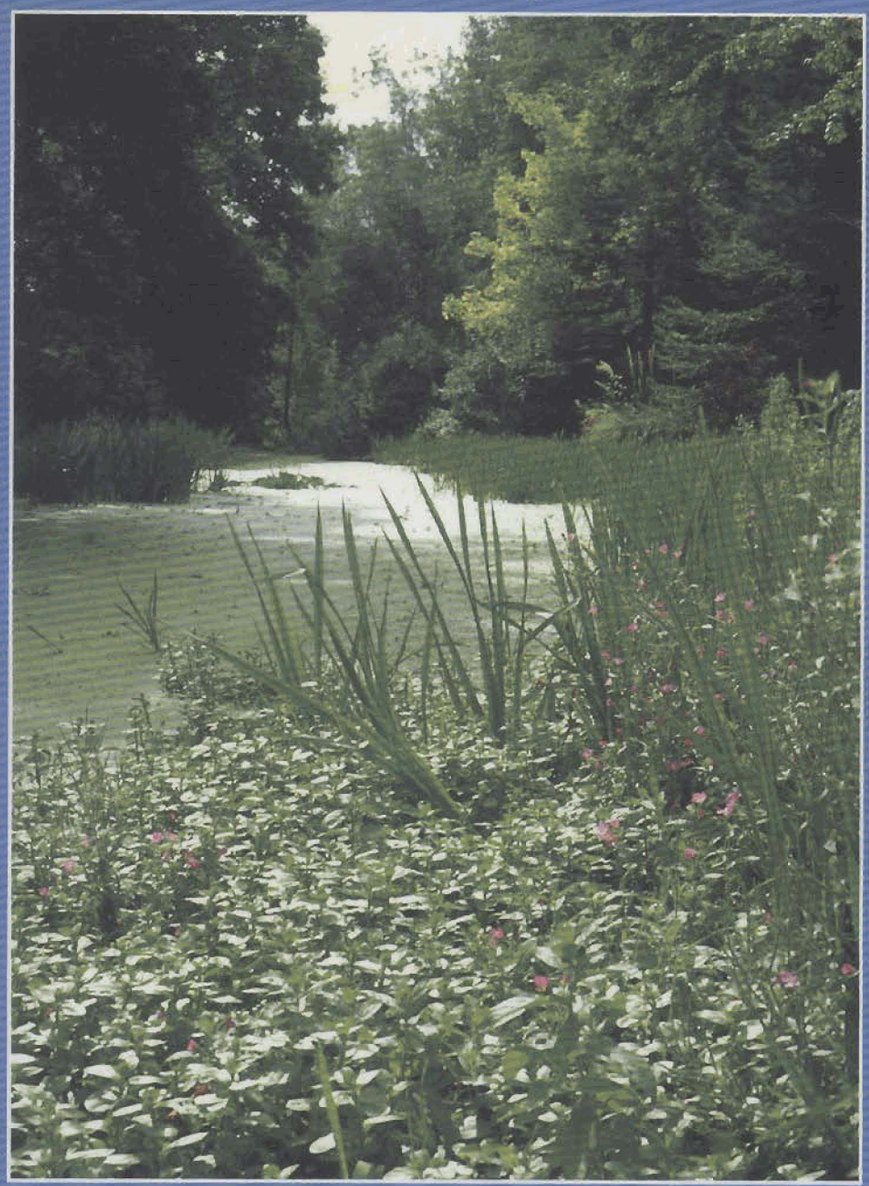
Nature Conservation in Kingston upon Thames



Ecology Handbook 18

London Ecology Unit

FIGURE 1
The landscape of Kingston upon Thames

Contours, rivers and other features of interest in and near the Royal Borough of Kingston

Nature Conservation in Kingston upon Thames

Sue Swales, Ian Yarham and Bob Britton

Ecology Handbook 18

LONDON ECOLOGY UNIT

First published in Great Britain by the London Ecology Unit, Bedford House, 125 Camden High Street, London NW1 7JR. *Phone* (071) 267 7944

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library.

ISBN 1-871045-13-4

Printed by Lithosphere on Sylvancoat paper, containing: 45% Grade B waste paper (chemically-pulped paper, unprinted) and 45% Grade C waste paper (chemically-pulped paper, printed, which may contain some post-consumer waste), plus 10% new wood fibre.

Front cover
The uppermost pond at Fishponds, Surbiton
LEU / Meg Game

Back cover
Wild Strawberry in Sixty Acre Wood
Meg Game

THE ROYAL BOROUGH OF KINGSTON UPON THAMES

The London Ecology Unit thanks the Royal Borough of Kingston upon Thames and the National Rivers Authority, Thames Region, for their financial assistance towards the publication of *Nature Conservation in Kingston upon Thames*

NRA
National Rivers Authority
Thames Region

Acknowledgements

Many sources of information have been used during the writing of this handbook, including recent fieldwork by staff of this Unit, the Wildlife Habitat Survey of London, carried out by the London Wildlife Trust for the Greater London Council during 1984 and 1985, and material gathered from published and unpublished literature. Any errors or omissions must of course remain the responsibility of the staff of the London Ecology Unit.

Officers of the Borough have been very helpful during the compilation of this handbook, especially Jeff Grace, Roy Boot and Andrew Watson of the Horticulture Section, Richard Jones and Joanne Horne of the Planning Department and Sylvia Angell, the Environmental Co-ordinator. Much help with historical details was given by Anne McCormack, Borough Archivist, Ian George and Paul Hill, Sites and Monuments Record Officer at the Kingston Museum and Heritage Centre.

Any work of this kind depends on contributions from many people. A great deal of very detailed and useful information was received from John Hodge of the Surrey Wildlife Trust for which we are particularly grateful. We are also grateful for additional information and helpful suggestions from the following: G Dougherty of the Surrey Wildlife Trust, Jeff Edwards formerly of the London Wildlife Trust, Chris Hansen of the London Wildlife Trust (Kingston Group), Joanna Hunter of the Kingston Conservation Volunteers, Peter Johnstone and Helen Cocker of the Lower Mole Countryside Management Project, Dr R Lindley, Pat Nicolaysen and Richard Watson of the Kingston upon Thames Archaeological Society, Jane Priestman of British Rail, Patrick Robinson of English Nature, Dawn Thornton, formerly of the Nature Conservancy Council, Councillor Eileen Gray of the Royal Borough of Kingston, and Isobel Porter of Kingston Polytechnic, Kingston Hill.

Thanks are also due to Dave Sindall and Alan Pope of Thames Water Utilities, A Foster of the Coombe Hill Golf Club, Tom Duncan of Coombe Wood Golf Club and M Blanford of Malden Golf Club for allowing access to sites.

Staff of the London Ecology Unit who also assisted with the editing and production of the handbook are John Archer (Series Editor), Dave Dawson, Meg Game, Sue Lovemore, Niall Machin, Ines Ferreira (maps) and Barbara Morris (typography). The section on Educational Initiatives and School Nature Areas was written by Julie Brownbridge. The site descriptions for Sixty Acre and Jubilee Woods, and Kingston Polytechnic were written by Meg Game, The Cassel Hospital by David Curson and the Beverley Brook by Dave Dawson.

About the London Ecology Unit

The London Ecology Unit works to develop new ways of creating a greener and pleasanter urban environment. It advises planners, developers and local people on how to protect wildlife areas in towns and how to create new habitats for plants and animals. The Unit has carried out extensive surveys of London's wildlife, ecology and landscape history. Funded by most of the London Borough Councils, the Unit has the support of the Countryside Commission and English Nature (the Nature Conservancy Council for England).

The Unit provides information and advice to local authorities and other agencies on all aspects of nature conservation and applied ecology. Its work includes the development of ecological policies for local planning, the assessment of the nature conservation value of specific sites, and advising on the appropriate management and development of sites to encourage wildlife and to provide new habitats.

The Unit maintains a database of London's wildlife habitats, with information on what is found in each place. These data are in constant use by the Unit and by many other organisations and individuals.

New work by the Unit includes guidance on developing nature conservation areas in towns, and how new wildlife habitats can be provided within urban development, including habitats on and around buildings.

This book is one of a series of publications produced by the London Ecology Unit. Other titles in the series are:

1 **Ecology and Nature Conservation in London**
2 **A Guide to Habitat Creation**
3 **Nature Conservation Guidelines for London**
4 **Woodland, Wasteland, the Tidal Thames and two London Boroughs**
5 **Nature Conservation in Brent**
7 **Nature Conservation in Hillingdon**
8 **London's Meadows and Pastures**
9 **Nature Conservation in Croydon**
10 **Nature Conservation in Greenwich**
11 **Nature Conservation in Waltham Forest**
12 **Nature Conservation in Southwark**
13 **Nature Conservation in Harrow**
14 **Nature Areas for City People**
15 **Nature Conservation in Hounslow**
16 **Nature Conservation in Ealing**
17 **Nature Conservation in Newham**
19 **Nature Conservation in Islington**
20 **Nature Conservation in Barking and Dagenham**

Our books are available from bookshops and from some libraries in London. They can also be obtained by post from the London Ecology Unit. For more details, please send an SAE to:

Booklist requests,
London Ecology Unit,
125 Camden High Street,
London NW1 7JR.

Contents

List of maps, diagrams and tables

Introduction

This handbook documents the wildlife of the Royal Borough of Kingston upon Thames, and the initiatives of the Borough Council and others to protect and enhance habitats for wild plants and animals. It is one of a series of ecology handbooks produced by the London Ecology Unit on nature conservation in London boroughs. These are intended as a guide to planners and land managers on how best to further nature conservation in the capital, for example through policies in Unitary Development Plans, development control and the way in which open spaces are managed. It will also be of interest to residents and visitors to Kingston who want to find out more about the green spaces, animals and plants of the Borough.

While much of the Borough is built-up, Kingston is fortunate in having considerable areas of open land, especially in the south and following the river valleys of the Hogsmill and Beverley Brook.

The Borough Council recognises the importance of wildlife and green spaces to people living in urban and suburban areas, and pursues policies to defend sites of interest from development and to manage its open spaces with nature conservation in mind. It also supports initiatives in the field of environmental education, including the establishment of nature areas in schools.

Nature Conservation in Kingston upon Thames was written using data from site visits supplemented by information from many other people, such as Borough officers, local naturalists and historians, and the Lower Mole Countryside Project. Extensive consultation on the text was carried out with interested parties, including Councillors and officers of the Borough, land owners and managers, relevant voluntary groups and local naturalists.

