Woodlands of the Lower Wye
Origins, History and Management

Internet Version. Free hard copy available from AONB office, Monmouth. 01600 713977
The two faces of Wye Valley woodlands: dense woodlands at Symonds Yat contrasted with scattered woodland around Capler Camp
INTRODUCTION

WOODLAND CHARACTERISTICS
How much woodland
Ancient woodland
Ownership
Types of semi-natural woodland
Designations

ORIGINS AND PAST MANAGEMENT
Outline of woodland history in the lower Wye Valley
Wood pastures
Coppices
Broadleaved high forest
Conifer plantations
Recent restorations
Secondary woodland
Woodland composition
Farmland trees

WOODLAND ARCHAEOLOGY
Ancient earthworks
Industrial relicts
Tracks in woods
Farming remains in woods
Earthworks of traditional woodland use and management
Recreation
Earthworks and natural features as information about woodland history

NATURAL FEATURES
Mixed deciduous woodland
Other habitats
Geological and geomorphological features

FLORA AND FAUNA
Habitats
Ground vegetation and common plants
Woodland plants
Bryophytes, lichens and fungi
Woodland fauna
Special protection for species

TRENDS AND THREATS
Deer
Grey squirrels
Wild boar
Chemicals
Climate change

MANAGEMENT OPPORTUNITIES AND OPTIONS
General policy
Sustainability
Key features of woodland management
Specialised aspects
New woodland
Trees outside woodland
Conclusion

NOTES, REFERENCES AND FURTHER READING

ACKNOWLEDGEMENTS AND WOODLAND MANAGEMENT

REFERENCE MAP

Compiled by George Peterken • Design by Tony Eggar • © Wye Valley AONB 2007
Published by The Wye Valley AONB Unit on behalf of the Ravine WoodLIFE Project
For well over two centuries, visitors to the Lower Wye Valley have been struck by the amount and diversity of the woodlands. From Goodrich south to Chepstow, both banks of the gorge are covered in mature mixtures of oak, beech, ash, lime and many other tree species, whilst even in the less-wooded landscape of southern Herefordshire visitors are rarely out of sight of Haugh Wood and Fownhope Park on the Woolhope Dome, or the steep woods clinging to the slopes over the bends of the Wye at Capler and Ballingham. Even on the plateaux to the east and the west woodland remains prominent, especially on the fringes of the Forest of Dean and around Trellech.

This landscape first became famous for its natural beauty and a focus for early tourism in the second half of the Eighteenth century, along with Snowdonia, the Lake District and the Highlands of Scotland. Visitors joined the Wye Tour, a two-day journey by boat from Ross to Chepstow, during which they cast appreciative eyes over the rugged scenery, scrambled over the ruins of Goodrich castle and Tintern Abbey, climbed to viewpoints from the Kymin and the Wyndcliff, and wrote their diaries. Those with an artistic bent also produced sketches and watercolours according to picturesque rules drawn up by that famous arbiter of taste, William Gilpin, the vicar of Boldre in the New Forest, who took the Tour in 1770 and twelve years later published his “Observations on the River Wye…” (1.2).

Gilpin, like modern visitors, regarded the woods as key elements in the landscape. He thought the key ‘circumstances’ of the Wye Valley scenery were ‘the lofty banks of the river and its mazy course’, and identified its four ‘ornaments’ as the ground (i.e., land forms), rocks, woods and buildings, and this largely sums up the modern appreciation of ‘natural beauty’. Closer reading, however, soon reveals that attitudes have changed substantially
over the last two hundred years. Whereas Gilpin and the other Wye tourists appreciated, like us, the dramatic ruins of Goodrich and Chepstow castles and the abbey at Tintern, they also revelled in the bustle and spectacle of the iron works at New Weir and Tintern. Likewise, they did not see the tall and apparently natural woods that line much of the valley today, but accepted the numerous patches of felled woodland and welcomed the distance and perspective that the smoke rising from numerous charcoal-burners’ hearths lent to the rugged scenery all around.

However, as the opening quotation illustrates, some Wye tourists were clearly struck by the wildness of the scenery in general and the woods in particular, and this ‘natural’ perspective contributed more to modern sensibilities than Gilpin’s acceptance of industry and development - even to the extent of following Coxe in excluding Monmouth from the Area of Outstanding Natural Beauty (AONB). Today, we appreciate the woods for their apparent naturalness and require that forestry operations impinge as little as practicable on the view, or at least respect the natural configuration of the land.

Since the mid-19th century the woods have also been appreciated for their wildlife and natural features. In particular, the Woolhope Naturalists’ Field Club frequently searched the woods for interesting plants, animals and fungi, and investigated the geology of its rocks and land forms. This tradition has since developed into the modern appreciation of biodiversity and the concern for wildlife conservation, that generates nature reserves, designations and special measures for Horseshoe bats, dormice, fritillary butterflies and other rare and vulnerable species that depend on the woods for their survival. Indeed, the core woods of the Lower Wye Valley are now regarded as one of the most important concentrations of ancient, semi-natural woodland in Britain.

The woods, however, are not just objects to look at, places to visit and enjoy, and habitats for wildlife. For millennia they yielded firewood, fencing, building materials and other woodland products, and even in today’s depressed market for home-grown timber, they remain sources of hardwood and softwood. Woodland managers must therefore satisfy many different needs, some of which work together, but others of which require choices to be made. The outcome in any particular wood is generally a compromise that tries to balance one need against another, neither a nature reserve nor a timber factory, but something in between. Inevitably, because the social, economic, biological and policy context in which management choices are made is constantly changing, detailed prescriptions can only be temporary.

This booklet describes the main features of the woods; summarises how their present condition developed; identifies the features of importance; characterises present trends and threats; and reviews opportunities and options for management. The focus is on the woodlands within the current boundary of the Wye Valley AONB and the Wye Valley woodlands Special Area of Conservation (SAC) at its core, but mention is made of woods nearby where these are clearly part of the same natural group as the woods of the AONB itself. The general aim is to provide a review of current conditions and understandings that will be of enduring value to those who must balance the various needs and pressures that determine how we manage these woods.
WOODLAND CHARACTERISTICS

How much woodland?

Woodland occupies about 26% of all land within the AONB, i.e. it extends to about 8440 ha of woodland of all types, including scrub and parkland. For comparison the national average is 11%. Its distribution is far from even: the Gorge and Highmeadow (where woodland occupies 48% of all land) (2.1), Trellech Plateau (34%) and the core of the Woolhope Dome are all particularly well-wooded, whereas the Herefordshire lowlands (14%) and the plateau between the Gorge and the Dean (13%) have less, and the Wye floodplain above Goodrich has very little indeed. In addition, the extensive Buckholt Woods come down to the Wye at Monmouth, but lie outside the AONB.

<table>
<thead>
<tr>
<th>THE EXTENT OF WOODLAND IN THE LOWER WYE VALLEY AONB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area of all woodland (in hectares)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>of which:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Broadleaved woodland</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Conifer woodland</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mixed broadleaves and conifer woodland</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Felled woodland</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Young trees</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Scrub</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Ancient woodland</td>
</tr>
<tr>
<td>Semi-natural (ASNW)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Plantations (PAWS)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Sites of Special Scientific Interest</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Wye Valley Woods SAC</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Managed by the Forestry Commission</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1 hectare = 2.47 acres</td>
</tr>
<tr>
<td>Source: Forestry Commission</td>
</tr>
</tbody>
</table>

Woodland occupies the great majority of the steep sides of the gorge, and much of the immediate surroundings. In fact, in walking from Goodrich to the outskirts of Chepstow one need hardly leave woodland, save for a couple of river crossings and a short, furtive traverse along tree-lined hedges. In these circumstances it is almost meaningless to think in terms of individual woods, except perhaps as historical units, and in this sense the AONB includes some very large individual ancient woods, notably Haugh Wood, the former Hadnock Wood (now part of Highmeadow Woods) and Chepstow Park Wood.

The woods are mixed in the forestry sense that they contain both broadleaved and coniferous woodlands. In fact, nearly 40% of all woodland is either dominated by conifers or has a substantial fraction of conifers mixed with broadleaves. Conifers were far less prominent immediately after the Second World War, when the woods were mainly mixtures of oaks and other native deciduous trees, but they were extensively planted thereafter and reached a peak in the 1980s, since when many have been replaced by broadleaves.

Some woods have been destroyed, such as the core of Bolstone Wood, which was cleared for agriculture, and the portions of the former Highmeadow estate woods near Scowles that have vanished into Stowfield limestone quarry. Conversely, new woodland has developed, principally by natural invasion by trees and shrubs into neglected commons and abandoned small fields. Visitors to
Symonds Yat Rock have a grandstand view of one example at Coppet Hill, where a small plantation and extensive scrub woodlands now occupy much of what until recently was open common pasture.

Ancient woodland

Although the pattern of Wye Valley woodland has always changed in detail, the broad distribution of woodland has remained astonishingly unchanged. Search back in old maps, ancient estate documents, parish archives, the surviving land management records of the medieval monasteries, and much else, and one finds more or less the same woods, often with the same name, running back through history until the records peter out.

In fact, an unusually high proportion of the AONB woodlands are ancient, i.e., the woods have existed in some form continuously since at least 1600, and in many cases may well have existed continuously for several thousand years. This does not mean they have been untouched. Indeed, they survive partly because timber and small wood was harvested throughout their history. Thus, most of the larger woods are predominantly ancient, and the chain of woods down the sides of the gorge would have been even more familiar to our medieval predecessors than they are to modern residents and visitors.

The ancient woods are generally richer in wildlife and historical associations than recently originated, secondary woods, so, during the 1980s, the Nature Conservancy Council compiled an inventory of all those over 2 ha. Historical research is always incomplete, so the results remain provisional, but the latest estimate gives 6185 ha of ancient woodland for the AONB (Table). After excluding scrub and parkland, this indicates that about 75% of all the woodland in the AONB is medieval woodland that has remained part of the landscape for at least 400 years. Expressed another way, some 19% of the AONB is occupied by ancient woodland, which is the highest proportion of all the 40 AONBs in England and Wales.

Where did these medieval woods come from? Some were recorded in Domesday Book in 1086, and a very few even earlier, but further back is all archaeology and speculation. However, recent studies of peat deposits bordering the Severn have revealed that woodland survived throughout the prehistoric millennia as mixtures of hazel, lime, oak, elm, ash and a few beech (2.2), in fact, much the same composition as the ancient woods we inherited from the Middle Ages. Archaeological
remains show that parts of the ancient woods have been cleared and restored, but even so there are good grounds for believing that much of the ancient woodland is directly descended from primaeval woodland, albeit used and modified (2,3).

The principal secondary woods originated during the 19th century. The most extensive were planted on the heathlands between Trellech and the Wye where, until recently, they took the form of extensive conifer plantations, permeated by regular, wide rides and forest roads. Around Staunton, ordinary farmland was planted as extensions to the woods of the Highmeadow estate. Otherwise, secondary woods are mostly small expansions onto farmland, particularly onto small fields in and around the gorge and close to other large woods.

Ownership

The Forestry Commission manages the principal woodlands. To the east of the Wye this includes most of the woodland along the Limestone portions of the gorge, the hinterland of large woods around Staunton, much of Tidenham Chase, Bishopswood, and Haugh Wood and its satellite woods. To the west of the Wye the extensive Tintern Crown Woods became part of the Forestry Commission estate in 1924, and have remained with the FC ever since, though they are now formally controlled by the Welsh Assembly Government through Forestry Commission (Wales).

Several woods have been acquired by conservation organisations. County Naturalist Trusts have several woodland reserves, notably Lea and Pagets on the Woolhope Dome, Croes Robert on the Trellech plateau, and Lancaut in the gorge. Natural England owns Highbury Wood near Redbrook and parts of the Hudnalls near Brockweir, and has long-standing interests in Forestry Commission woods of Lady Park in the upper gorge. Likewise the Countryside Council for Wales and Forestry Commission (Wales) manage the Blackcliff and Wyndcliff woods in the lower gorge.

