus*, on acid clay-with-flints, where it has not.

Similarly, even very old woods may conceal Roman villas or other structures such as deserted medieval hamlets or long-forgotten trackways.

Looking at ancient woodland structure

Woodland structure is a much less familiar concept, except to foresters and woodland ecologists, than woodland composition. The structure of a wood can include the density of stems at various places in a section of the wood; the manner in which individual trees are growing, for example, whether they are saplings, coppice, standards, or pollards; the age structure of the section of wood, as well as the age of the actual coppice growth; and the relative degree of development of the canopy and the lower layers, including the sub-canopy and shrub layer.

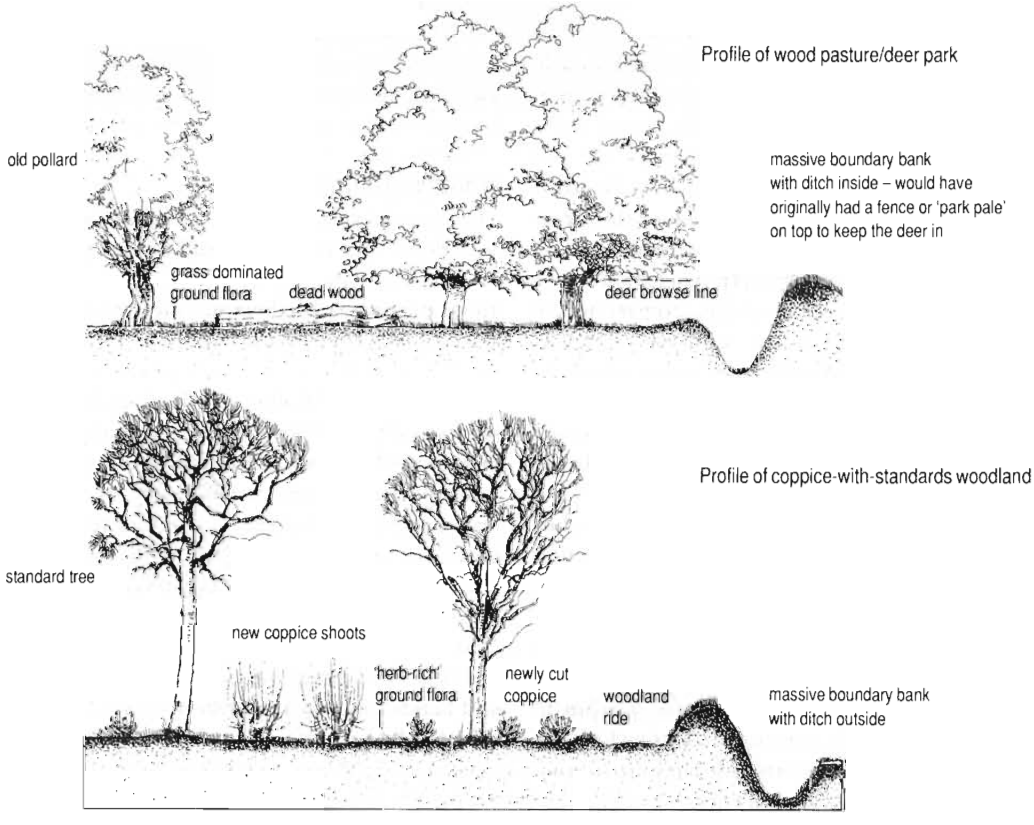
The structure of a wood is strongly related to its management history, in particular whether trees have been coppiced or pollarded, or all allowed to grow on as maiden stems. Ancient woods have often been managed in one way for centuries (at least until this century!) and their structure may therefore be extremely distinctive.

The most obvious distinctions are between:

1. Simple coppice: woodland where multiple-stemmed regrowth from cut 'stools' dominates the wood. This usually, but not always, consists of several species - Ash, Field Maple and Hazel, for instance - and is not overtopped by canopy trees. Often with a herb-rich ground flora.

2. Coppice-with-standards: woodland which was predominantly coppiced but where there are standards (trees allowed to grow on towards maturity for their timber) either planted or 'singled' from coppice stools, but not forming a closed canopy.

3. High forest: woodland where there is a more or less complete canopy and the shrub layer is



suppressed or absent. Semi-natural high forest will usually have several tree species, but not all in the canopy. In high forest managed as pasture woodland there are often pollards (trees cut regularly at head height out of reach of browsing livestock), grazing-resistant herbs such as Holly, and a grassy rather than herb-rich floor.