A full list of handbooks published by the London Ecology Unit and the former Ecology Section of the Greater London Council is given at the front of this book.

Part One

1 The landscape and geology of Kingston upon Thames

The Royal Borough of Kingston upon Thames protrudes as a long finger of land from the south-west corner of Greater London, with a broader base in the north, and is bounded by the River Thames to the west (figure 1). The Borough has an overall area of 3756 hectares and provides a home for over 135,000 residents (1990 figures).

The Thames here runs almost south to north, forming a boundary with the Borough of Richmond upon Thames on the opposite bank. Teddington Weir lies just downstream of the point where the northern boundary meets the river, so that all of the river adjoining the Borough is non-tidal.

The Borough's boundaries

The northern boundary of the Borough roughly follows the margins of Ham Common and Richmond Park, but a small corner of the latter is included in Kingston. At the north-east corner, the boundary meets the Beverley Brook, following this all the way south to beyond Motspur Park. The border then runs west across the watershed to the Hogsmill River, which it follows for a short distance upstream. The main branch of the river then turns south-east towards the springs of Ewell, while the Borough boundary continues south-west along the smaller Bonesgate Stream. In Chessington it abruptly leaves this stream and continues in a south-westerly direction, generally marking the division between agricultural land in Kingston and the open commons and woodlands of Epsom and then Ashtead. A presumed Saxon ditch and bank marks the boundary between Kingston Borough and Epsom Common for a short distance, continuing for about one and a half kilometres with Ashtead Common. The western margin of the finger runs along the edge of the extensive woodlands of Prince's Coverts, leaving most of Sixty Acre Wood in Kingston. Here again it follows no evident surface feature, but continues in a generally northerly direction until it meets the Thames at Seething Wells.

Residential centres

The original town of Kingston lies in the north of the Borough, centred around the only Thames crossing for vehicles between Richmond and Hampton (although there is a footbridge at Teddington Weir and a few small ferries for passengers only), and this is by far the most important commercial centre in the Borough. Although very much secondary to Kingston, Surbiton

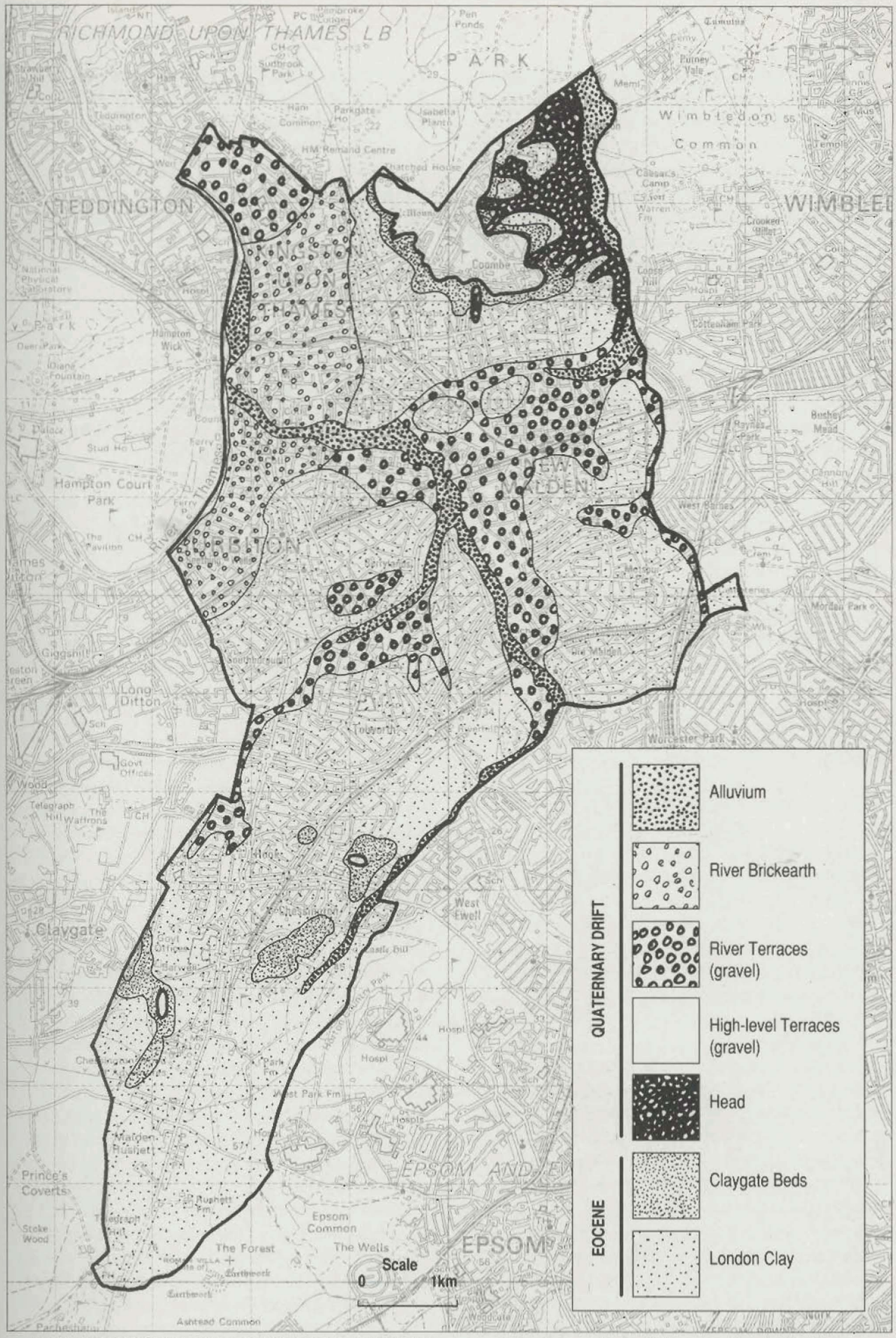


FIGURE 2 Underlying geological strata in Kingston upon Thames

is also an important focus in view of its excellent train service to London, which is far more frequent than that from Kingston. The Borough also includes a number of other formerly independent villages, now largely joined by suburban sprawl. These include Malden in the north, and Hook and Chessington in the south. Most of the north of the Borough, with the exception of the valleys of the Hogsmill and of the Beverley Brook, is now built-up, but south of Chessington there is still extensive open Green Belt, most of it farmed.

Roads and railways

A number of roads converge on the old town centre and bridge at Kingston. To ease the congestion caused by this bottleneck, the Kingston By-pass (A3) was completed in 1927, and now runs south-west/north-east across the centre of the Borough and then alongside the Beverley Brook. The by-pass was extended in 1981 by the construction of the Esher By-pass, which just clips the south-west of the Borough. The Leatherhead Road (A243) runs down the main axis of the finger-like projection in the south of the Borough.

Kingston is served by four railway lines. The main line runs through New Malden and Surbiton, while a branch line runs through the town centre. The Epsom line crosses the extreme east of the Borough at Worcester Park and a branch line leads from this to Chessington South.

Geology

The oldest and most abundant deposit forming the surface of the Borough is London Clay. This well known bane of Kingston's gardeners is a blue-grey clay which weathers to a dull brown on exposure, giving heavy damp soils. The London Clay was laid down about 55 million years ago in a shallow sea which then covered the London area. The clay has been excavated for brick making in the central and northern parts of the Borough at Fishponds and at Oak Hill, leaving steep-sided pits. Most of the few remaining ponds in the Borough, as at Old Malden and Barwell Estate, are on this formation.

The next oldest beds, lying on top of the London Clay, are the Claygate Beds, named after the village just to the west of Hook. These beds consist of fine silty sands and clays producing an acidic soil and, like the London Clay, were laid down during the Eocene Period. Most of the Claygate Beds have been eroded away but residual caps remain on higher land in the Richmond Park and Chessington areas.

None of the hills in the Borough are very high or particularly steep; the highest point in the Borough at Telegraph Hill in the extreme south is just over 90 metres above sea level, while Coombe Hill in the north is just over 50 metres, as is the eastern side of Richmond Park within Kingston. Because of the rather level nature of much of the Borough, even quite modest hills such as Winey Hill or Causeway Copse provide extensive views.

The summits of Winey Hill, Castle Hill and Coombe Hill are composed of High-level Terrace gravels. These are much more recent deposits of clayey gravels lying on top of the Claygate Beds. The gravels are often heavily leached at the surface and give very poor, acidic soils. The High-level Terrace gravels occur only as tiny fragments in the south of the Borough. On Winey Hill the terrace gravels have been enriched by past cultivation and now support an area of only slightly acidic grassland. In the north of the Borough much of these deposits has been excavated, as for example in the area now occupied by the Coombe Wood Golf Course, but in the few remaining areas of intact soils there are some fine examples of heathland and acid grassland.

Other relatively recent deposits, the gravels of the River Terraces, extend as narrow fingers up the valleys of all the rivers and streams in the Borough, and are particularly well developed in the valley of the Tolworth Brook. In turn, these gravels are overlain by narrow alluvial deposits along the present day watercourses. Most of these flat gravel lands are now built on, and only areas close to rivers remain as open land. Here the soils are rather fertile because of superficial alluvium, and, where semi-natural vegetation still exists, it is either of woodland or neutral grassland, depending on

Most of the Thames plain in Kingston is covered with River Brickearths, but this has been almost entirely built on. North of the town centre in the area of Ham Common the Brickearths are replaced by Flood Plain Terrace Gravels, on which stands the small part of Ham Lands lying within the Borough.

Rivers

The land surface of Kingston has been moulded by three river systems (figure 1), the Thames, the Hogsmill River and the Beverley Brook. The maximum width of the Thames flood plain in Kingston is only about one and a half kilometres, whereas on the opposite shore, flood plain gravels extend north-west towards Hounslow for over ten kilometres. This is due to the river being displaced further south with each successive glaciation. Today it is constrained within its channel by artificial flood banks, and flooding occurs only on a few low-lying areas immediately adjacent to the river.

The Hogsmill River drains most of the Borough and enters the Thames in the centre of Kingston town. The main source of the river is at the foot of the chalk of the North Downs and its upper reaches lie in the neighbouring District of Epsom and Ewell. A tributary, the Bonesgate Stream, runs the length of the Borough of Kingston, originating on the London Clay

almost at the Borough boundary in the south. A further small tributary, the Tolworth Brook, enters the lower course of the Hogsmill. Its main source is in The Grapsome and from it flows north through Lower Hook and forms the boundary with Surrey for about one kilometre. It passes under the Kingston By-pass and forms the old Surbiton-Tolworth boundary before passing through Raeburn Open Space to the Hogsmill.