The privately-owned woods fall roughly into three broad types of ownership:

- Forestry Estates, such as Harewood End, Troy and Bigsweir. Characteristically, such estates have a history of sustained timber growing and today hold a mixed patchwork of mature and young plantations, mixed with some semi-natural woodland.
- Farm-owned woods, often left as unmanaged, native woodland, but sometimes important as game coverts.
- Small ownerships. These often form part of a land holding acquired with a house, or, less often, a small wood bought as a ‘hobby’. They seem to be concentrated around the dispersed settlements along the gorge at Leys Hill, Doward, Kymin, Whitebrook, Llandogo, Brockweir and Tintern. Recently in Monmouthshire, forestry companies have bought woods in order to split them up and sell on to individual ‘hobby’ owners.

Diversity in the Wye Valley’s semi-natural woods

Bud-break in the upper gorge highlights the variety of tree species in the native woods

The irregular distribution of small-leaved lime stands out in the woods above Bigsweir Bridge

Wild Service tree leaves in the litter of a Herefordshire wood
Types of semi-natural woodland

The semi-natural woods along the gorge are dominated by beech, oaks, limes and ash. Wych elm was also prominent, but in the 1970s disease killed almost all the large elms, and now this species is largely confined to the underwood. Other species are conspicuous in small patches, notably the groups of wild cherry that produce startling patches of white blossom in spring, and the dark yews that congregate around the limestone outcrops.

The mix of species in the gorge woodlands is almost unknown elsewhere in Britain. A basic set of beech, sessile oak, pedunculate oak and small-leaved lime with an underwood of hazel, grows in a variety of combinations, whose exact composition was determined partly by how the woods were treated in the past. These species are joined on strongly acid soils by birch, rowan, holly and yew; on moist, deep soils by ash, wild cherry and wych elm; and on dry, alkaline soils by field maple, large-leaved lime, wild cherry, holly and yew. On the most extreme limestone crags, woodland is reduced to a form of scrub that includes whitebeams, dogwood, spindle and wild roses.

Away from the gorge, the semi-natural woods are more conventional. The Tintern woods are largely mixtures of beech and oaks with few limes, or just birch with sessile oak. The Herefordshire woods are commonly dominated by ash or oaks, diversified with wych elm, maple, hazel and groups of limes, but containing few beech. The core of Haugh Wood is essentially birch-oak woodland on strongly acid soils.

The patches of ‘wet’, alder-dominated woodland amongst these ‘dry’ woods are often forgotten. Alder is usually associated with swampy hollows, springs, river banks and stream sides, where it is often the dominant tree in a mixture with tree willows, ash and pedunculate oak, but it also grows in a mixture with ash, wych elm, hazel and other species on apparently dry slopes, where water moves in the sub-soil. Wet alder woods may once have been common on the Wye floodplain, but they were largely cleared in prehistory, and now they survive mainly around the Mork Brook, Hudnalls, Whitebrook, Pentaloe Brook and other small tributaries, and as a reconstituted alder wood on former floodplain marshland at Coughton. The apparently-dry woodland containing alder is quite common on the lower slopes of the gorge woods growing on sandstone.
This diverse array of woodland types is formally expressed as communities recognised in the National Vegetation Classification (2.4) [Box above]. The majority of the woods fall within the ash-oak types (W8, W10) and the beech types (W12, W14), all of which are found more in the English midlands, East Anglia and south-east England.

Unfortunately, the distinctive character of the Wye Gorge is masked by the National Vegetation Classification. Partly this is because the Wye runs through the borderland between the wet, cool ‘uplands’ of the north and west, and the warm dry ‘lowlands’ of the south and east, so the valley’s woodland communities tend to be atypical versions of types that are defined elsewhere. Partly, too, it is due to the co-occurrence of abundant lime and beech, which is virtually unknown elsewhere in Britain.

The local combination of beech, both native oaks and both native limes, all as naturally-occurring dominants, has more in common with some mixed deciduous woodlands in Continental Europe. There such woods are formally known as ‘Tilio-Acerion’ woodlands, a name that expresses the consistent presence of limes and maples (including sycamore) and the failure of beech to become dominant. This, a localised and generally species-rich type that is particularly associated with steep
valley sides on limestone, enjoys special protection under European legislation, and on this basis many of the Wye gorge woods have been included within a Special Area for Conservation (see below), and have attracted European funding under the LIFE – Nature programme as the Ravine WoodLIFE Project.

Designations

The importance of the woods for nature conservation is recognised by two designations. Several woods have been scheduled since the 1950s as Sites of Special Scientific Interest (SSSIs) (2.5). These are recognised as nationally important as good examples of particular semi-natural woodland types, or habitats for particular rare and vulnerable species.

During the 1990s, the richest woods were listed as part of the Wye Valley Woods Special Area for Conservation (SAC) (2.6) as examples of Tilio-Acerion woodlands. This woodland type is uncommon and localised in Europe as a whole, and is generally rich in wild species. In fact, the Wye woods also contain a second SAC for the Greater and Lesser Horseshoe bats: the Lower Wye supports some of the largest colonies of these rare European species, and several of the places they use are caves and mineshafts in the woods. The River Wye is also a SAC, mostly for its fish species, but also for otter which make good use of the wooded bank sides.
The structure, composition and distribution of the woods we see today have been shaped by millennia of exploitation and management. Even Mesolithic people made some inroads into the original, natural woodland cover, and, from the agricultural revolution of the Neolithic onwards, the impacts of people have been overwhelming. The main clearances took place in prehistoric times, and by the time of the Norman Conquest, the main features of the woodland pattern we have today were established (3.1). Throughout the historical period, the gorge and its surroundings, together with the Woolhope Dome, have remained very well wooded, whilst the Wye above Goodrich and the surrounding Old Red Sandstone country has retained scattered woods.

Outline of woodland history in the Lower Wye valley

The complexities of this history can be understood by recognising four stages, which in the panel (right) are listed in the sequence by which they first appeared in the Lower Wye Valley. These stages undoubtedly simplify the long-term history of the region’s woods, but they provide a framework for understanding the different types of woodland we have today and for assessing their significance. Most ancient woods have passed through stages I and II to III, many have continued on to IV, and some of the latter are reverting to III. However, any historian of the countryside will quickly appreciate that there were many detailed variations on the theme – so much so, that the history of each individual wood is unique.

We must also recognize that the pattern of woodland changed in detail over the millennia, and that this had important ecological consequences. The general trend from the late Mesolithic clearances onwards was towards less woodland, but at certain periods and usually in small patches, woodland returned to land that had previously been cleared for cultivation or grazed out by cattle and other domesticated animals. Some of the present-day woods may trace their lineage continuously back to the pre-Neolithic natural forests, other ancient woods originated as early instances of woodland restoration. Thus, Domesday Book records in 1086 several instances of new woodland in the Archenfield district west of the Wye on land ‘ravaged’ by the Welsh. We presume that this was natural regrowth, when pasture or cultivated ground ‘tumbled down’ to woodland, but after the 18th century most of such secondary woodland was deliberately created by planting.
Wood pastures

These are the remnants of the wooded waste (stage II) that survived into historical times. Originally, they were the unclaimed lands, used in common, and generally situated on ground that was infertile, difficult to cultivate, or simply too far from places where people had settled. Wood-pastures of this kind were whittled away by legal enclosure, illegal assarting and by squatters, who settled on the unclaimed land if they had nowhere else to live. Despite attempts to regulate their exploitation, commons were eventually overgrazed to the point where their tree cover vanished.

In medieval times, two great wood-pastures surrounded the gorge, the Forest of Dean to the east and Wyeswood on the Trellech plateau to the west, the core of an irregular tract of wood-pasture then extended from north of Monmouth south to Wentwood. Medieval descriptions of the Dean (3.2) show it to be a mosaic of dense groves, tall forest and open woodland with ancient trees irregularly distributed amongst extensive glades. Patches of coppiced woodland intermingled with open groves, and both were grazed as commons by deer and domestic stock. By the 17th century, grazing must have been seriously inhibiting regrowth, for parts of these wood-pastures had been enclosed as coppices and in the Dean much of the ground was later enclosed to protect young timber plantations. By the 19th century, most of Wyeswood was treeless heath, and this was enclosed as farmland, leaving fragments now known as Cleddon Bog and Whitelye Common (3.4). A similar sequence of events left the eastern half of Coppet Hill as enclosed woodland and the western half as open heath; on the Doward, part was enclosed as Lords Wood coppice, and the rest eventually became a mosaic of tiny fields, small woods and houses.

Surviving archives indicate that medieval woodlands in the Herefordshire part of the Wye Valley also showed little distinction between wood-pasture and coppice. However, the multiple uses, including grazing, enclosed coppice, and large trees, would sometimes conflict, as at Lyndenor wood (Foy) 1369 where the coppice was worthless “because of the shade of trees” and the wood’s value was further diminished because “there was common grazing all year”. Parks, too, could include enclosed coppices, as at Fownhope Park whose “coppice was worth 5s” in 1375 and which was presumably the part of the park that became Fownhope Park Wood by Elizabethan times.

Some of the wooded waste was incorporated into deer parks and retained as wood-pasture, where some pollarded oaks eventually developed into gigantic trees. The best surviving examples in the region are Kentchurch Park, in the Monnow valley, and Moccas Park, higher up the Wye Valley. By the 17th century, a new form of parkland developed as an embellishment to great Country Houses, designed according to the fashions of the period. Parks at Piercefield, Bigsweir and Yatton remain. Tracts of ordinary farmland and scattered woods were reconfigured, trees were planted as groups and scattered individuals, and the land was used as pasture – de facto wood-pasture. At Little Doward, the wooded common was enclosed as a deer park in the 19th century: this is no longer a deer park, but impressive beech pollards and many species associated with pasture woodlands remain.
Unusually, several commons in and around the Lower Wye remained at least partially wooded into modern times. The most extensive of these was the Hudnalls, where extensive woodland survived on the steep slopes after the rest of the wooded common was settled two hundred years ago (3.5). The woods were both grazed and cut as coppices by parishioners until well into the 20th century – a true medieval survival - but now they have been allowed to grow into tall forest. Several other small commons remain in Hewelsfield, Welsh Newton and other parishes.

Coppices

Some of the wooded waste was cut down and allowed to grow up again from the stumps in prehistoric times, but formal coppices were not created until the Middle Ages, when large patches of wooded waste were enclosed. Enclosure enabled grazing animals to be excluded in the 5-7 years after felling, and this enabled new growth to prosper and the coppices to be more productive. With so much wooded common land, coppice formation continued late in the Lower Wye Valley. Thus, the wooded common on the Doward was enclosed in the 18th century, and the portion that went to the lord of the manor became a coppice known as Lords Wood. There were even very late survivals of informal coppicing in common woodland, and in the Hudnalls it has never really ceased. In some instances, the wooded waste was enclosed as a park in the Middle Ages, and later converted to coppices, e.g., Lady Park Wood, which is now a natural reserve, and Chepstow Park Wood, which is now largely under conifer plantations.

Haugh Wood was a fine example of a large coppice (3.6). By the early 18th century, it was subdivided into 22 compartments and cut on a regular 20-year cycle, one compartment at a time. By the time it was cut, the underwood of oak, ash and hazel had grown into a thicket of poles, and after repeated cuttings, each tree had developed a thick stool from which new shoots grew vigorously into a new thicket. At each cutting, a scatter of oak...
A series of old maps of Lyndor Wood shows that How Caple Wood to the north originated in the 19th Century.

Multi-stemmed trees inherited from former coppice management. The lime cluster (below left) is a single individual, probably much older than the boundary pollard (below right). The dense grove of beeches (top right) may comprise several individuals.