These all contrast markedly with semi-natural woods of recent origin, where there is a high density of saplings or young trees, often of only one or two species, and if there has been coppicing the stools are small (just the diameter of a young tree's stump) and will probably have been cut only once. Modern hardwood plantations will generally consist of even-aged trees, planted close together in order to promote strong upward growth. There will be few, if any, understorey trees. The vegetation of the wide rides may indicate the original natural cover of the woods.

Fundamentally, the difference between woods which are coppices, with or without standards, and those which are ancient high forests is that coppices have been enclosed against grazing - some of them almost certainly for more than 1,000 years. You have only to consider the difference between the light open airiness of a newly cut coppice, bright with spring Primroses, *Primula vulgaris,* orchids, Bluebells and butterflies, and the cavernous gloom of the humid Oak and Beech high forest of the New Forest or Windsor to appreciate the dramatic effect which this structural contrast has on woodland wildlife.

At Hatfield Broadoak, it is possible to see both types of structure because in this compartmented pasture woodland one can stand on a coppice-bank and see on one side giant, ancient stools of Hornbeam or Field Maple, 2.5 metres or more across, surrounded by carpets of Primroses, and on the other side open grassy plains dotted with pollarded Hornbeams.

One structural feature to be aware of when looking at a local copse or wooded common, is the size, and therefore age, of any coppice stools it may have. A 400-year-old Ash stool will be around 2 metres in diameter, but many coppice stools, especially of Ash and Small-leaved Lime, can be much older and larger. I have seen Small-leaved Lime stools 6 metres across, which are probably over 1,000 years old. They are so completely hollow in the middle that they look like groups of trees.

It is not difficult to tell when a whole wood has been planted; the trees are often (though not always) regularly spaced, sometimes even in neat rows, and they are usually of the same age. But beware, because in many woods which have a coppice-with-standards management history the standards were planted in the 19th Century. Also, be suspicious of even-aged high forest with a suppressed coppice layer which includes old stools and has a rich flora, and of the woodland owner who insists that the wood cannot be ancient because the trees (i.e. the timber) 'were planted in 1826', as very many ancient mixed coppices are now dominated by stands of 19th Century oak, often alien to the site.

On the other hand, a large number of ancient pasture woods, especially the wooded commons and forest-relic 'greens' of the ancient countryside, have now succeeded to secondary birch and sallow woodland which consists predominantly of young and even-aged trees. Nevertheless, the complement of woodland flowers and insects of these old, unploughed sites can be very high, indeed, reminding us that 'ancient woodland' is not necessarily, from a biological point of view, a tract of ancient trees, but a wood which has not been ploughed up for many centuries.

Woodland composition

The trees and shrubs, and the plants of the woodland floor, even the lichens and mosses growing on the trees, can indicate an enormous amount about the history of a wood, as can its soils and geology, and the climatic region within which it lies.

In the original Wildwood, the distribution of plants and trees was sorted out naturally by the processes of competition and the preferences of individual species for certain conditions of drainage, nutrient supply, base-richness, shade and so on. Thus Alderwoods came to occupy many strongly flushed or alluvial sites, Wych Elm colonized moist nutrient-rich places, and Ash, Field Maple and Small-leaved Lime rather more neutral situations, whilst species such as Sessile Oak and Beech could succeed where others failed on acid, leached gravels.

Hence, the Wildwood was not a mixed forest 'trying to turn into oakwood'; it was a very

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Staverton Park , near Woodbridge in Suffolk, is a magnificent example of a medieval deer park dating from the 13th Century. The photograph shows some of the thousands of ancient oak pollards that can still be found there. This park also contains some of the largest hollies and rowans in Britain.

complex forest, where locally the tree communities were closely adapted to soils and climate, producing a mosaic of Alderwoods, Ash-Hazel-Maple woods, oak-birch-Hazel woods with various stands of Small-leaved Limes, elm-woods, and so on. What is remarkable is that these same variations still persist today in our ancient woodlands, though in many cases they have been masked by later planting. It should also be remembered that the overall natural composition of ancient woodlands has changed over several thousand years as a result of climatic change, which has, for example, favoured Hornbeam and Beech over Small-leaved Lime. This ancient, natural variation in composition is most widely visible in coppiced woods, as coppicing prolongs the life of individual trees and avoids the need for planting (except, as a forester will tell you, if you wish to grow high-quality timber as opposed to wood).