The other river system in Kingston is the Beverley Brook, which rises in Worcester Park and forms the eastern Borough boundary all the way from Motspur Park to Roehampton Vale. Between Coombe Hill and Wimbledon Common it flows through a steep-sided valley. This stream has a short tributary, the Coombe Brook, which flows east across the Malden Golf Course to join the main stream.

Between the Hogsmill and the Beverley Brook, in the area of New Malden, is an almost level low watershed forming an east/west valley between the high land of Coombe Hill and Wimbledon Common in the north and the more gently rising land to the south of the Borough. A broad swathe of gravels of the Second River Terrace, laid down during glacial times, occupies the bed of this valley, indicating that at one time a river of considerable size flowed through here, where currently there is no watercourse at all. This valley and the gravel deposits extend as far east as the present course of the River Wandle, and it is possible that the Wandle once flowed west through the gap.

2 The history behind the landscape

There are only four boroughs in England and Wales which can add the prefix "Royal" to their names. They are Windsor & Maidenhead, Kensington & Chelsea, Caernarfon, and Kingston. The fact that Kingston is a Royal Borough is the first indication that it has a long and distinguished history.

Early settlements

There is little tangible evidence, apart from names, remaining from Kingston's prehistoric past. The evidence that does exist includes a scattering of finds from the Mesolithic Period along the valley of the Hogsmill River, a possible Bronze Age settlement and bronze foundry at Coombe, and a barrow, also probably of the Bronze Age, at the south end of Richmond Park. From the Iron Age/Romano-British period, a settlement has been discovered at Old Malden and fragments of a possible villa at Coombe. The pattern of finds indicates that Kingston was occupied in the Iron Age and in the Roman period. The old core of the town still possesses its basic medieval street pattern. Pevsner describes this as "the best preserved of its type in outer London", while Ian Nairn in *Nairn's London* says that Kingston has "without any doubt, the best town centre near London; in fact, one of the best in the country". Other remains in the Borough from before the sixteenth century are parts of the churches at Chessington, Kingston and Old Malden, the Lovekyn Chapel in London Road, Kingston, endowed in 1309 and rebuilt in 1352, the visible evidence of the Saxon St Mary's Chapel in Kingston church-yard, and the remains of a medieval undercroft or cellar, orginally part of the Rose and Crown Inn, and the footings of the medieval bridge, both recently excavated on the John Lewis site. These latter will be displayed on the redeveloped site.

Tradition states that the Thames was once fordable at Kingston, although it is unclear whether Julius Caesar crossed the river here or further downstream in 54 BC. Kingston was for centuries the first bridge above London Bridge, until the construction of the original Putney Bridge in 1729. The earliest definite evidence of a bridge at Kingston dates from 1193.

Royal Kingston

The regal connection with Kingston dates originally from the ninth century when a great Council was held in *Cyningestun* in 838 with King Egbert presiding. His son Athelwulf, the Archbishop of Canterbury, twenty-four bishops and all the leading nobles of Wessex were in attendance. Sixty-two years later, in the year 900, Edward the Elder, son of Alfred the Great, was crowned king of the Anglo-Saxons at Kingston. Six more kings were also crowned here – Athelstan in 925, Edmund in 940, Edred in 946, Edwy in 956, Edward the Martyr in 975 and lastly Ethelred the Unready in 979. A modern day visitor to Kingston can see these details recorded in the Eden Street Mural on the wall of British Home Stores, while the Coronation Stone itself can be seen in front of the present Guildhall.

The fact that Kingston was located at a river-crossing close to London may have been the reason why it was chosen as a place for coronations. Alternatively, it has been suggested that its proximity to the borders of Wessex and Mercia may have been a decisive factor, but the true reasons remain obscure. What is definite is that in the tenth century, Kingston was well-placed defensively, protected by the Thames to the west and low-lying marshes to the east, and situated itself on a gravelly elevation.

Domesday

By the time of the Domesday Book, in 1086, Kingston was an important royal manor and as such was held directly by the king. Describing Kingston it said "There is a church and five mills worth twenty shillings, and two fisheries worth ten shillings, and a third fishery very good but without dues". Settlements at Coombe, Old Malden, Tolworth and Chessington were also mentioned in Domesday, while Surbiton and Hook first occur in documents soon after. All of these places, other than Kingston itself, were small and isolated and stayed that way until the coming of the railways.

Medieval Kingston

Kingston received its first charter in about 1200, and a market is first mentioned in 1242, being held regularly on Saturdays from 1256. In medieval times, Kingston was at the centre of a large agricultural area stretching up to the slopes of the North Downs. A network of trackways, such as the one on the line of the present road from Leatherhead through Malden Rushett, focused on the town, crossing the commons and fields on their way. These were continually busy with animals and goods on their way to and from the town and its market.

Kingston's success as a market town, coupled with its position on the Thames, meant that the industries which developed in medieval times related to these factors – tanning and tallow chandlery from the former and fishing and boat building from the latter. Right up to the nineteenth century, the Market Place was the focus of Kingston and the streets radiated from there. The poorer people tended to live in the squalid back lanes north of the Market Place whilst the more prosperous tradespeople, such as the maltsters, were found to the south, alongside the river.

Even so, both industry and housing covered a relatively small area and beyond this stretched Norbiton and Surbiton Commons. The other significant feature of Kingston was its position where the Hogsmill River flowed into the Thames. A man named Hog is generally supposed to have built a mill by the river which now bears his name. This would have been either a corn mill or a water-driven cloth-fulling mill. The name Hog indicates that he was an Anglo-Saxon (possibly of Welsh origin) rather than a Norman. The river was not given its name, however, until much later. Previous names include the Malden River and the Lurteborne, the latter in 1439. The name Hog occurs again in 1179 when "the men (John Hog and about twenty others named) of Suberton, entered into an agreement with the Convent (or Priory) at Merton by which the men granted to the Canons a lease of land at Grapelingham for twenty-five years". The name of the latter place evolved over the years to become The Grapsome, which is now a small piece of woodland west of the Esher By-pass near *Chessington*.

Water-mills on the Hogsmill River

The Hogsmill was used to drive mills from before the Norman conquest until the early years of the twentieth century. The advantages of the river for this purpose were its non-navigability, its fall between source and the Thames, and its nearness to centres of population. A mill at *Cisendone* is mentioned in the Domesday survey and was probably located on the Bonesgate Stream near Castle Hill, Chessington; it was credited with "half a mill rated @ two shillings" (presumably shared with another manor) as well as "woodland rated @ 30 pigs". This was the "pig rent" which the villagers paid for pannage in the woods. The proportion of pigs paid is not shown here but in Malden it was one in seven, so there could have been some 200 pigs in Kingston.

Malden Mill, which was situated about one and a half kilometres below Old Malden Church, was also mentioned at Domesday. It was probably originally a corn mill but from 1720 to 1854 the site was used for the manufacture of gunpowder. By the early years of the nineteenth century, no less than twelve gunpowder mills were located beside the Hogsmill River in Malden parish. Like the more famous

gunpowder mills near Hounslow Heath, the Hogsmill mills were notorious for the explosions which happened with frightening regularity. On 2nd January 1742, at 1 am, the powder mill of Malden blew up with the magazine, containing forty barrels of gunpowder. Great damage was done to the houses, and the windows of the church – 400 metres away – were shattered. The explosion was heard in London and some twenty kilometres around. In 1854, two of the powder mills close to the road blew up after which gunpowder manufacture ceased! A new corn mill was built on the site but this was destroyed by fire in 1891. After being put to a number of other uses, such as growing water cress and printing silk, the site was cleared in 1950.

The undeveloped Beverley Brook

The other major river in Kingston, the Beverley Brook, did not have so much influence on the pattern of development, flowing as it does along the eastern edge of the present-day Borough. Its name is a reminder of the beavers which were once common in the marshes hereabouts. Even into the early part of this century there was no development to speak of anywhere along the Beverley Brook between Worcester Park and Barnes, apart from a few houses near where the river flowed under Burlington Road, at New Malden.

Water for Hampton Court

An interesting historical remnant relates to the supply of water to Hampton Court. In the early sixteenth century, Cardinal Wolsey leased the manor as a site for his new palace, and one of the factors that influenced his choice was the presence of springs on Kingston Hill from which a water supply could be obtained. This was because they were supposed to be beneficial for "the Stone" from which he suffered. The water from the springs was collected by brick feeders and taken to conduit houses. From these the water was taken via pipes passing south of Kingston town centre, under the Thames and through the Home Park to the Palace. The reliance on the Coombe Hill supply was reduced in thelate 1630s when the Longford River was constructed by Charles I to supply water from the River Colne to the lakes and fountains of Hampton Court and Bushy Parks, but the Coombe Hill conduits remained an important source of drinking water. At intervals the pipes were marked by "tamkins", which were small brick buildings to give access for isolating sections to carry out repairs. There was also unauthorised tapping by landowners across whose land the pipes ran, as the temptation of obtaining such clean water was too strong to resist. The conduits ceased to supply Hampton Court Palace in 1876 when the water had become contaminated. In 1894 the warrants for the supply of royal venison to landowners in lieu of rent were withdrawn. This had been in the form of "two fat bucks and two fat does annually in lieu of rent for the water supplied".

In 1896 the Duke of Cambridge bought the three conduit houses, feeders and pipes for £75 from the Commissioners of Works and Public Buildings. Following an inquiry into who was actually using the water supply now that it was no longer needed for the Palace, the whole system was terminated in 1900. Some of the pipes were dug up but in many cases they were left, as were the conduit houses. Of the three original houses, Gallows and Ivy Conduits were, by 1991, in need of repair, but Coombe Conduit, which is two joined houses and had been in a ruinous state, was restored in 1989 by English Heritage with a view to its being open to the public upon request. It is expected that either the Kingston Heritage Service or the Kingston upon Thames Archaeological Society will hold the keys to the site. In 1970 spring water from Coombe Conduit was still flowing into a settling tank at a rate of twenty gallons per hour and from there passed into a nearby surface drain. All three conduits are now in private grounds between George Road and Coombe Lane West, just outside the boundaries of the southern part of Coombe Wood Golf Course.