This history was repeated with local variations in all the coppices down the Wye. Around 1800, most were cut on a 12-14 year rotation, leaving the oak coppices of Herefordshire to be cut at longer intervals (3.7). Cutting was not always regular: thus, for example, the whole of the 762 acres of Hadnock Wood was cut in the four years between 1601 and 1604, a colossal harvesting that left the wood far more open than it is today (3.8). Nor was cutting always done well: for example, in the 1720s, some coppices in Cadora Woods had been damaged by cutting too high (3.9), and the effects of this can still be seen as tall lime stools or “stubs”, persisting amongst the 1960s conifers. The uses for the timber, poles and brushwood were many and various: thus, whilst much of the early 20th century produce from Caswell Wood (opposite Tintern Abbey) went for firewood, particular species and sizes were used for ladder rungs, musical instruments, agricultural implements, barrels, crate rods, and much else (3.10).

Most coppices were made up of the trees that grew naturally. There was little need to plant underwood, and even the oaks regenerated well when the underwood was cut. During their heyday, coppices remained an open patchwork of thickets of different ages of growth under a scatter of spreading oaks, all permeated by open, grassy rides. Limes, oaks and other trees on the boundary banks were pollarded and grew fat trunks, whilst in the coppice such species developed huge stools, many metres across.

Coppice management declined and virtually died out during the 20th century. Most of the coppices were still cut until World War II, but thereafter they were progressively neglected. For a
time, some provided pulpwood to the paper mill at Sudbrook, but this was always a precarious outlet, and in 2006 the factory closed. Many semi-natural woods have grown tall since they were abandoned, but their coppice history is still obvious in the large stools, multi-trunked trees, and the old standard oaks, whose crowns are now much reduced by shade from the overgrown underwood.

In the last 20 years, coppicing has been revived in a few woods, such as the Gwent Wildlife Trust’s Cross-Robert Wood, where charcoal is again made, and the Woodland Trust’s reserve below the Fiddlers Elbow. Other overgrown coppices have been heavily thinned, and should, deer willing, develop into a dense version of coppice-with-standards. Below the Wyndcliffe, some of the tall coppice has been felled, thereby releasing the oaks from competition and recreating a sample of the traditional coppice structure.

**Broadleaved high forest**

Groves of oak, beech and other broadleaves, grown to full height in dense stands, were rare until the 19th century, but as coppicing declined, so some woods were deliberately changed from coppice to high forest. This policy was adopted in the Bigsweir Estate woods in the 1870s, when oaks were evidently planted into the coppices, and a fine example of the result can be seen in the Woodland Trust’s Bigsweir Wood. In the 1890s, this also became the general policy in the Tintern Crown Woods, where beech was promoted as the principal timber tree (3.11), and we now enjoy numerous tall beech-oak dominated woods from the Fedw through to Tintern and on to the Hael Woods below Penallt. In the Highmeadow Woods and on Great Doward, oak was favoured from the early 19th century and beech was promoted in the remaining coppices from the 1890s, and, though most stands have since been replaced by younger plantations, some fine relics of the earlier policies remain.

Since the 1930s, the neglected coppices have grown tall into a form of high forest, and until recently this was the predominant state of the ancient coppices. Latterly, however, some, such as parts of Fownhope Park Wood, Capler Wood, Birch Wood and Bolston Wood, have been thinned and the tall growth on old ash, lime and oak stools has been singled to leave one trunk on each rootstock.

**Conifer plantations**

Planted conifers have been part of the Wye Valley landscape for over two hundred years. The Beaufort Estate planted larch and pine in the woods and on the heaths between Trellech and Tintern, Llandogo and Penallt, and some fine larches from this era can still be seen in the hinterland of Whitebrook (3.12). However, the principal spread of pine, larch, spruce, Douglas-fir and others took place in the 20th century, particularly after 1945, when many of the larger woods were changed from coppice to plantations.

The largest conifer plantations were established in the Forestry Commission’s woods. Chepstow Park Wood, for example, was almost wholly converted to conifers, together with the woods on the Trellech heaths. Likewise, the Highmeadow woods were partially replanted with conifers, and on the Woolhope Dome, much of Haugh Wood and West Wood followed suit. The Forestry Commission also promoted similar conversions in private woodland. Thus, for example, most of the woods between Redbrook and Bigsweir were replanted with Douglas-fir about 1970. Although many of these plantations have recently been felled, conifers still dominate large parts of Wye Valley woodlands.
Recent restorations

After 1985, two kinds of restoration became increasingly apparent. Conifers in the ancient woods had changed the scenery, shaded out the ground vegetation, and impoverished the wildlife, so some were earmarked for restoration to native broadleaves. In particular, the Forestry Commission removed most of the conifers from Haugh Wood, leaving open rides and clearings for butterflies and allowing native birch, ash and others to regenerate in the vacated ground. The Woodland Trust completed the purchase of Cadora Woods and has started the long process of clearing the conifers, freeing the surviving native broadleaves, and promoting new broadleaved growth.

Elsewhere the aim is to restore heathland. This is a much reduced habitat, but conifer plantations on former heaths at Beacon Hill, Tidenham Park and Broad Meend are being felled, grazed and allowed to regenerate naturally. The restored heaths initially take a bracken and gorse-infested form, but heather, bilberry and other heathland species are spreading slowly into the vacated ground.

Woodland composition

Until the 18th century the woods were made up of native trees and the sweet chestnuts introduced before the Normans. Thereafter new species were increasingly introduced into parklands and plantations, from which some have spread naturally. Sycamore in particular is now widespread and thoroughly naturalized, whilst laurels and rhododendrons are spreading locally. The distribution and abundance of oak, beech and other natives has been altered by planting, and the Scots pine, which was present in prehistoric times, has been re-introduced.

Farmland trees

Trees and woodland habitats also occur in farmland, particularly as hedges and along old lanes. Trees were not confined to boundaries, but were commonly scattered within fields, including such notable specimens as the Newland Oak (3.13). Non-woodland trees were commonly cropped as pollards, so well-treed farmland came close ecologically to parkland. Today, non-woodland trees have been much reduced, but the Lower Wye still retains a substantial stock of veteran pollards, notably many limes.
WOODLAND ARCHAEOLOGY

Woods contain a wide range of historical monuments (4.1). Some record the history of the woods themselves, whereas others mark unrelated activities in and around the present-day woodland. Woods may also contain deposits from which the long-term history of the wood and the landscape as a whole can be reconstructed.

Ancient earthworks

Construction of the major prehistoric and early historic earthworks must have displaced woodland, but several were located in or close to ancient woods and have been recolonised by woodland that may be close to the original composition. Bronze Age barrows have been identified in Hale Woods and Little Doward. Iron Age fortifications are still prominent in Spittal Meend (Lancaut), Pierce Wood, Little Doward, Symonds Yat, Chase Wood, Capler Camp, Dinedor Hill, Cherry Hill (Fownhope) and elsewhere. Offas Dyke passes up the lower valley on the Gloucestershire side, where sections are clearly visible in Caswell Woods, Hudnalls, Bigsweir and Cadora Woods and Highbury Wood. Many other banks and tracks exist in woods, some of which are probably prehistoric. Many woods lie on parish, estate and county boundaries, which are remote locations where well-defined boundaries would have been desirable. Being in woods where they were protected from ploughing, the many linear earthworks have been well-preserved.

Industrial relicts

Metal extraction and processing has long been a feature of the district, and it has bequeathed a legacy of quarries and other mining remains. The oldest are the scowles, which are labyrinthine, open cast iron workings in Limestone, some possibly of Roman origin. Good examples can be seen in woodland at Clearwell, Scowles, Dingle Wood, Lady Park Wood, Symonds Yat West, Doward and even above the Blackcliff in Minepit Wood. The metal-working industries themselves were located along the valleys at Bishopswood, Coed Ithel-weir, Tintern, Whitebrook and Redbrook (4.2), where many of the remains have become covered in trees, together with the associated dams and pools.

Mill stones were fashioned from the Conglomerate outcrop between Hadnock and Brockweir, and most seem to have been made in woods. Trees have closed over the small quarries and heaps, but a few mill stones still lie on the ground, where they are vulnerable to collectors. Limestone was quarried throughout the outcrop, especially in woods. Today, shallow workings and small quarries are found in almost all woods on limestone, together with lime kilns. These were common throughout the AONB, but many have been destroyed, and most have deteriorated substantially, but good examples survive in Highbury Wood. The early, large quarry in Pen Moel Rocks is now abandoned, leaving spoil heaps, quarry faces and rusting machinery to be colonised by woodland. In addition, most woods contain small marl pits and sand pits.
Woods are commonly located on rocky outcrops, boundaries and wastes, all places where quarrying would have been worthwhile and convenient, so a strong association between woods and quarries is to be expected. Quarries can rarely be dated, but a few would be Roman and many would be medieval.

Large trees often survive on the margins of quarries, notably on the rock towers left in the scowles.

**Tracks in woods**

Ancient lanes sometimes run in and by woods. On slopes these commonly take the form of sunken ways, up to 4m deep: particularly good examples survive along parts of the Coxbury and Wyegate Lane, the lane from Coxbury farm down through Cadora Woods towards the river crossing at Whitebrook, the old main road between Staunton and Monmouth, the southern edge of Red Grove leading to Bigsweir, and the Roman road in Alcove Wood that was part of the Gloucester to Caerleon highway. Many of the lesser tracks were probably used to extract wood.

**Farming remains in woods**

Paradoxically, several kinds of woodland earthwork are associated with farming and settlement. Secondary woodland has grown over old fields around Staunton, leaving fields boundaries below the trees. Extensive remains of 18th century squatter settlements survive in the Hudnalls as house sites and walls containing ancient stub trees. Secondary woods often overlie cultivation remains, i.e. ridge-and-furrow, and fossilised ant-hills formed in previous pasture. The small streams were frequently harnessed to grind corn: in the woods around the headwaters of the Slade Brook the remains of a corn mill, complete with a dam, leat and return stream are still clear.

**Earthworks of traditional woodland use & management**

Some woodland earthworks were directly associated with woodland management. In Herefordshire, where woods existed in a matrix of farmland, boundary banks with hedges were needed to keep stock out, and these survive as banks with external ditches. In and around the gorge, boundary banks were less necessary, and indeed many were made to enclose the adjacent field, so these survive as banks with ditches on the woodland side. The larger blocks of woodland were also sub-divided into separate, named woods, each bounded by a bank to control stock movements (see Haugh Wood, above). Moated sites in, for example, Fownhope Park and Trilloes Court Wood, may have been hunting lodges. For centuries the woods provided a source of charcoal for smelting – the extensive woods were as much an incentive
to maintain the metal-working industries as the ore itself – and today the traces can be seen in most medieval woods as charcoal hearths, flat platforms on which the wood was smouldered into charcoal. Cadora Wood has more than 80 charcoal hearths.

Recreation

A few woods contain earthworks associated with recreation and gracious living. The Piercefield Walk is a track cut in the 18th century along the Piercefield Cliff past several attractions, such as grottoes, caves, standing stones and cold baths. At the Alcove, Lover’s Leap and the Eagle’s Nest, the walks led to viewpoints, complete with stone seats and railings. Similar, if less ambitious provisions for early tourism were made in the walks along Coldwell Rocks and the viewpoints over the Cleddon Shoots. There were several other famous viewpoints in woodland, e.g. at the Devil’s Pulpit overlooking a vista with Tintern Abbey, but these have not left visible artefacts. Livox Wood, which overlooks Monmouth, contains a relic of a different kind, an ice house belonging to Troy House (4.3).

Earthworks and natural features as information about woodland history

The value of archaeological features is that they offer an opportunity to understand past societies and the evolution of present circumstances. Analogous opportunities are provided to understand environmental history by more natural deposits in the Wye Valley woods. Undoubtedly, the most spectacular were the caves and rock shelters in the upper gorge, notably King Arthur’s Cave, the Madawg rock shelter and caves at Symonds Yat. These are classic sites for the study of Pleistocene and Flandrian environmental history (i.e. from the last Ice Age onwards), which yielded remains of hyenas, mammoths, woolly rhinos and Stone Age people, but the deposits are now largely worked out (4.4).

