

HA1: Woodland

Definition

This audit includes all semi-natural plant communities dominated by trees or shrubs. Although there are a few intermediate habitats, the dominance of woody species generally distinguishes woodland and scrub from grasslands and marshes. London's better woodlands have been described before^a, but this audit can take account of more recent information on both the woodlands and their community types, provide borough by borough statistics and identify the issues that will need to be addressed in action for London's woodlands and scrub.

Most of London's woodland and scrub types can be found on railway linesides and in cemeteries, if not churchyards. While the statistics for these places are included in this audit, they are covered also in separate statements (HA 14 & 13 respectively) because of their special land use.

Heathland is included in a separate audit; it is distinguished from gorse scrub by the presence of heather or dwarf gorse, rather than just common gorse. Hedgerows are also included in a separate audit because of their unique structural rôle, although the better hedgerows all fall within the hawthorn and blackthorn scrub communities.

Some of the beech and hornbeam woodlands of north London were once wood pasture, with widely spaced pollarded trees, but most have been neglected for so long that they are now woodland and are included within this audit.

The various woodland community types of London are given in Table 1. Particular combinations of plant species distinguish them. The table arranges these by the two factors that have most influence on their composition. The columns group together woodland types according to their soil reaction. On the left are chalk and other base-rich soils, and on the right the sandy, stony and peaty acidic soils. The rows group together communities according to how well drained they are, and their successional stage. In the bottom two rows are the scrub communities dominated by hawthorn, gorse or bramble which, if left alone, will change by the slow natural process of 'succession' into woodlands. To the top are the well-drained woodland communities with yew and beech; in the middle are the wet communities with alder and willow. In between are the moist, but not waterlogged, woodlands with oak, ash, hornbeam, sycamore and field maple.

Although the table includes a large number of woodland and scrub communities that may occur in London, the next section of this audit shows most of them to be uncommon or rare.

London's Woodland Resource

The best statistics for London's woodland and scrub cover come from the London Wildlife Habitat Survey of 1984/85, held by the London Ecology Unit. While these statistics are known to be slight underestimates, and there will have been minor changes over the years since the survey, the errors should not be large as they result mainly from the exclusion of a number of very small blocks of woodland and scrub. The most significant exclusions were of the smaller areas on London's railsides and hedgerows distant from other valuable habitat. The majority of the area is found in large blocks that were all documented in the survey and almost all of which have not changed since the survey.

Table 1: Woodland Community Types in London

Drainage & Form	Characteristic species	Soil Reaction		
		Base rich ('chalk')	Neutral	Acid ('sandy')
Free-draining	Yew	Yew		
	Beech	Beech Hangers	Beech-bramble	Acid beech
Moist	Oak, ash, hornbeam, sycamore, maple	Ash-maple-sycamore	Oak-honeysuckle-hornbeam-sweet chestnut	Birch-oak
Wet	Willow	Nettle	Fen Carr	Grey willow carr Birch-purple moor grass
	Alder	Nettle & Alder flush	Swamp carr	
Scrub	Hawthorn & gorse	Hawthorn & blackthorn	Hawthorn & blackthorn	Gorse
	Bramble		Bramble-Yorkshire fog	Bracken-bramble

The following table illustrates the range of woodland and scrub plant community types found in London and Appendix 2 considers each in detail.

Table 2: Woodland and scrub in London (ha)

Borough	Native woodland	Non-native	Coniferous	Fen carr	Scrub
Barking & Dagenham	5.7	0.9	0.0	0.4	28.0
Barnet	277.6	66.3	8.3	-	126.0
Bexley	104.0	119.4	14.7	0.2	59.0
Brent	19.0	5.4	0.0	-	31.9
Bromley	1424.8	302.6	63.4	0.8	139.7
Camden	116.2	18.3	1.1	-	2.5
City Of London	-	-	-	-	0.2
Croydon	638.7	62.0	36.9	-	166.7
Ealing	69.8	11.1	0.6	-	64.6
Enfield	372.0	17.3	17.7	0.3	62.2
Greenwich	218.1	53.7	0.4	-	73.3
Hackney	6.3	9.8	-	0.2	1.4
Hammersmith & Fulham	1.0	8.0	-	-	8.5
Haringey	77.9	18.3	0.4	-	8.2
Harrow	218.5	25.2	8.8	1.3	51.5
Havering	307.5	55.7	0.3	10.5	122.4
Hillingdon	614.1	42.6	0.9	2.6	156.4
Hounslow	76.8	24.1	2.1	-	98.4
Islington	1.7	1.7	-	-	1.5
Kensington & Chelsea	3.9	11.1	-	-	3.3
Kingston	95.5	17.8	2.1	-	25.5
Lambeth	17.1	17.5	-	-	14.2

Borough	Native woodland	Non-native	Coniferous	Fen carr	Scrub
Lewisham	42.9	40.5	0.6	-	19.3
Merton	142.5	8.1	-	-	62.0
Newham	2.7	5.0	-	-	33.0
Redbridge	158.4	41.9	-	-	78.9
Richmond	396.2	78.0	0.9	-	35.2
Southwark	47.7	34.4	0.0	-	11.6
Sutton	36.5	57.0	2.6	-	42.8
Tower Hamlets	3.0	4.1	-	-	7.3
Waltham Forest	228.2	9.2	0.8	-	28.5
Wandsworth	169.4	37.2	-	-	14.4
Westminster	2.6	3.8	-	-	0.4
London Total (ha)	5896	1208	163	16	1579
% London land area	3.7	0.8	0.1	0.01	1.0