The influence of Merton Priory

Merton Priory has already been mentioned in connection with the grant of a lease of land at Grapelingham. Before the Reformation, the priory had considerable influence over the areas of land it owned in Kingston. In 1537, shortly before its dissolution, Merton Priory gave a lease to William Saunders of the "wood and underwood called *Gosborough Hyll* with a hedgerow ... in consideration of the sum of £10 for the term of six years"; he was allowed to "fell, cut down, make and carry away all the aforesaid woods and underwoods out of the said wood and hedgerow, so that they be felled in seasonable time of the year. And provided that he should leave standing and growing thirty "standers" upon every acre of the wood and make a sufficient hedge about the same for the preservation and safeguard of the young coppys and sprynges thereof". (Gosborough Hyll was later called Gooseberry Hill and Gosbury Hill, and the present day Causeway Copse at Chessington North is on the slope of the hill.) The lease shows the high standard demanded by Merton Priory for managing their woodlands, the aim being to maintain a steady source of well-developed trees of different ages from the same wood.

Into the nineteenth century

Until the coming of the railways, and the subsequent suburban spread, most of Kingston was essentially an agricultural landscape, with little industry or settlement. It is likely that commons, other pasture land and hay meadows, rather than arable production, predominated on the heavy clay lands that cover much of the Borough. Milne's *Land Use Map of London and Environs*, produced in 1800, but covering only that part of Kingston north of the town centre, shows that arable land was confined to the lighter gravel terraces along the Thames. The banks of the river were clothed in rushes and osiers which were used in basket making.

Although the turnpikes improved a few main roads in the mid eighteenth century, many local roads in the Kingston district were notoriously muddy and some were described in 1805 as being as bad as "some of the most inaccessible and uninhabited parts of Ireland" (Malcolm 1805).

The few settlements other than Kingston itself were no larger than small villages. Malden occupied a hill of London Clay overlooking the east bank of the Hogsmill River. Chessington was even smaller, standing on a hill of lighter gravel soils near the Bonesgate Stream in the south. Hook stood on a crossroads on the Leatherhead Road, at a spring source of the Tolworth Brook, again largely on a localised patch of gravel. The only other settlement was a line of houses and smallholdings straggling across Kingston Common and graced with the name of Tolworth.

The picture of the old town centre on its compact site, surrounded by Norbiton and Surbiton Commons with Kingston, Chessington and Malden Rushett Commons further south, and fields and small, isolated villages, remained largely unaltered until the first half of the nineteenth century. Then the enclosure Acts started to alter the landscape and the coming of the railways also set underway an irreversible trend.

The arrival of the railways

Land at Norbiton and Surbiton Commons was first allotted for development in 1838 by the Inclosure Commissioners, and in 1834 an Act for building a railway between London and Southampton received the Royal Assent. Local councillors in Kingston, coupled with the coaching interests and Lord Cottenham, owner of much of the land between Kingston and Wimbledon, objected to the railway running through the town, and so it was forced to pass some two kilometres to the south; a station opened in 1838 at what was then called "Kingston New Town" or, from 1841, "Kingston-on-Railway". This was subsequently renamed Surbiton. After 1838 Surbiton and Norbiton Commons were divided up for development, the farmed area to the north of Surbiton station being developed from that year by Thomas Pooley, a maltster. Several of his buildings survive, particularly in Claremont, Maple and Victoria Roads, and these form the focus of present day Surbiton. The fine houses and good rail service attracted wealthy commuters and earned Surbiton the title of "Queen of the Suburbs", a name that was also attached to Ealing some years later. In 1855 Surbiton became a separate local authority and continued to expand rapidly with handsome terraces and villas, accompanied by churches.

In 1846 a station was opened at New Malden, which was to the north of the existing village of Malden, the latter henceforth being known as Old Malden. Development around the station soon followed. No other stations opened on the main line until Berrylands in 1933, maps from early this century showing the area around here as farmland.

In the nineteenth century Kingston itself did not become a commuters' suburb and managed to preserve its identity, partly because it was limited to the north by Ham Common and Richmond Park, and to the east by the wooded slopes of Coombe Hill and Kingston Hill. The main reason, though, was because there was no railway nearer than Surbiton, and the inhabitants soon started clamouring for a direct line to the town. The railway finally came to Kingston in 1863 in the form of a branch line by the rather roundabout route from Twickenham to a terminus on the north side of the town centre. Continued grumbling at the lack of a direct route to London led to the continuation in 1869 of this line to join the main line at New Malden. Also in 1869, a railway from Raynes Park to Epsom was built, along which was Worcester Park station in the east of the present Borough. There was, however, very little development near this line until well into this century.

Rural views of Victorian Kingston

A picture of the more rural areas at the time was given by the Vicar of Malden, writing in 1850. "The roads were in a very rough condition and very bad. Being on stiff clay they required a good shoulder to keep them together and so were concave instead of convex. There were no pathways, and there was plenty of water lying in the ditches. As regards water supply, there were no wells in the parish, with the exception of the well at the Rectory, dug in former days through the clay some 326 feet to the chalk. General water supply was provided by the rain, and from ponds frequented by cows and ducks. The fields were small and surrounded by elm trees."

Some thirty years later, Richard Jefferies in his book *Nature Near London* gives a vivid picture of life in the countryside surrounding his house in Ewell Road, Surbiton. He describes owls and wood pigeons calling from Southborough Park; kingfishers and blackcaps haunting the damp

hollows by the Ditton Road; hares romping in the withy bed beside Claygate Lane and "everywhere wild flowers". This idyllic world was fast disappearing, however.

Development continues

By 1870 the Portsmouth Road was built-up, with streets leading off it almost as far as the present boundary at Seething Wells. Kingston itself remained quite small with development mainly to the east towards Norbiton, and open land remained around the Hogsmill River. Between 1864 and 1883, many leases of land were granted at Coombe Warren, near the present George and Warren Roads (this land had been part of Coombe Farm) as well as on the partly wooded common of Coombe Hill. The latter was acquired by the Duke of Cambridge and turned into a shooting estate before being split up for residential purposes and the development of a golf course.

The people to whom the leases had been granted built large houses with gardens of several acres. Coombe and Kingston Hills continued to be very desirable for the construction of the grandest mansions right up to the present day. These provided the setting for *The Forsyte Saga* by John Galsworthy. The mansions could be reached by a relatively comfortable drive from London and yet provided all the rural pleasures of Surrey. Coombe Hurst, built in 1835 and now a part of Kingston Polytechnic on Kingston Hill, gives a particularly good picture of what these houses and their grounds were like (see site Ki.BI 9).

The twentieth century

In 1894 Surbiton incorporated Southborough, Hook and Tolworth, and New Malden amalgamated with Coombe, both becoming Urban Districts which reflected their growing importance. The early part of the twentieth century saw the development of tramways from Kingston to Surbiton and New Malden, which promoted further housing, especially in the Tolworth area. Open land and farms which remained up to the First World War were steadily developed during the 1920s and 1930s. Electrification of the Epsom line and the opening of Motspur Park station in 1925 further aided the building of new estates, and in 1927 the opening of the Kingston By-pass heralded a wave of ribbon development on both sides of the road in New Malden, Tolworth, and to the north of Hook, in the form of small houses, shops and factories.

At this time, however, the valleys of the Hogsmill and its tributary, the Bonesgate Stream, were almost untouched by suburbia; the large area south of the new by-pass contained just three villages, at Old Malden, Hook and Chessington, together with a few Victorian and Edwardian villas at Motspur Park and Worcester Park. To this area came the final railway development in the Borough, which mostly ran parallel to and just south of the Kingston By-pass. Construction of the Chessington line from Motspur Park began in 1936 and opened as far as Chessington South by 1939. Intermediate stations at Malden Manor, Tolworth and Chessington North were opened and, although there was some further house-building, especially near Chessington North, before the Second World War, the majority of the building stimulated by this line came after 1945. This was largely to the north and west of the line, and even today the area to the south and east along the valley of the Hogsmill River and Bonesgate Stream remains relatively undeveloped and rural except in the immediate vicinity of Malden Manor and Chessington North stations. Builders, of course, took advantage of this situation, advertising houses as convenient for both London and the countryside.

Powers had been obtained to continue the line on to Leatherhead but work halted following financial problems and the onset of war. When abandoned, the railway had reached a goods yard just south of Chessington, now occupied by Government buildings. However, in 1941-42, Royal Engineers on a training exercise carried the embankment on from Chalky Lane, where work had stopped, as far as Chessington Wood, only 400 metres north of the next intended station at Malden Rushett. This work, together with the remains of the railway fences, can still be seen today. Following the war, most of the undulating wood and common land south of Chessington became part of the Green Belt, and today this line still terminates at Chessington South, where much of its traffic is to and from the nearby World of Adventures (formerly Chessington Zoo).

In the twentieth century Kingston had acquired the light industries common to many other places at the same distance from London, together with some rather more specialised manufacturing. The latter includes the large British Aerospace factory, which opened in 1912 as the Sopwith Aviation Company and later became the H G Hawker Engineering Company Ltd before becoming British Aerospace. (It has recently been announced that the factory is to be run down and closed over the next year or so.) Industry was particularly encouraged from the 1920s by the opening of the Kingston By-pass. In more recent times, there has been a growing concentration of Government offices near Tolworth and Chessington South stations, and Tolworth Tower, a very prominent landmark, was opened in the 1960s. This shares the distinction with Telegraph Hill in the extreme south of being the highest point in the Borough! The small Chessington Zoo has expanded to become the large Chessington World of Adventures, and attracts people from a very wide area, as does Kingston town centre, which is now a major regional shopping centre. Large scale development is currently taking

place in connection with the Bentalls and John Lewis stores, and the main shopping streets have been pedestrianised. Smaller shopping centres such as Surbiton and New Malden serve more local needs.

The 1930s had seen the expansion of the built-up area south to its present extent, taking in Hook, Chessington and Old Malden. Since the war there has been little further expansion of the built-up area, mainly because of Green Belt policies in the south of the Borough, and constraints on development in the flood plain of the Hogsmill River.