Several other deposits in woodland have yielded detailed information, but the potential of the Wye Valley woods has not been realised. Peat bogs and peaty hollows in woodland yield fossil pollen and plant remains: acid sites in the Trellech area and in Haugh Wood must have some potential. Tufa deposits in the Slade Brook and elsewhere may yield fossil remains of plants, beetles and snails. Ancient ponds may hold many secrets in their muddy bottoms, provided they have not been disturbed. Indeed, some in Herefordshire are currently being used to find the remains of beetles from long ago that will give clues about long-term habitat change. The soils buried under banks and other monuments may preserve information about conditions at the time the bank was constructed. In fact, the soils in ancient woodland, which must still be more-or-less natural, are available as reference points for studies of the effects of agriculture on soil properties.
Several features in the woods can be said to be natural, in the sense that they owe their characteristics to natural events and processes, not to people and their activities. The most significant of these are those that developed over centuries or millennia, for, once destroyed, they cannot be recreated in the original form.

**Mixed deciduous woodland**

The feature that is most directly influenced by woodland management is the composition of the woodland and the distribution of individual tree and shrub species. In particular, the ancient, semi-natural woods are highly likely to include ground that has been continuously wooded since the end of the last Ice Age, 10,000 years ago. This opens up the possibility that the trees and shrubs we see in them today have descended directly from the original, natural woodland, and that the present-day range of woodland types would have been familiar to our Mesolithic and Neolithic ancestors.

This bold claim is supported by evidence from the deposits along the fringes of the Severn, which actually contain the trunks of trees that grew in the prehistoric forests that were flooded by rising sea levels 6000 years ago, and peat deposits which preserve the pollen shed by the region’s vegetation down the ages (5.1). These show that the prehistoric woodland on the rising land bordering the Severn was dominated by combinations of oaks, limes, ash, wych elm, hazel, alder and other native trees, in fact much the same mixtures that we see in the ancient semi-natural coppice woods today. Inevitably, there have been some changes, such as the loss of Scots pine, the increase of ash, beech and maple, and the marked reduction in wych elm that followed the 1970s outbreak of disease, but the dominance of limes remains. Indeed, in the 20th century several lime-dominated woods have been allowed to grow up into high forest, a form that may again resemble the structure of the late Mesolithic woods (5.2).

The traditional coppice management, which involved making the best use of ‘the natural growth of the soil’, thus unwittingly succeeded in preserving original-natural woodland types. In addition, it must also have maintained the woodland soils close to their natural state and perpetuated populations of the associated wild fauna and flora, albeit modified by millennia of wood-pasturage and coppicing. Once this long-term continuity of tree-cover and woodland composition is appreciated, it comes as no surprise that the rarer woodland species are found mostly in ancient woods – they must be survivors that have persisted down the centuries roughly where they are now, yet have not been able to colonise the new woodlands.

**Other habitats**

Several other habitats have survived within the ancient woods in a form that appears to be natural, or nearly so. The most obvious are the limestone cliffs, most of which are contained within ancient woods, e.g., Ban-y-gor Rocks, Wyndcliff and the Dowards. These are not just striking geomorphological features, but permanent refuges...
for species of open spaces. True, the rocks have been colonised by introduced plants, such as red valerian and wallflower, but the concentration of wild rose species and other shrubs and the great fans of ivy must be natural features. On cliff ledges and especially on the summits of the Seven Sisters rock pillars, the soils are so thin and drought is so frequent that trees and shrubs cannot grow, so rich collections of herbs have been able to survive, including colourful species, such as common rock-rose, horseshoe vetch and bloody cranesbill.

The woods have also enabled remnants of other ancient habitats to survive. Perhaps the most significant are:

- Springs and headwater streams. In farmland, these have mostly been channelled into ditches, but in ancient woods they remain more natural. Good examples can be found in gorge-side woods, such as Hudnalls. These often support relict populations of invertebrates.

- The seasonal cataract of Cleddon Shoots, complete with its collection of rare mosses and liverworts. These species have only survived because the stream has always been shaded by woodland.

- The marsh above and below the Dropping Well on the Great Doward, together with the tufa on the cliff face itself. The marsh flora has deteriorated since it was first recorded in the 19th century, but it remains a most unusual feature.

- Mire species in the alder wood known as Coughton Marsh. These are the poor remnants of the most substantial mire on the Wye floodplain, which was damaged when the railway was built in the 1960s, when farmland was drained.

- Small Sphagnum mires in Haugh Wood. The two mires, though shallow, have probably taken centuries to develop. They are now drying out due to increased tree cover nearby.

- Bogs at Cleddon and Whitelye. These, the remnants of the ancient wood-pasture of Wyeswood, remained fine valley bogs until forty years ago, but grazing and burning has ceased and they have been partially colonised by trees. In this case the developing woodland constitutes a threat to the natural communities, not a means for their survival, so efforts have been made recently to clear trees (5.3).

**Geological and geomorphological features**

Gilpin recognised the land forms – large and small - as one of the principal ‘adornments’ of the valley, the basis of the distinctive natural beauty of the district. The large-scale features include the incised Wye Valley itself, its great limestone cliffs, and its lesser outcrops of sandstone and Quartz Conglomerate (5.4). The principal limestone cliffs occur in two groups, the upper gorge from Coldwell Rocks to the Seven Sisters, and the lower gorge from Shorn Cliff and Blackcliff down to Chepstow. Apart from the wooded crags on Coppet Hill and the large individual stones left by the erosion of the Conglomerate outcrop, notably the Buckstone, Suckstone and the Hearkening Rocks, the Quartz Conglomerate outcrops are rather less conspicuous, but considerable cliffs are hidden in, for example, the Hudnalls, around the Kymin and in Chase Wood. Below the Blackcliff, a huge prehistoric landslip lies as massive boulders heaped into ravines and mounds below woodland. The cliffs are just the most spectacular components of rugged
hills and steep-sided valleys that were created by the complicated morphogenesis of the Wye and its tributaries. And, the more rugged the land forms, the more they are clothed in woodland.

Until recently, these large-scale features would have been regarded as indestructible, but with the advent of large quarries in the 20th century parts of the valley and its surroundings have been re-configured. One thinks here of the abandoned quarries at Pen Moel rocks and Caswell Wood, Livox Quarry at Tintern that is licensed to remove a whole meander core, and the Stowe and Stowefield quarries at Clearwell and Newland. These quarries are quite different in scale from the small excavations that are found in almost all woods.

Medium- and small-scale features are potentially at risk, not just from quarrying, but also from forestry operations, such as road building. These features include:

- ‘Carpets’ of conglomerate boulders left in woods to the west of the outcrop, which represent the remains of strata that have otherwise disappeared from the valley. Good examples remain undisturbed in the woods below St Briavels.

- Karst features. These include; sink holes (e.g. Bearce Wood); limestone pavement (e.g. Great Doward and Yat Rock); and the various dry valleys in woodland, e.g. between the Dowards and below Common Grove near Rosemary Topping.

- Watercourses sinking into and arising from limestone, such as the Whippington Brook in Highmeadow Woods. Some of these form series of tufa dams, notably in the Slade brook and Millway Grove. One stream forms the marsh and tufa cliffs of the Dropping Well by the Biblins.

- Headwater streams within woodland, many of which must have an unaltered form and flow.

Strata exposed naturally, or in quarry faces, may be important for geological science, especially where they expose clear evidence of geological processes (5.5). Examples with Wye Valley woods include the natural rock faces along the Pentaloe Brook, the medium-sized quarry in Lords Wood (Doward), and the small Swarden Quarry above Prior’s Frome.
Habitats

Woodland habitats are inherently complex. Up to perhaps 10% of the land is not actually covered by trees but lies open as forest roads, grassy rides and natural openings, such as cliffs. This complexity is reinforced in the Lower Wye Valley by ground conditions that vary from steep, dry slopes with thin soils over outcrops, through deep, flat loams to permanently moist hollows, marshes and streams; and by soils that vary from bog peat and strongly acid, infertile sandy-loams over the Quartz Conglomerate to rendzinas and calcareous clay-loams on the limestones.

Then again the tree-covered ground comprises a bewildering range of structures, from open clear-fell areas and groves of young saplings to mature stands with some trees well over 200 years old. Within this, the living trunks and branches provide substrates on which bryophytes and lichens grow, and the dead stumps, fallen branch wood and indeed the larger living trees provide habitats for fungi. Equally, the three-dimensional character of woodland provides an infinity of niches for wild fauna, from wide-ranging species, such as green woodpecker, that require both hollow trees and grassy glades, to ‘mini-beasts’ that live most of their lives in a single leaf (6.1).

Ground vegetation and common plants

For most of the year the ground vegetation of Wye Valley woods is dominated by brambles and widespread evergreens, such as male fern and greater woodrush, but the lasting memories for most people originate in the spectacular displays of spring flowers, that develop before the leaves of the trees have spread to cast the deep shade of summer. The bluebells make the greatest impact, spreading glowing carpets of bright blue through many of the woods on both the sandstones and limestones. Although the vast majority of plants are indeed blue, one can always find a few white blooms, and occasionally also some faintly pink specimens. The other species that brings people out on a summer weekend is the wild daffodil, which is scattered throughout the valley, though it is common in only a few places, such as Whitebrook and Birch Wood.
Several other species contribute to the spring displays. The wood anemone is the first, forming clusters of predominantly white blooms suffused with magenta. On close inspection, the pigmentation of all the flowers in a cluster is found to be equal, but different from the pigmentation of flowers in nearby clusters, and this is because each cluster has spread from a single seed by underground rhizomes, forming a clone that may be longer-lived than the trees. A similar pattern can be seen in dog’s mercury, whose flowers are inconspicuous, but whose leaves form dense spreads of brilliant green early in the season. In this species it is the leaf form and sex – the species has male and female plants – that is uniform within the cluster, but different from adjacent clusters. Somewhat later in the spring, ramsons or wild garlic produces dense, equally bright green spreads, and then fine heads of pure white flowers. These vanish rapidly after flowering, leaving virtually bare ground, but as they decay they become slippery and odorous, a hazard to anyone walking down the steep slopes on which they habitually grow. The familiar primroses also bloom in spring, but they are rarely abundant enough for their pale yellow flowers to form a display. Likewise, the common violet is widespread and readily recognized, but it is seen as scattered specimens beside rides, rather than as spreads of colour. However, both primroses and violets, and indeed all the spring species, occur mixed together in a medley of white, green, yellow and blue.

The spring displays are accompanied by several other species that contribute colour, but rarely cluster enough to form displays. Much the most conspicuous is the wood spurge, whose tall stems are filled with milky latex, and whose heads of bright green ‘flowers’ are in fact modified leaves. The flowers are there, but much smaller, sitting like fruit in the bowl formed by the leaves. Growing with the spurge one can usually find yellow archangel, a scrambling relative of the white dead-nettle, and wood sedge, a tufted, grass-like plant with drooping heads. On the limestones, the distinctive wild arum is common, often with the wood melick, a small woodland grass with dark brown florets, and the unmistakable herb paris is frequent amongst the dog’s-mercury. On heavy, poorly-drained soils the tufted hair-grass produces waist-high inflorescences, but this is one to avoid: its narrow leaves are sharp enough to draw blood.

Most of the plants mentioned so far avoid wet and severely waterlogged ground, but such sites produce their own characteristic version of the spring floral displays. The principal components are the pale yellow-green of the opposite-leaved golden saxifrage, and the bright yellows of the kingcup and yellow flag. Colourful though they are, all three constitute a warning to visitors: don’t tread where they grow, for you will sink. Several other species are characteristic of the margins of wet woodland and the hollows in otherwise dry woodland, such as wood speedwell (a pale version of the germander speedwell that grows in meadows and woodland rides), the delicate lady fern, and the robust pendulous sedge. The last often forms dense groves on wet, shady woodland rides, and is one of the few species to thrive in the presence of large numbers of deer (simply because it is too tough to eat).