The 7,300 ha (4.5% of Greater London's land area) of woodland documented in the Wildlife Habitat Survey is known to be a good estimate of the total^b. Woodland is the second most extensive natural habitat of London (after unimproved and semi-improved neutral grassland). Much of the woodland (5,900 ha or 3.7% of London) is native broadleaved woodland. There are some 1200 ha of non-native broadleaved woodland (predominantly sycamore, 0.8% of London) and small amounts of coniferous woodland (160 ha not native to the London area, 0.1% of London) and fen carr (16 ha, 0.01% of London). The area of scrub in London is some 1,600 ha (1% of London). This last figure is likely to be a less accurate estimate than the woodland figures, given the smaller size of most patches of scrub.

Figures 1, 2 and 3 give the distribution of native woodland, non-native broadleaved woodland and scrub from the Habitat Survey. These Figures are also presented as simpler maps, with the total amount of habitat in each borough represented by a dot of proportional size. There is a good correlation between the amounts of all four habitat types across London Boroughs, showing that a borough with much native broadleaved woodland tends also to have more non-native and coniferous woodland and much scrub.

Figure 1 shows that native woodlands are numerous and scattered over Greater London, so that few areas are further than two kilometres from a woodland. Good concentrations of woodland occur in the north of Hillingdon, at Hampstead Heath, Wimbledon Common and Richmond Park, Epping Forest, the north of Redbridge, Oxleas, Dulwich (remnants of the 'Great North Wood') and especially in the south of Croydon and throughout Bromley. Most of these concentrations are on high ground. There is a dearth of woodland in central London and on the low-lying land east of there and north of the Thames, and a similar void west of the Lea Valley. These areas are predominantly low ground and were easily worked for agriculture.

Figure 2 shows that the distribution of non-native broadleaved woodland, although still predominantly on higher less easily worked ground, is not so concentrated, so helping to fill the gaps in the distribution of the native woodland. Almost all the areas are small (less than 20 ha), with the notable exception of the sweet chestnut woodland of Lesnes Abbey Wood in northern Bexley.

Figure 3 shows that the very many small areas of scrub are even more widely scattered. Although they occur with the woodland, there are also concentrations in the river valleys of the lower Thames, Lea, Brent and Colne and a notable concentration at Mitcham Common.

The London Ecology Unit holds the parcel-by-parcel details of all the woody habitat summarised in Table 1 (and for many boroughs a more detailed re-survey). The most recent data should be the starting point for an individual borough audit.

When the Habitat Survey was undertaken the best classification of woodland types was that of Peterken^c, which largely employs the woody species. Since then the National Vegetation Classification, which is the basis for the communities in Table 1 and takes all plants into account, has been published, but much of the survey material for London pre-dates this time and presents difficulties in determining the NVC community types.

For this audit, the information on London's best woodlands, those included within a Site of Metropolitan Importance for nature conservation^d, was reviewed and the best approximation to the NVC types determined. The woodland in these sites totals 3,200 ha, nearly half of London's woodland, and so is a good sample, if biased towards the older and larger woods. This analysis is not yet complete, so that the following paragraphs will be subject to revision. Figure 4 shows the amount of each type in the Metropolitan Sites and Appendix 1 gives the data on which this is based.

Three woodland types comprise the majority of London's woodlands. The largest single category is the woods of moist neutral soils, the oak-honeysuckle-hornbeam-sweet chestnut woods. This type is found in most of the woodland Sites of Metropolitan Importance, except for some of those on chalk, Southeast of London. Within this category is the sweet chestnut woodland of Lesnes Abbey Wood and most of the hornbeam woodlands of Ruislip, Epping Forest and Hainault Forest. The hornbeam woodlands are distinctive of London and the nearby area of the Southeast.

The second largest category is the ash-maple-sycamore woodlands, and these are even more widespread in the Metropolitan Sites than the oak-honeysuckle woods. The older stands of these woodlands on the chalk in Croydon and Bromley can have a rich flora, but many of the recent secondary sycamore woodlands are botanically poor.

The third category is the oak-birch woodlands of acid soils. These tend to be on the old heaths and commons, such as Wimbledon Common, Epping Forest and Hampstead Heath and in other places on sandy and gravelly soil, such as on top of Croham Hurst, at Petts Wood, Ruislip woodlands and Lesnes Abbey Woods.