The majority of native trees regenerate well after coppice-cutting, and others, such as Aspen and Wild Service Tree, regenerate mainly by suckering from the root system. Since the individual trees survive, so does their pattern of distribution within a wood, and there are plenty of documentary references - even the names of woods - which show that the composition of many ancient woods has stayed fairly constant for more than 1,000 years.

Within a wood, these ancient, semi-natural (i.e. not planted) communities of trees are referred to as 'stands'. Analysis of these can be useful as they can help to clarify what is happening throughout an individual wood and to show how woods vary across Britain.

One method of analysis, and much the most useful in terms of woodland-management history and looking at woodland in relation to soil

	ASSOCIATING TREES							NON ASSOCIATING TREES				
GROUP NO.	birches	oaks	Ash	Field Maple	limes	Wych Elm	Alder	Beech	Hornbeam	English Elm	Scots Pine	COMMON NAME OF GROUP
11	●	●	●	●	●	●	○	○	○	○	Scots Pine	Pinewoods
10	●	●	●	●	●	●	○	○	○	English Elm		English Elm Stands
9	●	●	●	●	●	●	○	○	Hornbeam			Hornbeam Woods
8	●	●	●	●	●	●	○	Beech				Beechwoods
7	●	●	●	●	●	●	Alder					Alderwoods
1	●	●	●	●	●	Wych Elm						Ash/Wych Elm Woods
4or5	●	●	●	●	Small-leaved Lime							Lime Woods
2	●	●	●	Field Maple								Ash/Maple Woods
3	●	●	Ash									Ash/Hazel Woods
6	●	oaks										Oak/Birch Woods
12	birches											Birch (Rowan) Woods

● may be present or absent ○ usually absent

Chart summarizing the main woodland stand groups (see text below for explanation)

acidity and fertility, is the Peterken Stand-type Classification, developed by George Peterken, chief woodland scientist at the Nature Conservancy Council (Peterken 1981). This system is based on the composition of the coppice layer, except in stands with an obvious and long history of pasture-woodland management. This avoids the old trap of wrongly classifying woods apparently dominated by 19th Century planted Oak or Beech. It divides British woodlands into more than 40 different stand types, but these fall into just 12 main stand groups. After a little practice (preferably working with someone who knows the system well) it is not too hard to master.

When making notes on a wood, you should:

1. Be aware that large woods usually contain more than one semi-natural stand type. An increase in elms or Field Maple, or change from birches to Hazel, is likely to be significant.

2. Be clear that a stand is an area of reasonable homogeneity, but this could include a consistent strong scatter of a species - such as Wych Elm.

3. Make separate notes and tree species lists for each obviously different part of the wood.

4. If possible, complete a record card (available from your local NCC office).

First, make a list of all the trees present in each stand. Then look at the chart shown in the table above to see which of the trees occurs in each of the 12 main stand groups. The key is the row of trees running from top right to bottom left. Whichever of the trees on your list (present as coppice or other long-established trees such as pollards) is highest on this scale defines the group. Thus, if your stand contains Ash, Field Maple and Hazel it is an Ash-Maple stand, Group 2. The same stand but with a significant proportion of Beech would be a Beech stand, Group 8.

From the stand groups, the stand types and then the stand sub-types can be determined, usually by reference to the soils and the presence of subsidiary trees or shrubs. Thus our Beech stand might be classified as:

Stand Group 8 *Beechwoods*

Stand Type 8C *Calcareous Pedunculate Oak-Ash-Beechwoods*

Stand Sub-type 8Cc *Maple variant*

For these details you will need to read Dr Peterken's book, or use a key which is available from the NCC at Peterborough (Peterken 1980).

One very important point about this classification is that it is based on the most significant tree species present, not the most abundant, so you need to keep a sharp lookout for species such as Field Maple, Wych Elm, Elder or Hornbeam amongst the Hazel, birches and sallows. You can ignore species which are present only as a single tree or two.

The second kind of classification is a variant

of the 'plot-type', in which essentially you take a large quadrat and record everything from the canopy to the mosses growing on the ground (Bunce & Shaw 1973). This is more demanding of effort and expertise, yet it tends to lump many very different woodlands into few categories. If you want to understand ancient woodlands in terms of species composition related to soils and management, the Peterken classification is more sensitive than the plot-type, which has, however, been used to derive the National Vegetation Classification (NCC, to be published shortly).