Not all woods produce spring displays and a rich variety of associated flora. Many neglected coppices have little more than dense undergrowths of bramble, though these have recently diminished in those woods where deer congregate. Some other woods have carpets of ivy: this species is found in
the ground flora of virtually all woods, but on the limestone outcrops and some secondary woods on old fields, it grows so well that it excludes other species. Equally, woods growing on strongly acid soils, notably over the Quartz Conglomerate, support a modified form of heathland containing few spring flowers. Instead, they have irregular ground cover of greater wood rush, hard fern, bilberry, wavy hair-grass (a fine-leaved, silvery-spiked grass) and trailing, scarcely-flowering masses of honeysuckle. Conspicuous flowers do appear if such woods are cut down, notably foxgloves and sometimes also climbing corydalis, a pale form of fumitory.

By high summer, the ground vegetation is often reduced to little more than a scatter of ferns, but in the Lower Wye Valley, and especially around the gorge, these may be abundant and diverse. Of course, bracken is widespread, and can completely dominate the ground cover of woods on heathy soils, but the most interesting assemblages occur on sheltered, rocky sites on the limestones. Here the ground may be covered in hart’s-tongue, with its simple, shining, strap-like fronds, and the not-so-easily-distinguished male fern, buckler ferns and shield ferns. Deer will eat them, but only if there is nothing else, so ferns and spring flowers such as bluebells and ramsons remain in woods where deer congregate.

Woodland plants

For many people the plants that excite are the rare and uncommon species, and the Wye Valley woods have plenty of these. Specialists are particularly moved by the whitebeams, brambles and hawkweeds. Whitebeams are the white-leaved shrubs that grow mainly around the large limestone cliffs: most are common whitebeam, but some - distinguished by leaf shape and fruit characteristics - are very rare species indeed, almost confined to the valley and found nowhere else in the world. Likewise, the prickly scramblers we dismiss simply as ‘brambles’ are in fact numerous microspecies, some of which are known only from the valley. There is, for example, a distinctive Trellech bramble that is known only from the heathy plantations around Beacon Hill. And, on dry banks and limestone outcrops, the hawkweeds – a tall, yellow relative of the daisy – are also variable enough to be split into numerous microspecies. All these, however, are for specialists: there may be no more than a dozen people in Britain who can confidently distinguish one from another.

The orchids are much more interesting for the casual botanist. One of the last sightings of the
ghost orchid was in a wood on the Woolhope Dome. The bird’s-nest orchid, another leafless species, is fortunately still frequent on the Doward and other limestones, together with the greater butterfly-orchid and the early purple orchid. The fly orchid seems to have gone, but the broad-leaved helleborine is still frequent, and the very rare white helleborine and narrow-leaved helleborine survive in a few places. By far the commonest is the common spotted-orchid, a species of meadows and woodland rides. Another species that is sometimes confused with orchids is the toothwort, a pale pink, leafless species that grows in clusters attached to the roots of hazel bushes.

Amongst the other noticeable and interesting species are some rarities that grow best on disturbed soils in woodlands, and often flower strongly after felling. These include the wild form of the well-known blue columbine, the nationally-rare narrow-leaved bitter-cress, the spreading bellflower (a larger version of harebell) and the dainty upright spurge. The latter is so restricted to the southernmost parts of the gorge that it is often known as the Tintern spurge. Two plants are perhaps best not handled, the stinking iris and the stinking hellebore, both of which grow on dry soils on limestone. The woodland margins also support two further native bellflowers, the nettle-leaved bellflower, which is close to its northern limit in the Wye Gorge, and the northern bellflower, which is actually right on its southern limit. Another species on the edge of its range is the madder, like a giant cleavers, which is common enough on the limestone outcrops and wood margins, but elsewhere is found only in south-west England. Lilies occur sparingly: there is little doubt that the scattered patches of lily-of-the-valley are native, but most of the snowdrops are relics of cultivation, and botanists are still debating the origins of the martagon lilies in the woods above Tintern. Likewise, some of the wild daffodils and columbines have escaped from gardens, but most must be native.

This by no means exhausts the catalogue of rare and local species, but most of the rest are inconspicuous or difficult to identify. Perhaps the most notable is the wood fescue, a tall, nationally-rare grass that is common in the Hudnalls and some other sandstone woods in the gorge, mountain melick, which reaches its southern limit in Britain on the Wyndcliff, and wood barley. Three nationally-rare sedges are found mainly on limestone, the fingered sedge in shade, the soft-leaved and dwarf sedges on outcrops. The Tunbridge filmy-fern and the hay-scented buckler fern were extinguished from shady rocks near Ross by Victorian collectors, but the Killarney fern survives as a gametophyte, and the pachyrachis form of the maidenhair spleenwort (which is confined to the Lower Wye) is fortunately ignored on the rocks by the Biblins campsite.

**Bryophytes, Lichens and Fungi**

Fungi and the so-called ‘lower plants’ are important components of woodland biodiversity, but they are not as well known as the flowering plants and ferns, nor as readily appreciated by the general public. A brief review of the highlights is needed to indicate their importance.

Mosses and liverworts are reasonably well represented in Wye Valley woods, and, through
the efforts of a pioneer bryologist, Eleanora Armitage, have been well known since the last 19th century. The gorge woods hold most of the British population of *Selgeria campylopoda* and the only southern population of *Anomodon longifolius*, and both can be found in the upper and lower gorge woodlands. Most of the nationally rare species that occur within the AONB are concentrated in woods, particularly on the main limestone outcrops on the gorge, and in the cataract at Llandogo known as Cleddon Shoots. The tufa at the Dropping Wells (Great Doward) comprises limestone deposited around mosses, some of which are nationally rare. The gorge woods, being shady, close to the sea, and in receipt of above-average rainfall, are notable for oceanic bryophytes growing towards the eastern edge of their range. For example, on the shady limestone cliffs *Marchesinia mackaii* turns the rocks black, and in Cleddon Shoots several oceanic liverworts survive, such as *Jubula hutchinsae* and *Riccardia palmata*. Shaded Conglomerate boulders also support several uncommon species.

Lichens are less well-known, but there seems to be little doubt that the range of species has been depleted by industrial pollution and centuries of coppicing. Nevertheless, small populations are known of those epiphytic lichens that are generally associated with mature timber, particularly deep in the main valley and sheltered side valleys, which were sheltered from pollution. Recent surveys of scattered sites have revealed nationally infrequent species on limestone rocks, on old trees, and on wet boulders in lime-rich streams. The richest sites on present information appear to be the Little Doward and Lancaut.

The fungi ought to be well-known, since Herefordshire, through the activities of the Woolhope Club (6.2), has some claim to be the birthplace of British mycology, but in fact current knowledge appears to be patchy. The most important area is the upper gorge from Coldwell Rocks to Little Doward, where rare and uncommon puffballs, milkcaps, *Cortinarius* species and boletes have been collected, including the *Lycoperdon mammiforme* and the Devil’s bolete, *Boletus satanus*. A detailed survey of Cadora Woods showed that not all woodland is rich in fungi, though even there some uncommon species were found on old trees.

**Woodland fauna**

The two most prominent mammal species were both introduced. *Grey squirrels* replaced the native red squirrels in the 1940s. *Fallow deer* were present before the last ice age, but the present stock were introduced by the Normans. Both species are now more common than ever (see below). *Wild pigs*, too, were once native, but the populations established in Penyard Park and Highmeadow Woods were both recent introductions. Other deer have recently reached the district, and of these *muntjac* is an introduction, whilst *red and roe deer* can be construed as the return of the natives.

**Badgers** and **foxes** are common in woodland, but roam over the countryside as a whole, and much the same can be said of many smaller mammals. **Polecats** have recently re-established themselves in the region, and they too make use of the whole landscape. Bats are more closely associated with woodland, where they use rides and edges for feeding, and may roost in large trees. The Lower Wye Valley supports important populations of the rare *greater and lesser horseshoe-bats*, some of which use woodland for part of the year. The two
SOME WILDLIFE HIGHLIGHTS

Rare endemic Whitebeam species and a strong population of the restricted large-leaved lime.

Massed displays of bluebells, ramsons and other herbs in spring.

Many nationally uncommon flowers, including orchids, bellflowers, sedges, grasses and the Tintern spurge.

Rich clusters of restricted mosses and liverworts on shaded stream sides and limestone outcrops.

Greater and lesser horseshoe bats, dormice, polecats and other mammals use woodlands.

Goshawks in the woods and nightjars in the restored heaths within plantations.

Strong populations of Fritillaries, White admirals and Wood Whites in several woods.

Several restricted species of moth, slug, beetle, flies and other groups found in the ancient woods, and probably others to be found.

Familiar, and peregrines have returned to nest on the cliffs within the woods. Moreover, the once-native goshawk has been successfully reintroduced from Continental stock, and have increased to their maximum possible density. Tawny owls are common in the woods; Herons have maintained a heronry in the woods by the Wye at Piercefield; and even cormorants have become a familiar sight flying over woods along the gorge.

The bird interest of the Lower Wye woods is by no means confined to deciduous woodland. Conifer plantations provide some diversity and in particular have helped to maintain strong populations of crossbill and siskin. Conversely, the removal of large stands of conifers from the plantations around Trellech and near Tidenham have enabled plants surviving from the former heathland, such as gorse, heather and bell-heather, to thrive and spread, and this has attracted pairs of nightjars. Eventually, with the help of seasonal grazing, true heathland will be restored.

Many invertebrate species are much more closely associated with woodlands than most mammals and birds. The best-known groups are

species most closely dependent on the woods are the dormouse and yellow-necked mouse, both of which are species of deciduous woodlands in southern Britain with a marked preference for ancient woodland and overgrown hedges linked to ancient woods. Both are actually widespread, almost common in the AONB, though they rarely reach small and isolated woods in Herefordshire (6.3).

Nightingales have gone, and the lesser-spotted woodpeckers are now rare, but otherwise there is some hope that the birds of the AONB have resisted some of the declines that have been recorded elsewhere in Britain. Green woodpecker, greater spotted woodpeckers, nuthatch and tree-creeper and other hole-nesters are common, the marsh tit population has remained strong, and both the song thrush and the mistle thrush have done better in and around the Lower Wye Valley than in most other districts. Despite a national decline, woodcock can still be flushed in the woods. The commonest woodland species—wood pigeon, robin, wren, blackbird, chiffchaff, blue tit, coal tit— are equally familiar in the garden, together with summer visitors, such as chiffchaff and willow warbler. Two species that are more associated with upland woods to the west, redstart and pied flycatcher, have maintained small populations in the district.

The larger birds use woods as just part of their range, though some actually nest in trees. Raptors and corvids suffered greatly at the hands of gamekeepers and in the face of pesticides, but buzzards and ravens have recovered so well that they are now
butterflies, moths and dragonflies: they are all common enough in woods, but it’s the Lepidoptera that include several woodland specialist species. Sadly, the woodland butterflies have suffered great reductions. The purple emperor was once found in the gorge, but has long gone; the Duke of Burgundy and marsh fritillary were last seen in Haugh Wood in 1981; and the several species of fritillary that were once familiar in the woods along the lower gorge have not been seen for years. All is not lost, however, for a few survived and now special measures are in place in Haugh Wood to sustain the pearl-bordered fritillary, silver-washed fritillary, wood white and white admiral, and there is signs that they are spreading back to secluded, sunny rides in other managed woods.

The moths have also been adversely affected by post-war changes in woodlands. Although several hundred species can still be trapped in individual woods, the decline of coppicing and thus open spaces has been blamed for the loss of Kentish Glory and the orange upperwing, and the decline of several other species. As forest rotations have lengthened, sallows and their many dependent species have declined, and even the loss of mature elms has affected a few specialist species. Nevertheless, the species for which the Lower Wye is famous, the scarce hook-tip, which feeds on lime, is holding its own in the woods between Tintern and Chepstow.