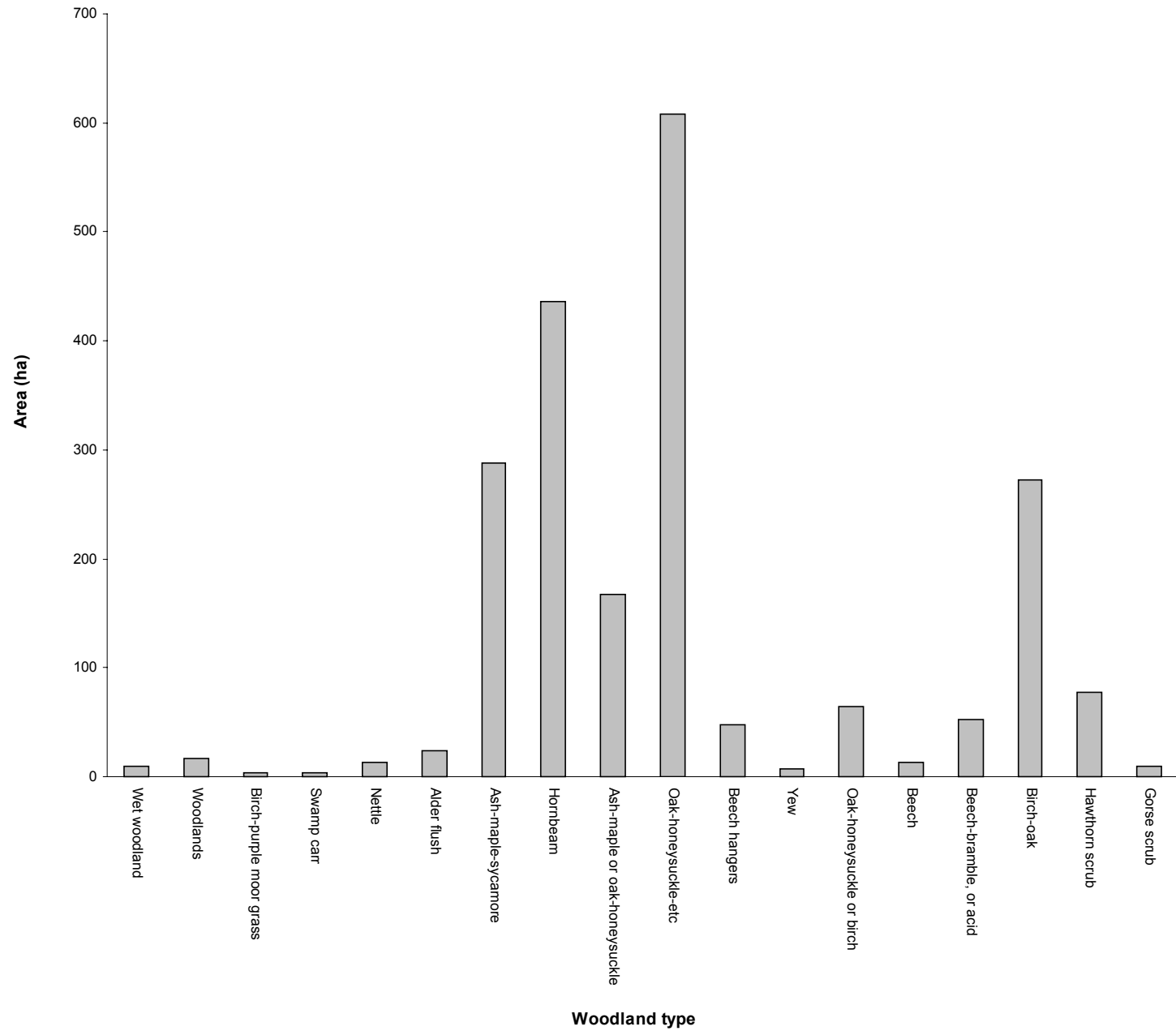
Hawthorn scrub is the next largest type, found in a wide range of sites, but especially in the Farthing Downs site in Croydon and in Epping Forest. The Metropolitan sites probably underestimate the amount of this habitat in comparison with the woodlands.

The beech woodlands come next in order of abundance. Many of these were difficult to classify by type, but there are certainly beech hangers on the chalk in Croydon and Bromley, which is where most of these three types are found. The beech woods of north London are beech-bramble and acid beech types.

There is very little yew woodland in London, Cudham Frith in Bromley having a small area on a steep chalk scarp and there just may be a small area also in the West Kent Golf Course Woods.

Wet woodlands in London are many, but small and scattered. The largest areas are found in the mid-Colne Valley and Ingrebourne Valley. The most widespread type is probably nettle woodland, but there is not much of this species-poor type in the Metropolitan Sites. Another species poor type, grey willow carr, occurs in and around old gravel workings in both valleys. There is a small area of swamp carr at Bewick Ponds on the Ingrebourne and small areas of Alder flush woodland where springs and flushes occur elsewhere in London's woodlands, as at Petts Wood. Birch-purple moor-grass woodland occurs on the plateau of Wimbledon Common.

Figure 4: The amount of different woodland types in London's Sites of Metropolitan Importance (incomplete analysis July 99)



Gorse scrub occurs on the old commons, such as Mitcham Common, Wimbledon Common and on other acid soils, such as at Epping and Hainault Forests and the Ruislip Woods.

Nature Conservation Importance

There is no doubt that London was very largely clothed in woodland before the activities of man induced the other ancient habitats. Even nowadays, after millennia of management, the composition of the ground flora of the older woodlands is derived from this wildwood. But there have been many losses, and the composition of woodland canopies more reflects their long history of management, so that species like hornbeam, sweet chestnut, field maple and hazel are more abundant than they would be naturally.

The value of ancient woodland^c for nature conservation has long been recognised. The correlation between ancient status and nature conservation value in London is good. Most of the larger ancient woodlands in London are included in Sites of Metropolitan Importance and there are not many parts of the Metropolitan Sites that are not ancient. However, the correlation is not absolute, so it would be dangerous to assume that all valuable woodlands are ancient or that all ancient woodlands are valuable^f. This audit considers survey data from woodlands in London and so enables a better evaluation than the simple two-way classification into ancient or not.

For plant community conservation, hornbeam woodlands must be important, given that London is in the centre of their restricted national distribution. The larger areas of these woodlands also support some uncommon species in London, such as the hawfinch, marsh tit and spotted flycatcher.