The second aspect of composition which is very helpful in determining whether a wood may be ancient and semi-natural involves looking at the ground flora. Many of the plants which grow in woodlands can spread only slowly from one wood to another, so they can be good indicators of ancient woodlands.

Both Peterken and Oliver Rackham have investigated the hypothesis of ancient woodland flowers. Rackham studied Oxlips, *Primula elatior,* spreading very slowly from ancient onto adjoining, recent, secondary woodland at Hayley Wood in Cambridgeshire (Rackham 1975). Peterken found that in Lincolnshire many species, including Pale Sedge, *Carex pallescens*, Smooth-stalked Sedge, *Carex laevigata,* Toothwort, *Lathraea squamaria,* Bitter Vetch, *Lathyrus montanus*, Woodruff, *Galium odoratum,* Greater Woodrush, *Luzula sylvatica,* and Common Cow-wheat, *Melampyrum pratense* were strictly confined to ancient woodlands, whilst others had a strong association with ancient woods, but were not absolutely confined to them (Peterken 1974). These include Primrose, Wood Anemone, *Anemone nemorosa,* Wood Sorrel, *Oxalis acetosa*, and Early Purple Orchid, *Orchis mascula.*

In practice, many flowers are much commoner in ancient woods, but occasionally turn up in recent woods. But there are two elements in determining whether a species is a good indicator of ancient woodland or not. One is the distribution of the species in different habitats, and the other is the evidence for the age of the woods where it does or does not occur. Therefore, to appreciate the problem, you have to understand both the biological evidence and the map and

A coppiced Ash stool in Felshamhall Wood, Suffolk. This stool is probably over 400 years old. Despite their great age they still produce a healthy crop of poles.

Bob Gibbons

documentary evidence. Approximately 250 species of flowers, sedges and grasses are found mainly in woods, but their reasons for being there differ enormously. A few actually require trees – for example, Toothwort, which is parasitic on the roots of certain trees such as Field Maple and Hazel – or leaf litter, for example, the Bird's-nest Orchid, *Neottia nidus-avis*. Others may not be able to withstand grazing pressure or ploughing, for example Water Avens, *Geum rivale,* Pignut, *Conopodium majus,* or Greater Woodrush, which can all be found outside woods if grazing is not too heavy, and can be typical of meadows. Bluebell and Early Purple Orchid are examples of species that are intolerant of ploughing; the latter can be found just as commonly in hay meadows, or on chalk or limestone grasslands.

On the other hand, some woodland plants are found in woods because they dislike competition and are able to tolerate shade: Sanicle, *Sanicula europaea,* and Wood Spurge, *Euphorbia amygdaloides*, are good examples. Because of these additional factors, and the interactions between them, some flowers behave differently in different parts of the country. Lily-of-the-valley, *Convallaria majalis*, is a calcicole (lime-seeker) in the north, but a calcifuge in the south.

Another problem is that many people make insecure statements about woodland history. It is a great mistake to say that if a woodland plant occurs in two woods, neither of which is shown on the 1810 Ordnance Survey 1-inch map, this proves that the species can live in recent secondary woodland. The woods may well have been missed off the map! Equally, many species, including Bluebell, Wood Sorrel, Yellow Pimpernel, *Lysimachia nemorum*, Pale Sedge, Bitter Vetch, Narrow-leaved Lungwort, *Pulmonaria longifolia,* and Lesser Butterfly Orchid, *Platanthera chlorantha*, can survive for centuries in the open in old commons – even if trees are few or absent. When, after 100 years without grazing, such a common, which may perhaps have been mapped as grassland with scattered trees in 1870, becomes recent 'secondary' woodland, is that woodland ancient or not? One could well argue that, as an unploughed, unherbicided, species-rich community it should be treated as such, but your view of whether, for example, Pale Sedge is a 'good indicator' will depend upon your answer to the question! It should also be borne in mind that because of climatic factors some 'indicator species' are more reliable in some parts

Pollarded Hornbeams in Epping Forest, the largest remaining tract of the Royal Forest of Essex.

Phil Colebourn

of the country than others. For instance, Dog's Mercury is a good indicator in the east but can invade recent secondary woodland in the south-west.