A view of Kingston today

On an image taken by satellite, certain features of the Borough stand out from the general mass of building. The Thames, of course, the main railway line from Raynes Park to Esher and the Kingston By-pass are prominent linear features, and the larger open areas such as Coombe Hill, Hogsmill Valley Sewage Works, and the Malden Golf Course all show up. Apart from the dominant areas of Richmond Park, Wimbledon Common and Hampton Court Park, which lie mostly just outside the Borough, the clearest image is the bright green of the Hogsmill and Bonesgate Stream Valley leading from Berrylands, widening at Riverhill and Tolworth Court Farm, narrowing again before Castle Hill and then spreading out into the fields and small woodlands of the Green Belt. The Borough boundary, south of the B280 through Malden Rushett, is clear even from 500 miles up, showing as an island of agricultural land largely surrounded by woodlands, parks and heaths. There is an historical reason for this. Nearly all of the extensive common lands in the Borough were enclosed and converted to agricultural use, or later to housing, but many of those in the surrounding districts were retained until a later date and survive as woodland, parks and heaths.

Few people are likely to be able to view the Borough from this height, so a more earthly viewpoint has to be chosen to leave a few final impressions of the Borough's development over the last thousand years. Standing on Telegraph Hill, or the more accessible Winey Hill, the old trackway leading from the North Downs to the ancient market of Kingston now takes the form of the very busy Leatherhead Road. When watching the cars speeding continuously by, it is difficult to imagine cattle plodding their way towards Kingston, stopping on the way to rest or feed on the grassland of Malden Rushett and Chessington Commons alongside. Chessington Common has now virtually disappeared, but Malden Rushett Common still stretches alongside most of the main road between Malden Rushett and the Borough boundary, past the foot of Telegraph Hill. The common still has exactly the same boundaries as 150 years ago, although much of it is now wooded. From Telegraph Hill one can gaze across the fields to the very clearly defined Borough boundary, with the woods of Ashtead Common and Prince's Coverts in Surrey starting immediately beyond. From Winey Hill the impressive line of Sixty Acre Wood marches down the hillside to the south, while to the west traffic on a much more modern highway, the new Esher By-pass, hastens past the waters of the recently-created Barwell Estate Lake.

From both viewpoints, but particularly from Winey Hill, modern developments draw attention to the contributions of the twentieth century to the scene. The amusements and noise from Chessington World of Adventures remind one of the trend in the latter half of the century towards mass entertainment, while the more distant Tolworth Tower signifies the commercial development of the Borough in recent years. Far beyond that, a number of prominent buildings in the City of London, and now also Docklands, measure the closeness to and yet the distance from London, so that while the Royal Borough of Kingston upon Thames is part of Greater London, yet it has a very clear and separate identity of its own.

3 Kingston's wildlife habitats

Most wildlife habitat within the Borough is concentrated around the rivers and streams, or else lies within the Green Belt on Kingston's southern tip. Major exceptions to this are the golf courses and Richmond Park in the northern part of the Borough.

In 1984/85 the Greater London Council commissioned the London Wildlife Trust to undertake a wildlife habitat survey of the whole of London. In Kingston, a total of 45 sites were documented in detail (figure 3). A breakdown of the area covered by the Wildlife Habitat Survey into broad habitat categories is given in figure 4.

Grassland

Of the wildlife areas documented by the Wildlife Habitat Survey in Kingston, the most common habitat type was neutral grassland (semi- or unimproved). Most British grasslands rely on people for their continued existence; without grazing or cutting, trees and shrubs invade and as they develop, grasses and associated flowers are shaded out. Despite this, grasslands can be ancient habitats, possibly hundreds of years old, where they have been managed appropriately throughout this time.

Over the last 50 to 100 years we have been losing our ancient meadows and pastures, together with their associated species-rich flora and fauna, through "improvement" in order to increase productivity. We have now lost 95% of our lowland, flower-rich, neutral grasslands, largely through agricultural intensification. "Improvement" involves the use of fertilisers and pesticides and operations such as drainage, ploughing and rotavating. These processes destroy the ancient soil structure, together with many of the organisms within it. They also raise the levels of nutrients in the soil, allowing common, coarse, competitive grasses to take over and drive out the less competitive wild flowers and finer-leaved grasses.

The neutral grasslands in Kingston are concentrated along the valley of the Bonesgate Stream and Hogsmill River. From Chessington northwards, there is an almost uninterrupted belt of grassland-dominated open space alongside the river extending as far as Kingston Cemetery, almost in the town centre. In places this grassland is too intensively managed (for example as sports pitches) to be of great wildlife value, but good quality meadows and pastures also occur throughout its length.

The best, most floristically-rich examples of neutral grassland in the Borough can be found at Tolworth Court Farm. One of the fields has been grazed for years, whilst the other has had a hay crop removed annually, both these treatments resulting in sheets of wild flowers, but the different management regimes have produced very different communities. Other species-rich grasslands are found in the grazed paddocks and unkempt field margins to the north of the medieval moated site at Tolworth and beside Riverhill House. These fields also contain wetter patches, with a mixture of damp grassland and wetland species.

Further north (and downstream) from here the river turns sharply north-westwards, and on the steep hillside above the bend remains a tiny patch of Old Malden Common, formerly grassland but now, through lack of management, turning into scrub. North of Old Malden Common can be found the main part of the Hogsmill Valley, a large area of neutral grassland forming a ribbon of open land, with housing either side, extending to the main railway line at Berrylands. Much of this grassland has been improved and converted to sports pitches, but beside the river a large tract is managed by the Borough as Public Open Space. Their foresight in using a variety of mowing regimes is resulting in the development of botanically-rich meadows, some of them subject to the favourable influence of flooding.

Branching south-west from the Hogsmill Valley is the Raeburn Open Space which extends along the Tolworth Brook, and consists of both improved and semi-improved grassland. Elsewhere in the Borough, valuable neutral grassland is represented on the banks of the Esher By-pass, in the roughs of the Malden Golf Course, and in parks where mowing regimes have been relaxed in places, as at Manor Park and Fishponds.

Although chalk is absent from the geology of the Borough, one chalk grassland community does exist, at Seething Wells Reservoirs. Here the sloping retaining banks were either constructed from a base-rich substrate or else, where brick work was used to stabilise the banks, the mortar between the bricks has mimicked dry, chalkland conditions. The resulting sward is a blaze of colour in early summer.

Acidic grassland must once have been widespread on the commons, but only a few remnants survive, the largest areas being in Richmond Park and on Coombe Hill Golf Course, which both lie on the leached gravels of the High-level Terrace. In autumn, this type of grassland takes on a characteristic reddish-brown tinge due to the fescues, bent-grass and sheep's sorrel which are the major components of the sward. Small and less intact fragments of acid grassland also occur

on Winey Hill, where past ploughing has reduced the sward's diversity, and at the Malden and Coombe Wood Golf Courses, which lie on the less acidic River Terrace Gravels.

Heathland

Coombe Hill Golf Course also contains some of the most extensive areas of heathland in the London area. Both heather and bell heather produce purple patches alongside the fairways, whilst periodic mowing keeps the tree seedlings down. In the past the heath would have been more extensive and trees would have been prevented from colonising by grazing pressure.

Hedges

Kingston is particularly well endowed with old hedgerows. These relics of a rural agricultural way of life are concentrated in the southern quarter of the Borough, within the Green Belt, but excellent examples can be found in the urban areas further north, such as those of Tolworth Court Farm and rather overgrown remnants along the Hogsmill Valley and Raeburn Open Space.

Hedgerows composed of a variety of species will produce an assortment of berries and nectar throughout the year: vital sources of food and shelter for birds, insects and small mammals. A surviving network of species-rich hedgerows, even if the enclosed fields are species-poor, is an excellent habitat for wildlife in its own right and one which is disappearing in Britain at an alarming rate. In 1947 aerial photos revealed the existence of over 500,000 miles of hedges in Britain. By 1974, 140,000 miles of these had been grubbed up (Nature Conservancy Council 1984). Urgent measures are needed to preserve those remaining.

Generally, the more woody species composing the hedge the older it is, hence the oldest hedges tend to be the best for wildife. A rule of thumb method for dating a hedge is to walk along a 30 metre stretch and to count the number of woody species present. For each species counted, add 100 years to find its age. This is of course very approximate but should normally distinguish ancient hedges from post enclosure Act (late 18th to early 19th century) ones, as the latter tended to be planted with hawthorn only. This method, developed by Dr Hooper and hence called Hooper's Rule, depends on several factors. Hedges were often thin strips of woodland remaining after clearings had been made to create fields. The species present reflected the mixed composition of the old woodland. In earlier times, when a new hedge was planted, it was the custom to use a wider range of species than in more recent periods. Finally, whatever its origins, a hedge acquires new species with time, since seeds are brought in by wind and animals. Hedges planted after 1700 and at the time of the enclosure Acts tend to contain only one to three and rarely four woody species per 30 metres whilst older hedges, often dating back to medieval times or before, tend to have five or more species.

Using Hooper's Rule, many of the hedges in the Borough's Green Belt and at Tolworth Court Farm are very old indeed. Field maple, a species found in some of Kingston's hedges, is not a good coloniser and was rarely planted, hence is very seldom found in recent hedges. Hazel, found in some hedges in Tolworth, is even less able to colonise and is rarely found in hedges of post-Tudor age. Further evidence of antiquity of the Tolworth hedges lies in the presence, in several places, of coppiced trees, in this case hazel and ash. Along the Hogsmill Valley, the old hedges, arranged at right angles to the river, are still visible. Those nearest Malden are very close together, separating narrow strip fields which ensured access to the river for each owner. Oak-dominated hedgerows alternate with elm-dominated ones here, suggesting that the original fields were subdivided at a later date.

Movement of people, goods and livestock made the existence of a network of tracks and drove roads necessary from the earliest times, particularly those leading to Kingston and its famous market. In the past they consisted of an unsurfaced track of variable width, enclosed either side by hedges. Most of these tracks have now been transformed with tarmac into our present-day roads, but some fragments still remain in a relatively little-changed state. The best examples are Green Lane near Hook and the bridleway leading north into Chessington Wood. The lane from the southern tip of Kingston to Malden Rushett now lies under Leatherhead Road (the A243), but its wide borders still remain as Rushett Common, now covered in trees but originally rough grazing for livestock being driven to market.

Woodland

After grass and parkland, woodland is the best represented habitat in the Borough. Despite being almost surrounded by woods, to the south of the Borough at least, Kingston contains only two of any size: Sixty Acre Wood, which, together with the adjoining Jubilee Wood, covers about 21 hectares, and Chessington Wood, which covers six hectares. The remaining woods are generally less than three hectares in area and are often in the form of narrow strips surrounded by other habitats or by built-up areas.