Unfortunately, the most numerous groups of invertebrate have not been thoroughly surveyed, but scattered observations indicate that the woods harbour many rare and local species. The woods, especially those on limestone, are home to many slug and snail species, including species such as the ash-black slug that seem to be restricted to ancient woodland. Rare beetles and two-winged flies, whose larvae are associated with rotting timber, have been recorded from several woods. A hint of what might be found came from Peter Kirby’s recent surveys for the Gwent Wildlife Trust, which located two rare insects in the seepages within Prisk Wood, Adicella filicornis, a caddis-fly and Ellipteroides alboscutellatus, a crane-fly.

**Special protection for species**

Many nationally rare and vulnerable species have been categorised as ‘endangered’, ‘vulnerable’, ‘threatened’ or ‘near-threatened’, and some of these form the focus of individual action plans for their recovery. Amongst those species associated with Wye Valley woodlands, the bird’s nest orchid, narrow-leaved bitter-cress and English whitebeam are ‘near-threatened’, though the first two of these have apparently strong populations in the woods on limestone; the narrow-leaved helleborine is ‘vulnerable’, which means that it is at risk of extinction in the wild; and the round-leaved whitebeam is ‘endangered’, which means that the risk of extinction is higher still. More positively, the dormouse and all bat species are protected under the Wildlife and Countryside Act. Further, others, such as the pearl-bordered fritillary butterfly and the devil’s bolete fungus, are included in the list of species whose survival and protection is guided by national and local Species Action Plans.
The woods are never static. Indeed, changes since the designation of the AONB in 1971 have been particularly substantial (7.1).

With the extinction of traditional management during the 20th century, the structure of the ancient, semi-natural woods has changed. Instead of a cycle of regular cutting, which maintained a patchwork of open spaces, kept the rides open, and prevented most of the trees from growing to full height, most woods have been allowed to grow tall and dense.

At the same time, many hedges have been allowed to become overgrown, and the surviving boundary trees, including most pollards, have developed huge, heavy crowns. As a result, the structure of most of the ancient semi-natural woods is probably more natural now than it has been throughout the historic period; the woods are even more prominent in the landscape than they were in Gilpin’s time; and many woods and individual trees have grown to spectacular dimensions.

These changes undoubtedly contribute to the ‘natural’ beauty, but they mask associated changes that many people would regard as damaging. These damaging changes continued unabated until the 1990s, but latterly efforts have been made to reverse them.

- The loss of clearings and the shading of rides have been responsible for a substantial loss of wildlife species, including the great reduction in the diversity of woodland butterflies. Only Haugh Wood, a very large wood that was kept open after 1945 by regular felling and planting, has retained a semblance of its pre-war butterfly diversity.

- The population of veteran trees is declining. Those in woods suffer from mechanical failure - as hollow trunks eventually fail to support increasingly heavy crown branches – and increasing shade from taller, younger trees. Those in fields are retained if they shade grazing stock, but they are rarely replaced when their crowns break up. Old trees on field boundaries, roadsides and close to houses are removed or trimmed for safety reasons and often replaced, but the replacements are not pollarded, and they are unlikely to achieve the ages of the current veterans. Until recently this trend would have caused little concern, but the high historical and biodiversity values of ancient trees in Britain have now been recognized.

- The loss of clearings and the shading of rides have been responsible for a substantial loss of wildlife species, including the great reduction in the diversity of woodland butterflies. Only Haugh Wood, a very large wood that was kept open after 1945 by regular felling and planting, has retained a semblance of its pre-war butterfly diversity.

- The population of veteran trees is declining. Those in woods suffer from mechanical failure - as hollow trunks eventually fail to support increasingly heavy crown branches – and increasing shade from taller, younger trees. Those in fields are retained if they shade grazing stock, but they are rarely replaced when their crowns break up. Old trees on field boundaries, roadsides and close to houses are removed or trimmed for safety reasons and often replaced, but the replacements are not pollarded, and they are unlikely to achieve the ages of the current veterans. Until recently this trend would have caused little concern, but the high historical and biodiversity values of ancient trees in Britain have now been recognized.
• Vistas have been lost and traditional viewpoints have been blocked. Long-term residents increasingly complain that trees have grown tall enough to obscure the views that they knew in their youth, and villages such as Whitebrook find themselves increasingly in shade. The most famous viewpoint from Symonds Yat Rock has been protected by its prominence, but nearby viewpoints over New Weir and other viewpoints favoured by the Picturesque tourists, such as the Devil’s Pulpit, became obscured by trees and shrubs. Lately, however, the view from the Kymin over Monmouth and the views over New Weir have been cleared of obstructing growth; the opening of Duchess Ride has revealed vistas that had been lost; and the clearance of conifers from Beacon Hill has revealed a great panorama over the Forest of Dean that has not been seen for decades.

• Highway safety has been compromised by the growth of tall trees just above the valley roads. Most of the former coppices on the valley sides were last cut sometime between 1920 and 1950, so it was only in the 1990s that most were reaching full height. Growing on slopes, most had developed one-sided crowns, and as they reached full height they fell with increasing frequency onto the roads below. This problem has, however, been recognized, and recently many of the roadside trees along the A466 between St Arvans and Wyesham have been felled or trimmed. The increased emphasis on safety felling is also in part a response to the increasingly litigious character of modern society.

During the 1960s and 1970s, national forestry policy and economic realities combined to favour widespread planting of conifers, and it was during this period that several prominent Wye Valley woods were reforested as plantations. However, since 1990, when the fall of the Iron Curtain allowed access to substantial timber reserves in eastern Europe and Russia, the prices obtainable for home-grown timber have fallen by more than 60%. At the same time, the value of woodlands for recreation, nature conservation, carbon sequestration and general quality of life has increased, with the result that recent forestry policies at national and local scales have placed much more emphasis on environmental and social benefits of woods and forestry. Moreover, increasing wealth has led to increasing demand for rural land and houses from people who do not need to make a living from the land itself. The outcome today is that woodland management is justified more by its conservation (in the broad sense) benefits, and less by its yield of utilizable timber.

These social and economic trends have had many impacts on the woods of the Lower Wye Valley:

• Native broadleaves have replaced conifer plantations, especially in ancient woods that were planted with conifers after 1945, e.g. in Colonel’s Park, Cadora Woods, Highmeadow Woods, Haugh Wood. This is a long-term process that not only restores the traditional appearance of the woods, but improves them as wildlife habitats. Conifers will continue to be grown commercially on the infertile soils of the Trellech Plateau, but even here some conifers are being cleared in order to restore heathland, e.g. on Beacon Hill.
Increasing ownership of woods by conservation organizations, such as the Woodland Trust, County Wildlife Trusts and Natural England. This trend is reinforced by the many ‘hobby’ owners of small woods who run their woods as de facto nature reserves, and by the special measures taken throughout their estate by the Forestry Commission. In Haugh Wood, to take a specialized example, the Forestry Commission collaborates with Butterfly Conservation to design operations around the needs of butterflies and moths.

Increasing demand for woodland ‘plots’. Woods are partitioned into small plots and sold to different owners. Whatever the long-term aims of new owners prove to be, there is no doubt that this fragmentation of ownership will make coherent woodland management far more difficult.

Increasing recreational use of the woods. This requires car parks, partitioning the use of tracks, and felling unsafe trees.

Increasing extent of woodland that is left untouched. Some ‘unmanaged’ woodland is allowed to grow naturally as a deliberate provision of a nature reserve management plan, but most is simply neglected. Some ownerships are too small to permit forestry operations. Others evidently have no interest in silvicultural interventions.

Despite these changes, some estates continue to manage woods for timber production and game preservation. In the gorge, Bigsweir Estate is felling 19th century oaks and post-1945 conifers. In Herefordshire, the Brockhampton, Peristone, Aramstone and the Duchy of Cornwall (Harewood End) Estates, together with the Trust that owns Fownhope Park Wood, are also managing both hardwoods and softwoods on a commercial basis. At Sellack, the Caradoc Estate is managing the ancient semi-natural, oak-dominated Riggs Wood on a commercial basis (7.2).

The woods are subject to many other trends and threats, of which the most significant are the following:

**Deer**

Red and Roe deer were native to the Wye Valley in prehistoric and early historic times, and Fallow were introduced in the medieval period. For centuries, Fallow were largely confined to forests and deer parks, but in the last 70 years or so their populations have burgeoned and spread, so that they now thrive throughout the AONB, and in some parts are more numerous than they have ever been. Moreover, they are being joined by roe deer and muntjac spreading from the east and south. Despite the annual deer cull, numbers continue to increase. The most recent estimate by the AONB’s Deer Management Group is that 1200 wild deer roam the Lower Wye Valley (7.3).

Attractive though they undoubtedly are, their impact on some parts of the AONB woodlands is little short of devastating. They browse and break saplings to the point where few trees can regenerate, and regrowth from coppice is so restricted that stools eventually die. They also eat low shrubs and the woodland ground flora, and in extreme cases, such as Lady Park Wood, have reduced formerly luxuriant brambles to scarcely-visible remnants, halved the diversity of the ground flora, and laid bare the woodland floor (7.4). Deer do help keep glades open, but they reduce the amount and variety of flowers in open situations, and thus the nectar sources for invertebrates.
Grey squirrels

Grey squirrels colonized the Lower Wye in the early 1940s and have subsequently wreaked havoc in broadleaved woodland. They strip bark from beech, oak, birch, maple and other tree species, scarring the trunks and eventually girdling the leaders. The timber is spoiled; potentially large trees are reduced to little more than tall bushes; and surviving trees are generally so damaged that they have little or no value as timber. Even mature trees are attacked: for example, branches blown from the crowns of mature beeches have almost always broken at scars caused by grey squirrels, i.e. the squirrel is causing premature crown deterioration and compromising public safety. Limes seem to be immune and ash and wild cherry are often spared, but the adverse effects on the longevity, stature, timber value and safety of beech and oak impairs woodland management throughout the AONB.

Grey squirrels do more than compromise timber values, public safety and the very future of oak and beech as major trees. They also have impacts on other fauna. The extinction of red squirrels is an obvious instance, but, as an aggressive predator, grey squirrels may be implicated in the widespread reduction in woodland bird populations, and they may also compete with dormice.

Despite decades of research, no solution has been found, and the best hope is to mitigate the effects by targeting funding on the most vulnerable woods. Observations from the long-term studies of beeches in Lady Park Wood may help here (7.5). Damage is most severe in fast-growing, pole-stage trees, so relief may be obtained by not thinning, or by growing beech below a fairly dense overstorey, at least until they have grown larger than the vulnerable sizes. This will not prevent crown branches being stripped, but at least more trunks might be sound.

Wild boar

Two populations of wild pigs have lately become established in the AONB. A small herd of true wild boar has been established for several years in Penyard Park and Chase Wood. The population remains small and nocturnal, so they keep themselves well hidden, but they are also controlled by neighbouring farmers. More recently, a herd of feral pigs with some wild boar blood was released near Staunton, where, despite poaching, they have started to breed. The cross-breeds were not afraid of people, which some visitors find alarming, and they were quite prepared to visit - and damage - gardens. The survivors are becoming more circumspect, and may now be reverting to wild behaviour.

Attitudes to wild pigs are ambivalent. Whilst they were once native to the woods and may have helped woodland processes, such as oak regeneration, they alarm some people, damage grassland and may infect farm pigs with diseases. At the time of writing, no decision has been reached on possible controls.
Chemicals

The woods are subject to several forms of pollution from activities beyond their boundaries. Where a wood abuts on arable fields, lateral drift of fertilizer and herbicides changes the flora on the boundary. Streams that drain into the woods from cultivated land are often enriched by the leaching of excess fertilizers. Woods near habitations and lay-bys are commonly used as rubbish dumps.

During the 19th and 20th centuries, sulphur dioxide generated by industry in South Wales and the English Midlands apparently killed many epiphytic lichens, leaving only small fragments in deep, narrow valleys, but this source has been much reduced and the lichens are starting to recover. Today, industrial pollutants have been replaced by the nitrogen compounds generated by intensive cattle units which fall in rain, and appear to be altering the ground flora throughout the AONB. Indeed, the nitrogen deposition rate in the AONB is amongst the highest in Britain (7.6).