There is, however, good evidence that ground-flora communities – since herbs interact just as trees do – are very ancient indeed (Rackham 1975), and have become adapted to a consistent pattern of conditions. Therefore, on balance, the safest course of action is often to count how many 'indicator' plants are present. This has been done for many hundreds of ancient woods across Britain, although the precise list of indicator species varies from region to region. If you would like to do some recording, speak to your local Wildlife Trust, NCC office or County Council and see if you can obtain some blank record cards. These will usually have one side for the structure of the wood, and one for 'indicator species'.

Conclusion

The techniques for identifying and describing ancient woodlands are many and various, and full of pitfalls for the unwary. There is, however, no substitute for experience, so the sooner you start...!

One thing is certain: there is a desperate need for more research on individual woods and on woodland in general. Many thousands of woods across Britain have never been surveyed, so you never know quite what you might add to the sum of knowledge.

There has been much debate recently about the validity of the very concept of 'ancient woodland'. Paradoxically, the debate has arisen because, after years of unfettered destruction of our old woods for development or forestry, official policies have at last begun to recognize the need to conserve what remains. Circulars from the Department of the Environment now urge planning authorities to protect the remaining ancient woods (DoE 27/87), whilst the Forestry Commission's current policies for the commercial management of woods defined as 'ancient' are beginning to be both firmer and more sensitive. The definition of 'ancient', which underlies the Inventories of ancient woodland being prepared county by county by the NCC (Kirby 1984) has therefore acquired a greater economic and social significance, and not surprisingly attracted criticism from those who wish to destroy the composition, structure or extent of ancient woodlands for financial gain. The only answer to such vandalism is more thorough surveys and more research so that the conservation bodies are armed with sufficient weight of evidence to secure important sites. Increasingly in recent years, bodies such as the Woodland Trust, the RSPB and the county wildlife trusts have been acquiring some of our most important woodlands.

References

Aston, M 1985 *Interpreting the Landscape.* Batsford, London

Beevor, H 1925 Norfolk Woodlands. *Quart J. For.* 19

Bunce, R G H, & Shaw, M W 1973 A Standardised Procedure for Ecological Survey. *Journ. Env. Management* 1

Colebourn, P H 1983 *Ancient Woodland.* Hampshire County Council

Colebourn, P H, & Gibbons, R B 1987 *Britain's Natural Heritage.* Blandford/Cassell, London

Department of the Environment 1987 *Nature Conservation.* Circular DoE 27/87, HMSO, Lonson

Dimbleby, G W, & Gill, J M 1955 The occurrence of Podzols under deciduous woodland in the New Forest. *Forestry* 28

Harding, P 1978 *The Invertebrate Fauna of the Mature Timber Habitat.* Unpub. NCC, Peterborough

Kirby, K J 1985 *A Woodland Survey Handbook Draft.* Unpub. NCC, Peterborough

Kirby, K J, et al 1984 Inventories of ancient semi-natural woodland. *Focus on Conservation No 6.* NCC, Peterborough

Peterken, G F 1974 A method for assessing woodland flora for conservation using indicator species. *Biol. Conserv.* 6: 239-45

Peterken, G F 1980 Classification of Stand Types in Semi-natural Woodland. CST Notes No 23. Unpub.NCC, Peterborough

Peterken, G F 1981 *Woodland Conservation and Management.* Chapman and Hall, London

Rackham, O 1975 *Hayley Wood.* Cambs. & Isle of Ely Naturalists' Trust, Cambridge

Rackham, O 1980 *Ancient Woodland.* Arnold, London

Rackham, O 1986 *The History of the Coutryside.* Dent, London

Rackham, O 1989 *The Lost Forest. The Story of Hatfield Forest.* Dent, London

Rose, F 1976 Lichenological indicators of age and environmental continuity in woodlands. In: *Lichenology; Progress and Problems,* ed. Braun, Hawksworth, Bailey. Academic Press, London

Steele, R C, and Peterken, G F 1982 Management Objectives for Broadleaved Woodland and Conservation. In: *Broadleaves in Britain.* Inst. Chart. Foresters

Woodell, S R J 1983 *The English Landscape, Past, Present and Future.* Oxford (contains articles by Rackham, Cunliff, Beresford *et al*)

Young, C R 1979 *The Royal Forests of Medieval England.* Leicester

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