National priorities that should be considered in London are for wet woodlands^g and beech yew woodlands^h. The national action plan considers wet woodlands important for the conservation of bryophytes, invertebratesⁱ and the otter. In London their rarity should give them importance.

The national plan for beech and yew woodlands lists several rare species, some of which are found in the London examples. Coral-root bittercress occurs in Old Park wood on the chalk in northwest Hillingdon and bird's nest orchid is found in the deep shade of some of the beech hangers in Bromley, and there are records of violet helleborine from the beech woods across London's northern fringes. The national plan also identifies two priority fungi and a moss^j.

There is a valuable mosaic of chalk scrub, woodland and grassland on some sites in the south of London (such as Farthing Down), which not only holds many uncommon plant species, but provides a wide range of resources for uncommon animals.

The scrub and woodlands of moist soils are not included in national priorities, but they must be considered important in London, as they provide the majority of our valued woody cover. Woodlands like Oxleas, the National Nature Reserve Ruislip Woodlands, Lesnes Abbey Wood, Dulwich and Sydenham Hill Woods, Petts Wood and 60 Acre Wood are all on these soils. These soils, too, support almost all of the secondary woodland that plays a vital strategic rôle in areas otherwise deficient in woodland. These places help to sustain a wide variety of animal species that provide the everyday biodiversity for Londoners to enjoy, including birds like the nuthatch, woodpeckers, leaf warblers, tree creeper and bullfinch.

The scrub of London's railsides, commons and wastelands also plays a valuable role, providing nectar for butterflies and sustaining birds like the wren and dunnock, as well as less widespread species like whitethroats and linnets.

Most of the birds appreciated in the back gardens of suburban London are those of woodland and woodland edge: the tits, robin, chaffinch, dunnock, wren, greenfinch, song thrush and

even the blackbird. Garden invertebrates with a similar ecology include the holly blue and speckled wood butterflies. Even the stumps of dead trees support the stag beetle. It is the woody vegetation of gardens that helps to sustain London's populations of such species, so there is a strong link between London's scrub and woodlands and the everyday biodiversity conserved in gardens.

Some woodland and scrub sites of nature conservation value in Greater London

Bostall Woods and Heath, LB Greenwich
Denham Lock Wood, LB Hillingdon
Downe Bank and High Elms, LB Bromley
Ken and North Woods, LB Camden
Lesnes Abbey Wood, LB Bexley
Perivale Wood, LB Ealing
Ruislip Woods, LB Hillingdon
Sydenham Hill Wood, LB Southwark
Wimbledon Common, LB Merton and LB Wandsworth

Threats and Opportunities

Threats

All the woodland types are threatened with clearance to make way for other uses. Many are also damaged by management for amenity, or overuse by people and their pets. The old woodlands with rare plant species require a continuation of traditional management and protection from other disturbing influences, but it should be appreciated that the value of recent secondary woodland tends to be more as habitat for animals and that traditional management may not be appropriate for this purpose. Indeed woodland, as the 'climax' vegetation of London, requires no management to ensure its future.

Many wet woodlands have a dense structure, often with fallen trees, difficult ground conditions and mosquitoes. This makes them more difficult to enjoy and so less appreciated by the public than 'bluebell woods'. They are threatened with changes in the water regime through drainage or flood control work, succession to drier habitats and toxic water pollutants. The tradition of pond maintenance to arrest succession to wet woodland prevents the development of many small wet woodlands.

Opportunities

There has been a national drive for woodland planting, manifest in and around London in the Watling and Thames Chase projects. The aims of these projects extend far beyond biodiversity conservation, but they provide an excellent basis for the development of new woodlands for people to enjoy. The framework of Table 1 and Appendix 2 should provide a good basis for what it is sensible to create according to soil conditions. There are also less obvious opportunities, such as allowing wetlands to develop into wet woodland through natural succession, which would be appropriate in disused mineral workings.

Tree planting can, however, cause harm to nature conservation, as trees shade out other valuable plant communities in grassland, heath or marsh. It is vital therefore that new woodland planting is undertaken only after survey of the existing plant community confirms that it is of no special value for nature conservation.

The greatest need for new woodlands and scrub is in the heavily developed low land and inner boroughs of London, but it is there that space is at a premium. In such areas the natural succession to woodland that occurs on abandoned land or in the old cemeteries is a gift of woody vegetation that must be accepted. Such places provide some of the only woodlands in wide areas of London and a significantly better habitat than is available in ordinary amenity planting.

Where there is space in a wetland, allowing succession to wet woodland will provide a valuable habitat. Rather than reverse the succession in a pond, if there is room, it is preferable to create a new pond and allow the old one to become wet woodland.

Appendix 2

London's Woodland and Scrub Communities

1 Introduction

This report is based upon the National Vegetation Classification (NVC)^k, which provides general descriptions of the floristics of woodland and scrub plant communities occurring in London. Our operational definitions of woodland and scrub are the NVC communities included within volume 1 of the NVC^a. The NVC descriptions are confirmed by the audit of data from London in the following sections of this report. The NVC sampled few woods in London^l, but the areas around London were well-sampled. This means that most of the more widespread and interesting woodland types of London are described adequately by the NVC, but there are problems with woodlands of recent origin on typically urban sites.