Climate change

The impacts of climate change on the woods are difficult to assess, but several recent developments have been linked. In 1976 beeches and birches were killed in large numbers by drought, and this has been repeated in recent years. The warmer summers and winters may have contributed to some changes in the distribution of moths and butterflies. The pied flycatchers are declining, perhaps because their nestlings no longer hatch when the caterpillars on which they fed are available (7.7). Two fungi that affect tree growth have increased recently, the Phytophthora that attacks beech bark and the mildew that turns oak leaves silvery in late-summer, thereby impairing both growth rates and seedling survival. Otherwise, there is little sign that the woods have been affected thus far, but predictions of long-term change include fears that beech may not be able to survive in southern Britain, and clearly that would have a major impact in the Lower Wye Valley.

MAIN DIRECT THREATS TO WYE VALLEY WOODS

1. Deer. Dense populations prevent tree regeneration or require managers to fence compartments.
2. Grey squirrels. Strip bark from beech, oak, sycamore, etc. Deforms young trees and damages mature trees.
3. Lack of management. Poor quality tree growth and loss of open spaces and thus habitat diversity.

The indirect effects may soon be noticed, however. Firewood has always been produced from Wye Valley woods and open fires and wood burners continue to be popular features in houses, but modern advances in wood fuel technology have improved the prospects for wood fuel boilers and cookers, and the rising costs of oil-based heating fuels makes wood fuel more financially attractive for both domestic use and public buildings. Furthermore, wood fuel is almost ‘carbon neutral’. Against this background it is reasonable to predict a revival of coppice management, at least in the more accessible areas of woodland, a development that would benefit both the local economy and biodiversity.
MANAGEMENT OPPORTUNITIES AND OPTIONS

General policy

Forestry policies are constantly under review. They change regularly in step with changes in social, economic and sustainability factors. Likewise, management plans for individual woods are regularly up-dated in response to both policy and economic changes and accumulating management experience. Accordingly, this review of management options is presented in general terms, rather than particular actions and quantitative targets, in the hope that the underlying considerations will be of enduring significance.

Woodland management within the AONB is steered by the current Wye Valley AONB Management Plan (8.1), and the various Forestry Strategies and Regional Frameworks (8.2). The latter set the pattern for woodland management nationally, whilst the former sets strategic objectives and targets, not just for woodland within the AONB, but for all other activities and considerations. The latest Plan relates to 2004-2009, but the National Strategies have been operational since 1998, and, as the review of trends (above) makes clear, they have already brought about significant changes, including in woods managed by the Forestry Commission.

The main influence on the management of individual woods is the Forestry Commission, for two reasons. First, as the manager of much of the woodland, including woods which are one or two orders-of-magnitude larger than most other properties, its programme of operations has a major direct impact. Their plans conform to current Strategies, the AONB Management Plan and the UK Woodland Assurance Standards. Second, the Forestry Commission applies controls and offers advice and grants to other woodland owners, thereby ensuring that operations in private woodlands conform to current guidelines and standards. They cannot, however, oblige any owner to carry out any or particular operations, and they cannot control the availability of unwooded land for afforestation.

Woodlands contribute to the beauty of the landscape, provide most of the wildlife habitats, afford access for recreation, yield utilizable timber, and provide for specialist interests, such as game preservation. Balancing these multiple uses requires skill and sensitivity. In broad terms, management aims to be ecologically sustainable, i.e., it seeks to maintain the productive capacity of the site whilst retaining the diversity of woodland wildlife. At
the same time, managers try to operate sensitively - either shaping their felling to the natural form of the land, or operating unobtrusively - in order to maintain the ‘natural’ beauty of the landscape. Subject to these overarching considerations, woodland managers can also aim to grow and harvest utilisable timber, which not only contributes value to society and the economy, but also helps to maintain the diversity of habitats within the woods. Some felling and lopping is also necessary to make woods safe for visitors.

Sustainability

The overarching requirement of woodland management is sustainability – of productive capacity, landscape, recreation, biodiversity and contribution to the economy. In this respect, wildlife is particularly significant, not just because conspicuous and attractive species are there to be enjoyed, but also because they and the multitude of micro-organisms form the key element in sustaining the human environment. Whilst wildlife is far from being the only contributor to sustaining the environment of the Lower Wye valley, its needs form a useful starting point for translating the features and interests of the woods into a strategy for woodland management. The box opposite lists some general pointers, based on observations in the Lower Wye Valley woods, combined with research and observations elsewhere.

Key features of woodland management

These aspirations were formalized in the Wye Valley AONB Management Plan 2004-2009 as eight strategic objectives for woodlands and numerous others for recreation, nature conservation, etc. to which woodlands contribute. Combined with the Forestry Strategies, they provide a basis for woodland management in the AONB.

Native woodland is being maintained or restored where landscape and nature conservation values are high, and in particular in all the ancient woods along the gorge. Save for the yew-dominated woodland below some of the limestone crags, this involves maintaining or restoring mixtures of deciduous, broadleaved trees, such as oak, ash, beech and lime. Where such semi-natural mixtures are still present, forestry operations aim to retain all the site-native tree and shrub species, but where the mixtures have in the past been replaced by conifer plantations, the appropriate native species may have to be planted. By retaining and restoring semi-natural mixtures, the natural beauty will be maintained along side healthy populations of native wildlife species.

Several options exist for managing existing semi-natural mixtures. The ‘default’ option is to adopt ‘continuous-cover’ forestry, i.e. small-scale forestry operations that minimise the visual impact on the landscape. This variously takes the form of repeated thinning; small-group felling; or more intensive felling that nevertheless retains
enough mature trees (known as a ‘shelterwood’) to maintain the external appearance of mature woodland. Thinning and small-group felling favour shade-bearing species, such as beech and lime, whereas more intensive felling is necessary if light-demanders, such as oak, ash, wild cherry and birch are to prosper.

The alternative is to resume traditional management, which in most instances means coppicing, i.e., cutting most of a stand and allowing it to grow up again from the stumps. Coppicing is more conspicuous in the landscape, but it confers considerable benefits for wildlife by favouring the numerous species that thrive in clearings and rides. Coppicing also favours the small trees and shrubs, such as dogwood and broom, which are heavily shaded by continuous-cover forestry, and restores a feature of the Wye Valley’s history. In practice, there may be little difference between coppicing, which traditionally retained standard oaks as timber trees, and shelterwood fellings. Examples of restored coppicing can be seen in Caswell Woods, Fiddlers Elbow and below the Blackcliff. The safety fellings above the road between Redbrook and Llandogo is developing into de facto coppice.

In planted ancient woods (PAWS), the conifers are being, or have been, replaced by native broadleaves. This transformation might be achieved by felling all conifers immediately, but the surviving broadleaves and dead wood within the stand would be damaged by the shock of sudden exposure to wind and sun, ruderal invaders would swamp woodland plants within the clearings, and the new woodland that develops would be even-aged. Better would be to convert in stages, starting by freeing surviving broadleaves from competition, gently increasing light to remaining concentrations of woodland flora, then replacing the conifers over many years by repeated thinning, or in patches. In Cadora Woods, the Woodland Trust has embarked on a long-term (20-year or more) programme of conversion (8.3), and conifers are being replaced by native broadleaves in many Forestry Commission woods on the gorge sides.

Trees and shrubs regenerate naturally once space has been created in the canopy and thereby ‘restock’ the wood, though shade-bearing species may anticipate regeneration opportunities with slow-growing saplings in the understorey. This natural regeneration starts either as seedlings that grow into saplings, or new growth from cut stumps, that generally grows faster than seedlings. Natural regeneration from either seed or stump is the preferred method of restocking in semi-natural

<table>
<thead>
<tr>
<th>Stand</th>
<th>Type</th>
<th>Vol</th>
<th>Main Species</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BHF</td>
<td>600</td>
<td>ash 100%</td>
<td>This area was felled about 17 months to 2 years ago having about 100 ash poles 11-20 yrs standing. There is a strong regrowth of ash from old stools throughout the whole area.</td>
</tr>
<tr>
<td>2</td>
<td>coppice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>devastated</td>
<td>600</td>
<td>hazel holly birch oak ash syc.</td>
<td>Very recently become devastated. Clearance of top &amp; top still going on. When cleared up this area may become either “felled” or, if there is as much regrowth as may be expected BHF or coppice. 1-10 [years].</td>
</tr>
<tr>
<td>4</td>
<td>coppice</td>
<td>600</td>
<td>Syc 30%; birch 30%; ash 30%; SC hazel 10%</td>
<td>Few old oak 120+ yrs on the north border of stand. This coppice is a thicket all about 10-12 years. Not worked.</td>
</tr>
<tr>
<td>5</td>
<td>devastated</td>
<td>600</td>
<td>oak ash SC holly box yew elm NS SP</td>
<td>This area was devastated some time ago and throughout the area fruit trees are now growing. Together with the large quantity of box, laurel, yew and rhododendron the area is more of amenity &amp; fruit value than [for] forestry.</td>
</tr>
<tr>
<td>6</td>
<td>BHF</td>
<td>600</td>
<td>poplar 100%</td>
<td>12 x 12 good crop. Vigorous &amp; high pruned to 18 ft.</td>
</tr>
<tr>
<td>7</td>
<td>CHF</td>
<td>600</td>
<td>JL 100%</td>
<td>Just recently thinned</td>
</tr>
<tr>
<td>8</td>
<td>BHF</td>
<td>600</td>
<td>oak 55%; ash 35%; elm 10%</td>
<td>Understorey of hazel coppice and elder.</td>
</tr>
</tbody>
</table>
Sycamore, an invasive introduced species, being controlled by ring-barking

Lime seedling

Large-leaved lime sapling

Ash seedlings

Young ash saplings

Planted oaks in ‘Tuley’ tubes

woods: it ought to come free, and it ensures a natural distribution of trees in the mixture. Sadly, however, natural regeneration is often impracticable, because (i) deer eat all the young shoots, (ii) bracken and bramble smother seedlings, or (iii) the main tree species fail to set ‘seed’ often enough, or in sufficient quantities. In practice, therefore, fencing and planting are generally necessary, particularly when the aim is restocking of oak. Such planting can still grow as a mixture by leaving, say, 30% of the ground in and around plantations unplanted, for this will fill slowly by natural regeneration.

Western Red Cedar, Haugh Wood

Recording, Lady Park Wood

The emphasis on broadleaves does not exclude conifers. In fact, conifers will continue to be grown commercially on the less fertile soils of, for example, the Trellech Plateau and the core of Highmeadow, where they have long formed the bulk of the stock. This helps to pay for conservation management elsewhere, and provides some diversity in the landscape. It also affords particular wildlife benefits: some species actually prefer conifers, and the short rotation of conifer plantations furnishes a ready supply of open space habitats.

Whatever tree species and silvicultural systems are adopted, the ideal is to maintain a steady programme of felling and restocking. This (i) maintains the habitats associated with clearings and young woodland, (ii) maintains a steady yield of timber and a steady flow of work for forest industries, and (iii) helps to keep trees healthy and safe for visitors. A steady flow of forestry operations also reassures residents and visitors that the landscape will not be subjected to the pulses of rapid felling and replanting, alternating with periods on general inactivity, that characterized woodland management through the 20th century – a form of feast and famine. In practice, the ideal is approached, not achieved, in Forestry Commission woods, and is not achievable in individual small woods, but it can be approached on a larger scale.

Specialised aspects

Whilst the programmes and prescriptions described so far apply to the generality of Wye Valley woodlands, specialised objectives are pursued in some locations. A good example is Lady Park Wood in the upper gorge, which in 1945 was set aside as a ‘natural’ woodland for long-term ecological research (8.4). It has since been left untouched, and detailed observations of how it has responded to natural events, such as the advent of elm disease in 1971 and the drought of 1976, are helping us to understand how natural woodland functions.