According to the evidence from old maps, there is very little truly ancient woodland in Kingston. Fragments of the old Coombe Wood, which once covered a large area, remain in the north of the Borough in strips of wooded roughs on Hill Golf Course, in Coombe Hill Wood nature reserve

(also known as Hopping Wood) and as some scattered and very gnarled oak trees in the grounds of Kingston Polytechnic on Kingston Hill . In the south-west of the Borough, a small fragment of ancient wood persists at The Grapsome. Ancient woodland is defined as any which has been continuously present for over 400 years. Any woodland which has survived since 1600 is more than likely to be much older, and may well have remained tree-covered since trees first colonised the land after the last Ice Age, about 10,000 years ago. During these long periods under tree cover, the woodland soils have developed their own particular structure, closely linked with specialised micro-organisms and invertebrates. A group of fungi (known as mycorrhiza), lives in the soil and forms a partnership with trees and wild flowers. They aid the roots in taking up nutrients in return for food produced by the plants. In the process, the living threads of each fungus connect not only the roots of members of the same species of flowering plant, but also the roots of different species. Thus the ancient woodland habitat is composed of a delicate web of inter-relationships, both above and below ground, between members of the woodland community and their environment.

Ancient woods have been managed by people for thousands of years, often as "coppice with standards". Coppicing involves cutting down trees almost to ground level, producing coppice stools, which later sprout to produce even-aged shoots or poles. The woodland is divided into blocks and the blocks are cut in rotation, usually every seven to 30 years depending on the thickness of pole required. Some trees, the "standards", are left to grow, scattered throughout each block, through several coppice cycles to provide timber.

This sustainable form of management maintains the woodland flora and does not disturb the delicate structure of the woodland soil. However, if the trees are clear-felled and then the soil is ploughed or rotavated as a preliminary to sowing grass or planting crops, permanent and irreversible damage is done. Should trees be replanted here at a later date, for centuries the resulting woodland would not have the diversity of an ancient woodland. A range of plants called ancient woodland indicators are rarely found elsewhere (for example wood spurge, wood millet and wood anemone).

Kingston's largest woodland, Sixty Acre Wood, is somewhat of a mystery, bearing the above in mind. It contains perhaps the best woodland flora in London, including many ancient woodland indicators, and yet there is clear evidence that most of the area was not tree-covered for a period about 200 years ago. Claygate Beds underlie the higher ground in Sixty Acre Wood, with damp London Clay towards the lower slopes. This has resulted in a range of soil types clothed in a mixture of dry and damp woodland of ash, oak and chestnut, and an extraordinary variety of plants indicative of both acidic and calcareous soils.

The Grapsome is another, though minute, area of what appears to be ancient woodland, which was also managed as coppice with standards in the past. Wood millet is particularly abundant here.

The remaining woodlands in Kingston are secondary woods, or woods which are growing on land which has been clear-felled and used for a purpose other than woodland within the last 400 years. Oak dominates the tree canopy in Chessington Wood and on Castle Hill, which both occupy clay soils, but conditions in the former are much damper. The secondary woodlands at Riverhill House further down the Hogsmill River have a less natural feel because of the various exotic species, particularly conifers, which have been introduced. However, some fine oaks remain, due largely to the inclusion of existing hedgerows and their timber trees when the woods were planted. A strip of mature willow woodland lines the Hogsmill River south of Riverhill House. The ancient, twisted trunks of these trees, many of which have split and resprouted, are a fine sight and their many cracks and crevices provide homes for a diverse insect fauna. Further south, the Bonesgate Stream winds its way through the Green Belt between mostly wooded banks. Although this woodland is a good habitat in itself for wildlife, for much of the stream's length the trees cast such heavy shade that the ground flora is poor and water plants do not have enough light to colonise.

Secondary woodland can be found also in the northern half of the Borough on the Richard Jefferies Bird Sanctuary and adjacent park, at a small copse in the Hogsmill Valley, as part of Manor Park and in the grounds of Kingston Polytechnic on Kingston Hill .

In the southern half of Kingston, Rushett Common and Chessington Wood are the most extensive areas of secondary woodland (excluding Sixty Acre Wood, if this is indeed secondary). Once grazing on the common land ceased, scrub and then trees moved in, and now oak woodland with a mixture of other trees has taken over much of the site. Fragments of relatively recent woodland can be seen at several other sites.

Ponds, lakes and marshes

Ponds are now very scarce in the Borough, and all remaining examples are in need of protection. Old Malden Pond is a relict village pond, the last remaining of three at Old Malden, now enclosed by railings and supporting a fairly diverse aquatic flora and fauna. There is an attractive and well-cared for pond in the grounds of Kingston Polytechnic, Kingston Hill. It contains four species of amphibian, which is the highest number in the Borough. Ponds with three species include those at Fishponds and at Barwell Court, between Winey Hill and the Esher By-pass. Barwell Estate Lake in the south-west of the Borough, although a recent creation, is developing well and already attracts a range of wildfowl as well as damselflies

FIGURE 3 Wildlife habitat in Kingston upon Thames

Areas of wildlife habitat in Kingston and nearby in neighbouring boroughs which were documented in the 1984 GLC Wildlife Habitat Survey

and dragonflies. Its banks are rapidly accumulating a good range of wetland plants and this is probably the most extensive area of such vegetation in the Borough. The lake is a valuable addition to the landscape as well as having great conservation potential. The only other large areas of aquatic habitat (excepting rivers) in Kingston are the Hogsmill Valley Sewage Works and Seething Wells Reservoirs. The sludge lagoons of the sewage works range from open shallow water through to almost dry mud and are very rich in micro-scopic algae and invertebrates. This abundance of life attracts many birds to feed and nest. These include lapwings and redshanks, which rarely nest in London but find the sewage works a desirable residence. In winter, snipe and jack snipe are present, while green and common sandpipers are among the wading birds visiting on their spring and autumn migrations. In winter, wildfowl make good use of Seething Wells Reservoirs beside the Thames; as at the sewage works, they are left in relative peace and quiet because both sites are out of bounds to the public.

A small but intriguing wetland is to be found at the medieval farmstead beside Tolworth Court Farm. Although severely shaded by a dense growth of hawthorn and other shrubs and semi-mature trees, the three-sided moat, possibly around 700 years old, can still be traced by the dense growths of reedmace and reed sweet-grass. These vigorous plants have helped over the centuries, through their rapid growth and accumulated dead remains, to bury this ancient feature.

Rivers and streams

The River Thames is, of course, the largest flowing water body in the Borough. Since it was not surveyed in detail during the Wildlife Habitat Survey, the area of the Thames has not been included in figure 3. Unfortunately, most of the river bank is now clad in concrete, but a short length of natural bankside vegetation survives north of the town centre, one of the few and diminishing natural stretches along the whole length of the river in Greater London. Parts of the other river systems in the Borough are included in sites selected mainly for their terrestrial habitats.

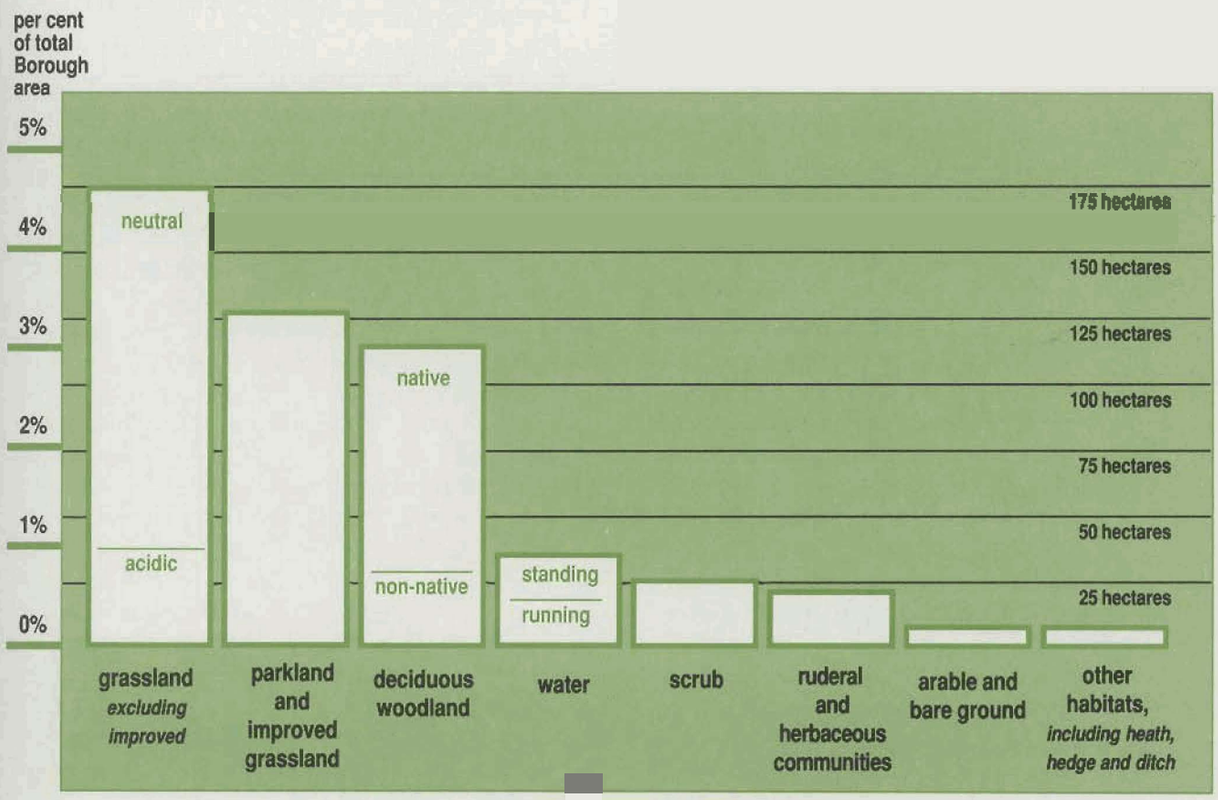


FIGURE 4 Extent of habitats in Kingston upon Thames surveyed during the GLC Wildlife Habitat Survey

Areas are given as percentages of the total surface area of the Borough. Running water does not include the river Thames. Not all parkland, improved grassland, arable, bare ground and "other habitats" were covered in the survey.