Climate is probably the largest natural influence on London's woodlands, as London lies near the extreme of three national trends:

- Decrease in rainfall and humidity towards the southeast of England,
- Increase in average temperatures towards the south of England, and
- Greater extremes of temperature in the inland east of England. Winter temperatures are ameliorated somewhat by the urban 'heat island' effect.

In combination, these climatic effects lead to several woodland species being concentrated in the lowland south or east of the UK. Among the canopy species these are: hornbeam, field maple, beech, yew and small-leaved lime. Shrubs include: buckthorn, wayfaring-tree, spindle and dogwood, and in the ground flora we find wood spurge, yellow archangel, early dog-violet and Lords-and-Ladies.

These have been listed in approximate order of decreasing concentration in and around London, but there is no single species that is widespread in London and not elsewhere; even hornbeam is widespread as a native tree in the counties adjoining London to the north, south and east.

Past coppice management has favoured species such as ash, field maple, hornbeam, beech, sweet chestnut and hazel over oak, birch, elm, rowan, holly and sycamore. In this regard many of London's recent secondary woodlands may have a more natural canopy than those with a history of traditional management.

Many of London's larger woodlands are accessible to the public and so have suffered from trampling, eutrophication and the clearance of the shrub layer to improve sightlines. In the extreme these woodlands have been degraded to mown grasslands with bare pathways and scattered trees. Conversely, many of the smaller woodlands are of recent origin through ecological succession on inaccessible land and suffer no such problems.

Finally, the absence of significant grazing and browsing in many of London's woodlands has favoured species such as holly and ivy.

2 The amount and distribution of woodland and scrub types in London.

The classification in the table below is designed to provide somewhat more friendly labels for the NVC woodland and scrub communities of London than those of the NVC itself.

Table 3: Simplified classification of London’s woodland and scrub types.

Characteristic species	Soil Reaction		
	Base rich ('chalk')	Neutral	Acid ('sandy')
Yew	Yew (W13)		
Beech	Beech hangers (W12)	Beech-bramble (W14)	Acid beech (W15)
Oak, Ash, Hornbeam Maple & Sycamore	Ash-maple-sycamore (W8)	Oak-honeysuckle hornbeam-sweet chestnut (W10)	Birch-oak (W16)
Willow	Alder nettle (W6)	Fen carr (W2)	Grey willow carr (W1), Birch-purple moor-grass (W4)
Alder	Alder nettle (W6)	Swamp carr (W5)	Alder flush (W7)
Hawthorn & gorse scrub	Hawthorn hedge & scrub (W21), Blackthorn (W22b)	(W21), (W22b)	Gorse (W23a)
Bramble scrub		Bramble-Yorkshire fog (W24)	Bracken-bramble (W25)

In Table 3, the columns summarise the soil types on which the communities are found. The base rich soils (rendzinas and brown calcareous earths) in London occur on the chalk, but also on Boulder Clay and on the London Clay in places. The more neutral soils (brown earths of low base status) occur widely on the clays, and on the recent sands, gravels and alluvium. The acid soils (rankers, brown podsollic soils and podsols) occur on the older leached sands and gravels. The rows relate mainly to drainage and soil development, but also to succession in the case of scrub. At one extreme, the yew woodlands are on steep, thin soils over chalk, and at the other, the willow and alder woodlands have a permanently wet or water-logged soil. Beech tends to occur on better drained soils than do oak, ash and maple, although some regard beech woodland as a later successional stage to the other three trees, even in moister soils.

The NVC does not place London’s hornbeam-dominated woodlands, into one community. Despite their ground flora being generally poor, they are seen as the product of historic management of ash-maple and oak-honeysuckle woods, but largely the latter. The many sycamore-dominated, recent, secondary woodlands in London span a wide range of soil types, but are mainly on the soils that would otherwise have ash-maple woodland.

The amount of each woodland and scrub type in London is summarised in Figure 1, to which the following accounts refer. More detailed information is given in Table 1, which gives the approximate amount of each type in each of the woodlands included within London’s Sites of Metropolitan Importance^m for nature conservation. There are about 7300 ha of woodland in London, a half of which is included within Sites of Metropolitan Importance for nature conservation. The distribution of this across the boroughs is given in Table 2.

Much of the information used to determine the community types in these woodlands was collected before the NVC methodology was available precluding many precise identifications of the communities, and some well-described woods did not appear to fit the classification very well. For these reasons some broad categories were employed, ranging from woodlands where no sensible community identification could be made, to some which appeared to be a mosaic of two or more types, or to fall between their communities.