It is now standard practice to maintain dead wood volumes in managed woodland, both as habitat and to promote the decomposer organisms that are essential for a healthy woodland. In addition, numerous veteran oaks, beeches, limes and other trees survive in and on the margins of
the woods, which provide habitats for specialized woodland species, visual diversity and a link with past management (8.5). Many are pollards or ancient coppice trees, and some must be several hundred years old. Every effort is being made to maintain them, by freeing them from competition, and re-coppicing or re-pollarding them to minimize the risk of mechanical failure. ‘Overmature’ stands, such as those in Lady Park Wood, also contribute to the stock of dead wood and veteran trees.

Several woods contain natural features that require special protection (section 5). The natural rock gardens on the Seven Sisters Rocks, the various caves and rock shelters, and the marsh and tufa deposits of the Dropping Well, for example, are small features that are vulnerable to excessive public access and habitat changes. Several woods support small populations of rare wild plant species, such as the white helleborine, spreading bellflower and martagon lily, and these need special consideration by managers.

Parts of some woods have been felled and will remain as permanent open spaces within the woods. Some are vistas, such as the Duchess Ride in Cuckoo Wood, and these may develop into short-rotation coppices. Others represent the first steps in heathland restoration. At Beacon Hill, Broad Meend and Tidenham Park, the Forestry Commission is removing mature conifer plantations, and will graze the regrowth with the aim of restoring the heather- and bilberry-dominated heaths that formerly grew there. Likewise, some of the birch scrub that has encroached onto Cleddon Bog and Staunton Meend has been removed.

The widespread tracks, rides and forest roads will be maintained as open, but sheltered, habitats that pervade all but the smallest woods. They not only facilitate access, but add greatly to woodland biodiversity. They are particularly important for the Haugh Wood butterflies, and there the whole ride system is managed for them. Elsewhere, rides are kept open, but diverse, by thinning on the margins, leaving a scatter of spreading broadleaves beside them, and planning forestry operations to avoid simultaneous mature stands on both sides. The grassland and tall herbs in the rides are mown at various frequencies to maintain diversity.

Some wild species should be controlled. If deer were to multiply unchecked, they would destroy sapling trees, eliminate some of the woodland ground flora species, and create a hazard on nearby roads. One response is to fence them out of sensitive woods, such as reserves and woods under regeneration, but this is unsightly for visitors, expensive, increases the browsing and grazing pressure on other woodland, and often does not work, since deer are remarkably quick to spot any weakness in a fence. Culling in sensitive woods does not work, for other deer quickly move into any uninhabited woods. Probably the best long-term approach is landscape-scale culling, which involves reducing the deer numbers substantially in a whole group of woods and the intervening farmland. The aim of present and future control is to reduce the damage to tolerable levels, but not to reduce deer to the point where they are rarely seen by visitors. Deer also represent a source of venison, which is available for sale in local shops.

Deer are beautiful animals, and culling them is a sad necessity. Much the same can be said of that other scourge of Wye Valley woods, the grey squirrel. Attempts at control have only ever been successful on a local scale, and in most of the Wye Valley woods its numbers are determined by weather conditions.
and food supply. As a result, two of the important native timber trees – beech and oak – cannot now be grown into the great trees that we inherited from the past. Research continues, and meanwhile the damage can be mitigated by minimizing the amount of thinning in maturing stands.

Management must also contend with widespread pollution and climate change. Solutions, if any, must be found in a wider context, but some precautionary measures can be taken locally. The increased loads of nitrogen can be partly offset if some is removed as timber, i.e., the response is more management, not less. The impacts of climate change are still uncertain. Beech may not survive climatic warming, but at present grey squirrels provide a far better reason for not trying to grow beech as timber, and in reserves, beech can safely be left to find its own level.

New woodland

In most parts of Britain, woods are so small and scattered, that their isolation from each other has impoverished their wildlife, and their small size makes them hardly worth managing for timber or anything else. The Wye Gorge and its surroundings, in contrast, have always been very well wooded by British standards, and it is the grasslands and other non-woodland habitats that are small and isolated. Additional woodland in this part of the AONB is usually unwelcome, for it is likely to replace rare habitats and obscure more views.

The same may be said about the Woolhope Dome, but elsewhere in the AONB north of Goodrich, the woods are generally isolated amongst farmland. Here there is a much stronger case for expanding woodland habitats by planting adjacent to small woods and growing wooded links between woods. Debates amongst ecologists and landscape designers about the most efficient pattern for linking woods are lively, but there is much to be said for concentrating new woodland along watercourses. Rivers and streams are the natural links in the landscape, and additional riparian woodland would fit well into the existing pattern of farmland trees.

On a larger scale, there is a case for planning wooded links to concentrations of woodland outside the AONB. In particular, additional woodland in the Coed Llyfos and Earlswood districts would improve links with Wentwood; and in the Herefordshire farmlands west of the Wye, supplementing the still-dense hedge network would improve links to the woodlands along the Monnow catchment and beyond.

Trees outside woodland

Trees and hedges in farmland and around houses contribute to the sum of woodland habitats. Bluebells, for example, are widespread in hedges and green lanes, dormice use hedges to move between woods, and veteran oaks and limes are commoner around fields than in woods. Moreover, many hedges were once the margins of woods, that were retained as field boundaries when the wood was cleared.

The AONB is fortunate to still have a good stock of hedges and field trees, but these will need to be perpetuated by ensuring that saplings are allowed to grow as eventual replacements for today’s mature trees, and by hedge management.

Conclusion

The Wye Valley AONB is less in need of additional woodland than any other AONB, but the woodlands that dominate its landscape, wildlife habitats and recreational resources need to be managed. After a divisive period during the 1970s and 1980s, when woods were either neglected or intensively managed for narrow objectives, much has since changed towards management for multiple objectives. The general need, as currently envisaged, is to continue and reinforce this transformation.
Notes, references and further reading


1.2. William Gilpin (1789), Observations on the river Wye and several parts of South Wales, &c. relative to picturesque beauty; made in the summer of the year 1770. 2nd edition. R.Blamire, London.


2.3. G. Peterken (2005), Development of the ancient woodland of the Lower Wye Valley. Archaeology in the Severn Estuary 18, 111-120.


2.5. Sites of Special Scientific Interest are scheduled under s.28 of the Wildlife and Countryside Act, 1981.

2.6. Special Area for Conservation have been listed in response to the European Union’s Habitats and Species Directive.


3.9. Details of 18th century coppice management can be found in management records (D2026) held in the Gloucester Record Office (Unpublished report for Woodland Trust by David Thomas).


3.13. One of the largest oak in Britain, the hulk is still impressive half-a-century after it died. A sapling oak grown from the original now grows on the spot near Newland.

4.1. An inventory of archaeological sites for Gloucestershire and Herefordshire is held by the County Council, as the Sites and Monuments Records; Bryan Walters (1992), The archaeology and history of Ancient Dean and the Wye Valley, Thornhill Press, Cheltenham. This section includes information and advice from Rebecca Roseff and Ian Standing.


5.1. An outline of the post-glacial history of woodland in the southern parts of the AONB can be gleaned from the numerous publications of the Severn Estuary Research Group.

5.2. See notes 2.4, 2.5


5.5. Trail Guides for Woolhope Dome, Symonds Yat and Wye Gorge by the Herefordshire and Worcestershire Earth Heritage Trust, Geological Records Centre, University College Worcester.

6.1. This section is summarised from a forthcoming volume on the Lower Wye Valley in the New Naturalist series by G.F.Peterken, in press with Harper Collins. The sources will be acknowledged in the book.

6.2. The Transactions of the Woolhope Naturalists’ Field Club for the 1860s and 1870s make interesting reading on the earliest fungal forays.


7.1. This section is based on discussions with, and information from, the staff of the Forestry Commission.

7.2. Information from David Lovelace.

7.3. Estimates from deer populations are completed annually by the AONB office.

7.4. Peterken and Mountford (2005), op.cit.


7.6. M.A. Sutton and others (2004), The role of trees in landscape planning to reduce the impacts of atmospheric ammonia deposition, In: Richard Smither (editor), Landscape ecology of trees and forests, IALE(UK) and Woodland Trust, pp.143-150.

7.7. From long-term observations on the pied flycatchers in the RSPB’s Nagshad reserve


8.2. Separate forestry strategies have been published for England and Wales. Regional Forestry Frameworks have been published for the South West and West Midlands.

8.3. Woodland Trust PAWS restoration booklet.


8.5. Veteran tree surveys area now in progress in parts of the AONB.
Acknowledgements

The text was written by George Peterken with the assistance of David Lovelace on some aspects relating to Herefordshire. It incorporates information supplied by the Forestry Commission, Natural England, the Countryside Council for Wales, the Woodland Trust and other organisations represented on the Woodland Management Group of the Wye Valley AONB. In particular, Forestry Commission staff discussed drafts of the final sections relating to trends, opportunities and options for management, and contributed to their development. Rebecca Roseff and Ian Standing helped with the archaeology section. Andrew Blake of the AONB Office wrote the specification and discussed the detail. The document thus seeks to represent the views and understandings of all these individuals and organisations.

The booklet was designed by Tony Eggar, with the guidance of Mark Bristow of the AONB office. The illustrations came from a variety of sources. David Lovelace supplied maps, records and photos relating to Herefordshire woodland and archaeology. Bird and mammal photos were by Ray Armstrong and Andy Purcell; butterfly photos by Peter Hugo; bryophyte photos by Jonathan Sleath; and the whitebeam photo by Tim Rich. The mountain biker photo was provided by Stockfile - Steven Behr. The aerial photographs came from the AONB office collection. Many shots of woodland and woodland management were supplied by the Ravine WoodLIFE Project from sources in the Woodland Trust, Countryside Council for Wales and the Forestry Commission. The majority of photos were supplied by George Peterken, supplemented by Tony Eggar. The print of Lover’s Leap is reproduced courtesy of Chepstow Museum; the print from William Gilpin’s book and the old Tintern postcard were supplied by George Peterken; and the prints from Cooke’s The Forest of Dean were supplied by Ian Standing.

Woodland Management

National and local policy and guidance on woodland management is regularly changing.

For advice on grant aid for woodlands and information on woodland management policy go to:

**The Forestry Commission**: Manages a raft of schemes under the banner of the English Woodlands Grants Scheme. [www.forestry.gov.uk/ewgs](http://www.forestry.gov.uk/ewgs) Advice line: 01223 346004

**The Forestry Commission Wales**: Manages the Better Woodlands for Wales grants scheme and Cydcoed grant funding for community woodland projects. [www.forestry.gov.uk](http://www.forestry.gov.uk) go to Wales.

**Royal Forestry Society**: Details Government, private and charitable sources of funding for woodlands and loans and business sponsorship. [www.rfs.org.uk](http://www.rfs.org.uk)

**Coed Cymru**: All Wales initiative to promote management of broadleaved woodlands and the use of hardwood timber products. [www.coedcymru.org.uk](http://www.coedcymru.org.uk) Tel: 01686 650777

**Woodland Trust**: Campaigning woodland charity with advice on woodland management. [www.woodland-trust.org.uk](http://www.woodland-trust.org.uk)

Coed Cadw is its Welsh organisation: [www.coed-cadw.org.uk](http://www.coed-cadw.org.uk)

**Small Woods Association**: Publishes advice on management and marketing of small woodlands. [www.smallwoods.org.uk](http://www.smallwoods.org.uk). Tel: 01743 792644

**Ravine WoodLIFE**: European Community and partnership funded project working to restore woodlands in the Peak District and Wye Valley. [www.ravinewoodlife.org.uk](http://www.ravinewoodlife.org.uk)

The Wye Valley AONB Unit’s strategy on woodlands, trees and forestry is contained within its Management Plan 2004-2009 available from [www.wyevalleyaonb.org.uk](http://www.wyevalleyaonb.org.uk)