The Hogsmill River reaches Kingston on the south-east side of Tolworth Court Farm and, turning north-east, forms the Borough boundary through Riverhill and into the site we call "Hogsmill Valley". A turn to the north-west continues it through this site as far as the main railway line near Berrylands, past where it flows through the Hogsmill Valley Sewage Works. Finally, after passing through a heavily-developed area of housing and industry (see site Ki.L 9), it discharges into the River Thames. The Bonesgate Stream flows into the Hogsmill at the point where the latter meets the Borough boundary. Rising in the south of the Borough, the Bonesgate Stream trickles through farmland between narrow, densely-shaded banks. Only in a few places, where light can find its way down to its banks, are there any aquatic plants. A long section of the Bonesgate Stream between Chessington Wood and Castle Hill has been included in its own right and further sections of the stream have been included in other sites: Chessington Wood, Castle Hill and Tolworth Court Farm. Tolworth Brook, which rises at The Grapsome, flows through Edith Gardens Allotments and Raeburn Open Space. Sections of the Beverley Brook can be found in a number of sites, particularly the ones here entitled "The Beverley Brook" and Wimbledon Common, whilst the Coombe Brook runs across Malden Golf Course.

Other habitats and wildlife areas

Although the sites listed include the best wildlife habitats in the Borough, there are many other areas that make a significant contribution to nature conservation. Many of the larger gardens in areas such as Coombe Hill, for example, contain pockets of woodland and other natural habitats. The same is true for many institutional grounds, including places where habitats are also of amenity and educational value. A particularly good example is the grounds of Kingston Polytechnic, Kingston Hill, which have been included as a site in their own right . Many schools in Kingston have created wildlife gardens in their grounds (see Chapter 5, *Educational Initiatives*). Allotments, when abandoned, also offer scope for creation of miniature nature reserves. Even the most modest suburban garden can have value for wildlife in the form of a garden pond, bird table and shrubberies.

Some of the more extensive parks in the Borough, or those with particular wildlife habitats, such as ponds, are included in the list of sites, but many others are devoted largely to sports facilities or playgrounds and therefore consist mainly of short-mown turf or hard surfaces. Even in these sites there will be some wildlife value, especially where there are mature trees or less intensively-managed corners. All but a few of the most formal parks show great potential for habitat creation. More naturalistic planting in less-used areas makes the landscape more varied to the visitor's eye as well as encouraging wildlife.

Cemeteries usually have to be kept neat and tidy, but the presence of numerous trees and less intensively-managed grassland can make them more attractive to wildlife. Kingston Cemetery, beside the Hogsmill River, is an example of such a site in a mainly built-up area.

In the Green Belt in the south of the Borough, none of the actively-farmed areas has been included in the list of sites, although even here the hedges and field boundaries will support a wide range of plants and animals, and the crop fields and grassland are of importance to birds at certain times of year. The ploughed fields of Rushett Farm in winter host flocks of lapwings, finches, and good numbers of redwings and fieldfares. The occasional barn owl has also been seen in this area: a species requiring rough pasture land in which to hunt. With the present agricultural surpluses, it is possible that there may be moves to take some of this land out of agricultural production. Should this be the case, the proximity of large centres of population would make it desirable that this land be made more available for quiet recreation. Such land use changes could also have a beneficial effect on nature conservation in the Green Belt. At present the footpaths that traverse the Green Belt in Kingston give a real sense of countryside and they also pass close to or through many sites of wildlife value such as Chessington Wood, Sixty Acre Wood and Winey Hill.

4 The role of the Borough Council

The Council of the Royal Borough of Kingston promotes care for, and interest in, the natural environment in several ways. These are through its roles as the statutory local planning and education authorities, as manager of large areas of open land, and through liaison with the local communities and v___ ary organisations. The Environmental Co-ordinator, employed by the Borough, liaises with organisations within the community, such as businesses, religious groups, residents' associations, schools and other educational establishments, to increase environmental awareness throughout Kingston. Many of the projects initiated or aided by this officer result in a physical improvement to the environment, for example by litter collection and recycling, and tree planting. (See also Chapter 5, *Educational Initiatives*.) A regular programme of events creates the structure for the Council and community to work together to improve the environment.

management

The Leisure and Recreation Department is responsible for the management of many of the Borough's open spaces. Schemes have been running for several years now to improve Kingston's open spaces for wildlife and make them more attractive to local residents. For example, in the Hogsmill River Park and on Raeburn Open Space, all grassland used to be frequently mown, producing acres of closely-cropped sward. Wide borders are now left unmown, or are cut only once or twice a year, allowing a colourful display of wild flowers to thrive, which in turn attract many butterflies, bees and other insects. At Surbiton Lagoon, just to the south-west of Raeburn Open Space, a new park has been sown with wildflower seed mixes, and, once established with suitable management, should become a valuable wildlife site as well as an attractive place for local residents to sit in peace and quiet.

Herbicides, pesticides and fertilisers have all been removed from the annual parks maintenance contract. Their use will be limited in future to such areas as bowling greens. Alternative methods for the control of pests and weeds will be sought wherever possible, either by manual operation or by alternative treatment. There will be no routine spraying of weeds in any of the Borough's parks and open spaces.

In 1991 there began a three year rolling programme of tree planting in the Borough's parks, covering twenty-nine separate locations. Examples are at Churchfields Recreation Ground, where it is hoped to recreate a typical woodland (like Chessington Wood) linked by informal hedgelines of native species, and at Latchmere Recreation Ground where it is proposed to recreate the Victorian style peripheral planting and follow this with a change in the mowing regime to allow informal meadows to grow around the edges of the sports pitches.

There is also the "street tree scheme" where the Council and community work together planting trees which enhance the visual appearance of the neighbourhood, attract birds and help reduce pollution. Residents commit themselves to caring for the trees.

There are six nature reserves in Kingston: Richard Jefferies Bird Sanctuary, Hill Wood Nature Reserve, Hogsmill Wood Nature Reserve, Edith Gardens Allotments, Kingshill Nature Conservation Area and Moor Lane Nature Conservation Area. (These form part of sites KI.BII 2, Ki.BII 7, Ki.BI 2, Ki.L 5, Ki.L1 and Ki.BI 5 respectively). The first three are managed under licence by the London Wildlife Trust, management tasks being carried out by local volunteers, whilst the latter three are managed by the Directorate of Housing and Leisure Services, although management work at Edith Gardens Allotments is also carried out by volunteers. Unfortunately none of the six reserves is generally accessible.

The Borough also contributes to the Lower Mole Countryside Management Project (see Chapter 6, *Nature conservation organisations in Kingston*) which helps to improve sites within the Green Belt for their conservation value as well as facilitating their amenity use.

Planning and development control

As statutory planning authority, the Borough is responsible for preparing development plans. These set out policies and proposals for the development and use of land including measures for the protection and improvement of the physical environment. They also guide the Council when considering planning applications.

The present Kingston Town Centre Local Plan and the Royal Borough of Kingston upon Thames Local Plan were adopted in April 1985 and May 1989 respectively and both will shortly be superceded by the Unitary Development Plan (UDP). The UDP is a borough-wide plan which incorporates both broad strategic land use and transport policies and more detailed local policies and proposals.

The deposit version of the UDP for the Borough proposes minor changes to the ecology policies contained within the

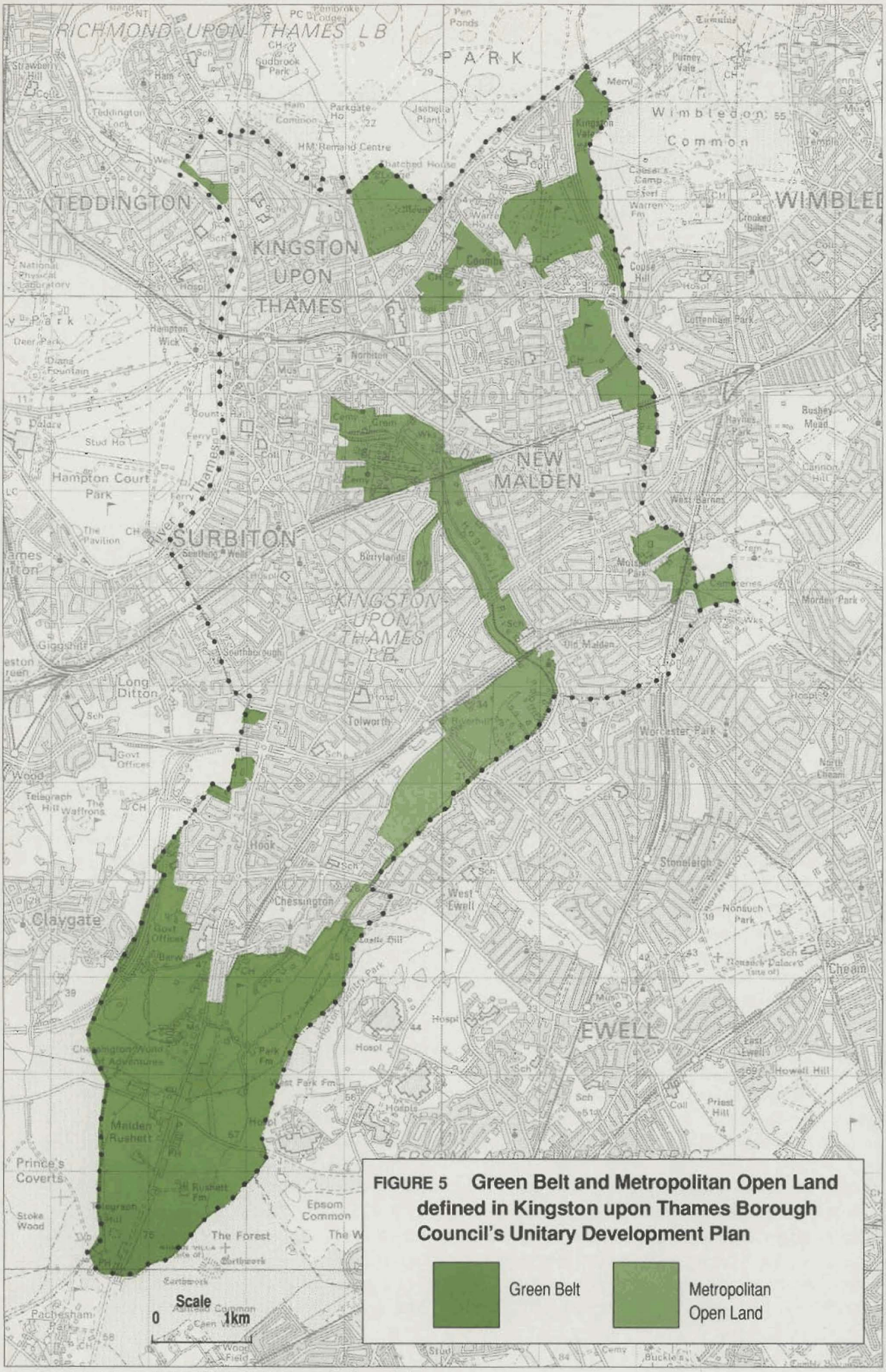


FIGURE 5 Green Belt and Metropolitan Open Land defined in Kingston upon Thames Borough Council's Unitary Development Plan

adopted Borough Plan. These policies seek to protect Sites of Special Scientific Interest (SSSIs) and other sites of nature conservation importance from development; these sites are marked on the proposals map accompanying the plan, and are based on the sites included in this handbook.