- 2.1 ***Oak-honeysuckle (hornbeam, sweet chestnut) woodland*** (NVC W10). This woodland type is found on soils that are moist and of mid range pH, and is defined more for the lack of species indicative of drier, wetter, more acid, or more basic conditions, than for any particular preferential species. It is probably the most widespread woodland community in London's Sites of Metropolitan Importance, if one accepts that many of the unattributed hornbeam and some of the sycamore woodlands probably belong here, and almost certainly the commonest type in London. Typical trees are pedunculate oak and silver birch, while ash and maple are scarce. The best bluebell woods occur here, but moister soils have wood anemone instead, and creeping soft-grass, bracken and bramble are common. Most sweet chestnut woods belong here, as do many hazel coppices. The NVC describes five sub-communities, four of which appear to occur in London (W10e being the exception). We have identified this type provisionally in all of the Metropolitan sites except for some on the chalk in the south-east and on the fertile alluvium of the Colne Valley.
- 2.2 ***Ash-maple (sycamore) woodland*** (NVC W8). This woodland type is found on soils that are moist and base-rich. It has a very wide range of species and is one of the richest of London's woodland communities. It is the second commonest type in the Sites of Metropolitan Importance. Indicative species include field maple and ash, but also sycamore, elm, buckthorn, guelder rose, dog's mercury, wood sage, ramsons, lesser celandine and primrose. It shares pedunculate oak, birch, hawthorn, hazel, bramble, bluebell, wood anemone and ivy with oak-honeysuckle woods. Some of London's hornbeam woodlands belong here. Seven sub-communities are described all but two of which (W8f & g) occur in London. We have provisionally identified this community in almost all of London's Metropolitan sites. Most of the sycamore woodland in London should be classified here.
- 2.3 ***Birch-oak woodland*** (NVC W16a). This type is found on acid and nutrient-poor soils, usually as the result of succession on previously heathland or acid grassland sites, where the displaced habitat is often preferred. It is the third most abundant type in the Sites of Metropolitan Importance. The dominant trees are commonly pedunculate oak and silver birch, but sessile oak and downy birch may be dominant. Ash, hazel, sycamore, hawthorn and bluebells are uncommon and any bramble and honeysuckle sparse. Both Scots pine and sweet chestnut can occur in this type. It is species-poor and has few indicative species, but the presence of much heather, wavy hair-grass, purple moor-grass, rowan, gorse or bilberry distinguishes it from oak-honeysuckle woodland. Holly is prominent in the understorey of some stands. It shares bracken with oak-honeysuckle woodland. This woodland has few spring flowers, although lily-of-the-valley can occur. Two sub-communities are described, but just this one occurs in London.
- 2.4 ***Beech hangers*** (NVC W12). This type is the most abundant beech wood in the Sites of Metropolitan Importance, and is found mainly on the well-drained chalk in the south and east of London. It grows in similar places to ash-maple woodland, which it may replace through succession until beech becomes the sole dominant canopy tree. However, the beech tends to be on the steeper scarps and the ash-maple on the lower slopes. Few other trees occur, but there may be some ash, yew, silver birch, holly and whitebeam. The heavy shade and root competition from the beech restrict the diversity of ash-maple woodland species, all of which can occur in small quantities. Only dog's mercury, sanicle, ivy, bramble, and wall lettuce occur in any abundance where the beech canopy is mature. Characteristic species are yew, wall lettuce and sanicle. Three sub-communities are described and all occur in London.
- 2.5 ***Yew woodland***. (NVC W13). This type is rare (or absent) in London. It is found on dry and exposed chalk. It is a more extreme type than the beech hangers and, like them, few other species survive under the heavy shade.
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- 2.6 ***Beech-bramble woodland***. (NVC W14). This is the beech dominated equivalent of the oak-honeysuckle woodland and, like it, is distinguished from related woodlands more by what it lacks than by any characteristic species. This community probably follows oak-honeysuckle woodlands in succession on better-drained sites. It proved difficult to identify in the London data, and there appears to be little of it in the Sites of Metropolitan Importance. However, if it was grouped with beech hangers or acid beech into one survey parcel, it could easily be overlooked. Pedunculate oak and silver birch are the only other frequent trees and, where there is little browsing, holly commonly forms a sub-canopy beneath the beech. The other species of oak-honeysuckle woodland are largely excluded by the heavy shade and root competition of the dominant beech. Bramble carpets the ground in the older stands, with a little bracken and honeysuckle. There are no recognised sub-communities.
- 2.7 ***Acid beech woodland***. (NVC W15). This is the beech dominated equivalent of the birch-oak woodland. It often has large amounts of the dominant species of the latter, pedunculate oak and silver birch, and of Scots pine. Also it often has much holly, some rowan and a scattering of bracken and wavy hair-grass. It might be better considered a sub-community of birch-oak woodland. Characteristic species include pill sedge, bilberry, heather, holly and more rarely common cow-wheat and wood sorrel. None of this community was positively identified within the Sites of Metropolitan Importance but, as with the previous community, it could have been subsumed into beech hangers, or in this case, into birch-oak woodland. Four sub-communities are described and all could occur in London.
- 2.8 ***Alder nettle woodland*** (NVC W6). This species-poor wet woodland type is probably the most widespread wet woodland community in London. It occurs mainly beside rivers and lakes where nutrient levels are maintained by periodic flooding. It is distinguished mainly by the abundance of nettle and scarcity or absence of species like common reed, lesser pond sedge, wild angelica, meadowsweet, purple loosestrife, common loosestrife, hemp agrimony, marsh marigold and common valerian. Usually it has a canopy of alder, but it may have crack willow, downy birch, osier willows or grey willow, and a little oak, ash or sycamore. The shrub layer may have grey willow, bramble, honeysuckle and elder. With the nettle may be cleavers, reed canary-grass, great willowherb, yellow iris, hedge bindweed and broad-buckler fern.
- 2.9 ***Swamp carr***. (NVC W5). This species-rich wet woodland comes about through succession in reedbeds and sedge fens. In the young stages it has much grey willow as well as alder, but the alder predominates later. There may also be a few ash, oak, downy birch, alder buckthorn, guelder rose and hawthorn. Bramble is the only frequent shrub, but there may be some honeysuckle. Reed eventually becomes shaded out by the tree canopy but lesser pond-sedge can survive under the mature canopy. Other fen species in this community include nettle, meadowsweet, common valerian, common marsh-bedstraw and water mint. This community is very likely to occur in London, but was not confidently identified in the Metropolitan Sites data. Characteristic species include lesser pond-sedge, remote sedge, marsh thistle, opposite-leaved golden saxifrage, hemp agrimony, alder buckthorn, yellow iris, gypsywort, purple loosestrife and bittersweet. Three sub-communities are described and two could occur in London.
- 2.10 ***Fen carr*** (NVC W2). This community too can be the result of succession in a fen community, but it can also result from the cessation of mowing of a marsh. Its national distribution is concentrated in East Anglia and the West Midlands and it may not occur in London. It is distinguished from alder carr by the infrequency of reed and frequency of bulky sedges, downy birch, grey willow and of sphagnum species in one sub-community.
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- 2.11 **Flush alder wood** (NVC W7). This alder dominated woodland typically occurs on slope flushes within oak woodland types in north-west Britain and the Weald. It may occur in London. It is distinguished from swamp and fen carrs by the scarcity of sedges and other fen species. It may have nettle on the ground, but is distinguished from the nettle woodland by having more yellow pimpernel, meadowsweet, lady fern, remote sedge, grasses and creeping buttercup.
- 2.12 **Grey willow carr** (NVC W1). This species-poor woodland is dominated very largely by grey willow and marsh bedstraw is usually found in its ground layer. It is found on mineral soils around lowland water bodies and probably occurs in London. There may be a few trees of other wetland species, or hawthorns and brambles, and grasses, bittersweet, ivy, water mint and soft rush below, but sedges and tall grasses are generally absent.
- 2.13 **Birch-purple moor-grass** (NVC W4). This is a simple community of wet acid soils, usually dominated by downy birch. It may have some alder, silver birch and a little oak, but no ash. The understorey may have willows, especially grey willow. Beneath this is largely purple moor-grass, usually with some sphagnum. Different subcommunities may have bramble, honeysuckle, broad buckler fern, Yorkshire fog, tufted hair-grass, creeping soft grass, soft rush and heather. Probably all three subcommunities occur in London in association with heathland and mire.
- 2.14 **Hawthorn hedge & scrub** (NVC W21). The majority of London's scrub, woodland edge and hedgerows fall within this single community type, characterised by much hawthorn and bramble, some blackthorn and dog rose and, in London, by cherry plum and plum. Ivy and young trees of ash and sycamore are common. It is regarded as a successional stage to the oak, ash, sycamore, hornbeam and maple woodlands, except where management arrests succession (as in hedgerows). The **chalk scrub** subcommunity (NVC W21d) is found on dry, base rich soils, and may include much dogwood, wayfaring tree, roses, yew, elder, privet, black bryony and old-man's beard, wood false-brome beneath, and trees from the base-rich woodland types. Several orchids can occur in this scrub type and it often occurs in a mosaic with chalk grasslands. A poorer subcommunity of these soils, **wood false-brome scrub** (NVC W21c) is more common in the north of Britain, but may describe chalk scrub in places where colonisation by a variety of species is difficult because of isolation from sources. This community often has wild strawberry and common dog-violet. The **ash-elm** subcommunity (NVC W21b) is found on heavier basic soils and is the scrub equivalent of ash-maple woodland, sharing with it many trees, shrubs and ground flora. It may also succeed the other subcommunities as the scrub canopy closes. Much of London's suckering elm scrub falls here and other characteristic trees include field maple. On made ground and abandoned agriculture the **elder-buddleia** subcommunity (NVC W21a) is widespread in London and it covers such a range of composition that the NVC subcommunity probably should be further subdivided, it typically has much nettle and cleavers beneath and a good variety of other herbs, such as red dead-nettle, common chickweed, creeping thistle, lesser burdock, hogweed, hedge bindweed, false oat-grass, Yorkshire fog, couch, squirrel-tail fescue, hawkweed oxtongue, sterile brome and other wasteland species. On chalky rubble this community borders on pure buddleia scrub. On less extreme basic soils succession to ash-maple woodland occurs and on more mesotrophic soils succession is to oak-honeysuckle woodland. All the subcommunities may be found on London's railsides.
- 2.15 **Blackthorn scrub** (NVC 22b). This scrub community is typically dominated by blackthorn, but otherwise parallels the hawthorn hedge and scrub community. The dense canopy of blackthorn makes this community generally poorer in species compared with the hawthorn community. It is widespread on London's railsides.
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- 2.16 **Gorse scrub** (NVC W23a). This scrub community is found on base-poor free-draining soils. Apart from common gorse, it may have broom and much bramble, young birch and oak. Very little grows on the ground below the gorse, but the community commonly occurs in a mosaic with grasslands having common bent and heath bedstraw. It occurs where the more acid woodlands have been felled, on woodland edges, or in succession to acid woodlands, but not in hedgerows. It is common where London's railsides pass through appropriate soils. Where there are appreciable amounts of heather or dwarf gorse the community is included in the heathland audit.
- 2.17 **Bramble-Yorkshire fog scrub** (NVC W24). This scrub type has elements of mesotrophic ('neutral') grassland and occurs on moist soils where woodland has been cleared, on rides and woodland edges or where bramble has invaded neutral grassland. Other common grasses are cock's-foot, red fescue and false oat-grass. There are often patches of nettle, hogweed, cow parsley, creeping thistle, spear thistle and rosebay willowherb. Underneath the bramble canopy are ivy and a scattering of woodland herbs. There are few or no other shrubs. The community is widespread on London's railsides and as a successional stage following garden use or wasteland.
- 2.18 **Bracken-Bramble scrub** (NVC W25). This is the equivalent of bramble-Yorkshire fog scrub on base poor freely draining soils. As there, this community has few or no other shrubs and few other associates, and occurs where woodland has been cleared, on rides and woodland edges or where bramble and bracken have invaded base poor grassland. It too is found on abandoned sites and on railsides where the soil is suitable.

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^a Dr M. Game in Chapter 3 of the Greater London Council Ecology Handbook No.4, *A Nature Conservation Strategy for London: Woodland, Wasteland, the Tidal Thames and two London Boroughs*.

^b The Institute of Terrestrial Ecology Land Cover Map of Great Britain (cited in *Focus on London 99*, Eds. Matheson, J. & Holding, A. 1999. The Stationery Office, London) found 8,000 ha of deciduous woodland in London by classifying each one kilometre square in the London area according to its majority habitat. These statistics will be biased high by the inclusion of all one kilometre squares that overlap London's boundary (whereas on average half of these are not in London), and biased low by the omission of many smaller woodlands that do not make up the majority of a one kilometre square. Given this, the coincidence with the Habitat Survey minimum figure of 7,100 ha of deciduous woodland is remarkably good. The statistics from a survey undertaken for *Task Force Trees* and published by the Countryside Commission (CCP 433, *Action for London's Trees, Investing in a leafy Capital*, 1993), however, are badly misleading, as 'stands' of trees (woodlands, orchards, etc.) were counted, but not otherwise documented and most of the statistics relate to individual trees standing as specimens in the open, not in a woodland community. The counts thus omit most of London's trees - those in woodlands. Unfortunately others (including some individual borough councils and London Planning Advisory Committee's *State of the Environment Report for London*) have taken the *Task Force Trees* statistics to be complete. The 4.5% woodland cover from the Habitat Survey compares with estimates by Dawson, D.G. & Warrell, A. 1992. *The amount of each kind of ground cover in Greater London*. London Ecology Unit 1992, which included woodland in three heterogeneous categories (golf courses 3.2%, nature conservation areas 2.4% and railway verges 1.0%) as well as woodland itself 1.9%. The different classifications of the two studies make comparison difficult, but the order of size appears about right.

^c Peterken, G. 1981. *Woodland Conservation and Management*. Chapman & Hall, London.

^d The non-statutory hierarchy of sites for protection in planning is described in *Policy, criteria and procedures for identifying nature conservation sites in London*. London Ecology Unit, 1994. Adopted by both the London Ecology Committee and London Planning Advisory Committee, and referred to in paragraph 7.25 of Regional Planning Guidance for London (RPG3). Metropolitan Sites include all biological SSSIs in London.

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^c Areas that have been continuously in woodland use since 1600 AD are considered ancient. Some of these have lost their semi-natural canopy through clearance and planting, but the more valuable ancient woodlands still have a semi-natural woody composition. It is believed that planting of new woodland was rare before 1600, so that most ancient woodlands have continuity through to the natural wildwood. Ancient planted woodlands also tend to be of high quality because they have had a long time to acquire species from nearby ancient woodland.

^f For example much of 60 Acre Wood in Kingston and of Epping Forest is not ancient, yet these two are among the very best wooded areas in London. Conversely, some ancient woodlands have been subject to unsympathetic management for many years and are far from Metropolitan Importance (for example Biggin Wood in north Croydon or Barnet Gate Wood in Barnet).

^g The Wet Woodland habitat action plan was published in 1998 (*UK Biodiversity Group. Tranche 2 Action Plans. Volume II - terrestrial and freshwater habitat*, English Nature). This includes all the wet woodlands described in this audit, except for the drier kinds of birch-purple moor-grass, and also wetter stands of the ash-maple-sycamore woodlands. We prefer to include all the birch-purple moor-grass, as the two NVC subcommunities excluded in the national plan are generally wet where they occur in London. Nationally there are estimated to be some 25,000 to 30,000 ha of wet woodland in ancient semi-natural woodland and as much again in secondary woodland.

^h The Lowland beech and yew habitat action plan was published in 1998 (*UK Biodiversity Group. Tranche 2 Action Plans. Volume II - terrestrial and freshwater habitat*, English Nature). It includes all the beech and yew woodlands described in this audit. Nationally there are estimated to be 15,000 to 25,000 ha of ancient semi-natural woodland in these community types and a further 30,000 ha of recent beech woodland. Much of this is beech-bramble (45%) or beech hangers (40%) and only about 15% is acid beech woodland.

ⁱ It lists the weevils *Melanapion minimum* & *Rhynchaenus testaceus*, the craneflies *Lipsothrix escullata*, *L. nervosa*, *L. errans* & *L. negristigma*, and the netted carpet moth *Eustromia reticulata*.

^j Devil's bolete *Boletus satanus*, a hedgehog fungus *Hericeum erinaceum* and the knothole moss *Zygodon forsteri*.

^k Rodwell, J.S. (Ed) (1991). *British Plant Communities, Volume I, Woodlands and Scrub*. Cambridge University Press.

^l Figure 7, page 21, of Rodwell (1991).

^m These are adopted by the London Ecology Committee on the recommendation of the London Ecology Unit, following the *Policy, criteria and procedures for identifying nature conservation sites in London*, London Ecology Unit, 1994. They include all biological SSSIs in London.