Specific policies in the new plan

Safeguarding Open Land

The open character of Green Belt, Metropolitan Open Land and other green corridors will be safeguarded and appropriate areas of open land will be managed for recreation and nature conservation.

Sites of Nature Conservation Importance

This is the main policy which protects sites of nature conservation importance against development and takes "the local ecological balance" into account when considering proposals on areas adjoining these important sites. Through this policy, the Council also seeks to promote:-

- a positive approach to the ecological management of land
- the provision of nature trails and other recreational facilities associated with nature conservation
- the protection of areas considered suitable as nature reserves
- the dissemination of information/advice on nature conservation matters.

Promotion of appropriate nature conservation sites for recreation

As well as protecting sites containing rare species or valuable habitats the Council also aims to protect important sites for their potential in meeting leisure, educational and social need.

Promotion of nature conservation management

A further policy states that the Council will enter into management agreements (under Section 39 of the Wildlife and Countryside Act 1981) where appropriate to conserve and enhance the natural beauty and/or amenity of land. The Council values its own land in the same way and is committed to manage it in terms of nature and landscape conservation. A series of environmental improvements are also undertaken when appropriate to maintain and enhance its nature conservation value.

Environmental improvements in the Green Belt

The Council's policy for Green Belt and Metropolitan Open Land refers to "nature conservation habitat including reserves and interpretation centres" as a defined acceptable use of such land.

The Council also participates in the Lower Mole Countryside Management Project and supports other initiatives to protect and enhance areas of local wildlife value. This work includes the retention, conservation and management of natural features including hedgerows, the promotion of appropriate use of derelict or neglected land, for example for nature conservation, the removal of rubbish and other eyesores, and planting and other landscape works.

Protection and enhancement of Hogsmill/Bonesgate Green Chain

A separate policy on the Hogsmill seeks to promote the Hogsmill/Bonesgate area as a Green Chain. Priority will be given to the enhancement of the public areas, improvements in environmental quality and recreational facilities, the retention of a substantial open area separating local communities, and the retention, conservation and enhancement of areas of ecological value and natural river features.

Expert advice on conservation matters within the Borough is obtained from the London Ecology Unit, the Wildlife Trusts and the Lower Mole Countryside Management Project.

5 Educational initiatives

The growing interest in ecology and related subjects over recent years, together with fears over global mismanagement, has led to increasing importance being placed on environmental education, both within the school curriculum and for the community at large. As an education authority, the Royal Borough of Kingston has a responsibility to ensure that the requirements for teaching this subject in schools are met.

The Council employs an Environmental Co-ordinator, together with an assistant, with a brief to boost awareness and aid related projects within the community. A programme of over 75 projects in which residents of Kingston can become involved is devised each year. These projects cover all aspects of the environment, such as recycling, energy conservation, landscaping and nature conservation, and serve as a means of community education. The Co-ordinator has, for example, acted as a focus for the Mayor's Tree Fund and organised litter amelioration campaigns, and runs a computerised free tree exchange. The latter enables people with unwanted saplings in their gardens to get in touch with those wishing to plant trees elsewhere in the Borough.

There is an ongoing poster competition, which encourages young people to think about these issues and to create posters about nature conservation, recycling and litter abatement. The best are published and distributed throughout the Borough.

The Borough mounts two large exhibitions each year, one for the National Environment Week celebrations in May, and one for the Environmental Pride Awards ceremony in November. These, together with a number of smaller specialist exhibitions, are also on display during the year at the Environment Centre and other venues throughout the Borough, including schools, churches, leisure and community centres, Council offices and business premises. These exhibitions provide information, reflect Council and community action, and encourage public participation in future events.

Other sections of the Borough Council are also making a contribution to educational initiatives in the Borough. In 1991 the Parks and Horticultural Service (also part of the Housing and Leisure Services Directorate) were granted funding for the first year of a three year rolling programme of tree planting at 29 locations throughout the Borough. At four of these locations, namely Churchfield and Latchmere Recreation Grounds, and Cromwell Avenue and Elmbridge Avenue Open Spaces, it is planned to involve nearby schools in the work, and to encourage them to make use of the site for nature study. A further five sites earmarked for improvements have also been identified as having educational potential.

The Borough's Youth and Community Service, which is part of the Directorate of Education, is also taking steps to improve awareness of the environment amongst young people in the Borough. In 1990 they produced a youth work curriculum for the guidance of their youth workers. It outlines six subject areas to be covered, one of which is "the environment". Expanding on this area of the curriculum, they have produced a leaflet which suggests ways in which youth workers can interest young people in this topic, and an attractive A3 poster consisting of a collage of "green" headlines and pictures, intended to promote discussion. Additionally, the Chessington Youth and Community Centre has been stocked with several books and publications, and two board games, with an environmental theme.

For adults of all ages, Kingston Adult and Continuing Education Service arranges a wide variety of day, evening and weekend classes throughout the Borough, including bird watching, conservation, and ecology.

In schools, the new National Curriculum stresses the use of environmental studies as a means of carrying out cross-curricular work (lessons linking several areas) for pupils of all ages. A recent HM Inspectorate report, *Environmental education from 5 to 16*, is strongly supportive of initiatives in this field at all levels. Other recent publications on the subject include the *Curriculum guidelines No 7 on environmental studies*, produced by the National Curriculum Council, and the London Ecology Unit's report *The development of environmental education in London* (Swales 1988).

At least 36 per cent of primary, 20 per cent of secondary, and one of the two nursery schools in the Borough have their own nature areas within the school grounds, or are in the process of establishing them. There are many advantages in having such areas within schools. The transport costs and insurance problems involved in taking children outside school are avoided. There is greater flexibility; lessons can be switched round in the event of bad weather, and work can be fitted more easily within scheduled lesson time. Long-term experiments can more easily be carried out, and can be regularly monitored by unsupervised as well as supervised pupils. Altogether, a nature area can be a very valuable asset to a school.

However, it is important to realise the limitations of school nature areas. They require a considerable amount of voluntary input from teachers and/or parents. Often the initiative is taken mainly or entirely by a single interested teacher, and sites may fall into neglect if this person moves to another school.

Maintenance of the site may depend not only on this teacher but also on the goodwill of grounds maintenance staff, whether direct services or outside contractors. The management of all school grounds will be put out to compulsory competitive tender. Special consideration will need to be given to developing appropriate specifications for managing nature areas and ensuring that contractors can supply staff trained in conservation management. School nature sites tend to be relatively small, and such areas can only give a limited understanding of the diversity of the natural environment. They only complement field trips to larger, more diverse sites, and should not be used as a substitute for gaining experience of rural landscapes.

The Surrey Wildlife Trust provides field courses for schools at their educational nature reserve near Leatherhead (Nower Wood Educational Nature Reserve), as does Snuff Mill Environmental Centre in the contiguous London Borough of Merton. Other local areas of nature conservation interest that are visited by Kingston schools include Box Hill, Epsom Common, Headley Heath, the River Mole at Dorking, Richmond Park and the River Thames.

In 1991 plant life along the Hogsmill River was photographed and catalogued by a local botanist for the Environment Centre, and slides are available on loan to schools and youth groups for projects. An exhibition has also been mounted and can be seen at venues throughout the Borough.

The Borough organises Environmental Pride Awards annually, and two of the categories are "best private nature garden" and "best school nature garden". The best school garden in 1990 was opened to the public and the children acted as guides to show visitors around, with a view to encouraging people to take similar steps in their own gardens or school grounds. In the same year an open day was held in the best private garden for head teachers of local schools so that they could discuss ways and means of creating and managing nature conservation areas.

The Environmental Co-ordinator, together with volunteers, visits schools within the Borough to provide advice and to help with individual projects. Many schools have obtained grants from a number of sources to carry out practical work in the school grounds, for example English Nature's Schools Grant Scheme. The London Ecology Unit also gives advice on the design and management of school sites.

School nature areas may vary from elaborately designed gardens to tiny patches of rough grass and "weeds" tucked away in a corner. All are of value to teachers and children, and all present different challenges and problems to those responsible for maintaining them. The following schools are amongst those who have expressed a willingness to allow other local schools to visit their nature areas: Buckland Infants, Christ Church Primary, Coombe Hill Junior, Holy Cross Convent, Malden Manor Primary, Moor Lane Junior, Our Lady Immaculate Roman Catholic Primary, St John's Church of England Primary and St Matthew's Church of England Primary. All would need to be given advance notice of a planned visit. Several very different examples of Kingston schools with nature areas are described below.

There is one very unusual garden, which does not really fit into any category. An award winning private garden (Kingston in Bloom competition) has been created without the use of chemicals and pesticides, and is totally organic. Kingston's Environmental Co-ordinator liaised with the owner (Mrs Pat Cooper) to open the garden to the public and as a school resource.

Examples of school nature areas in the Royal Borough of Kingston

Fairfield Nursery School
Fairfield East, Kingston upon Thames

This small nursery school for three to four year olds has developed two small borders of plants beneficial for wildlife, which are at right angles to each other. In the corner of the right angle is a little patch of rough grass where the children have dug a small pond.

The pond harbours frogs and yellow flag. In the borders, the children have planted such species as foxgloves, Welsh poppies, pyracantha and buddleia. A stand of Oriental poppies has self-seeded. There are also strawberries, potatoes, and cherries from a nearby tree, which the children love to harvest and eat.

The school received a grant from the Borough's Science Unit with which they purchased small tools and some shrubs. All other plants and materials have been donated.

The head of the school emphasises that as the children only stay for three terms on average, she likes to give them small complete projects connected with the nature area to carry out, for example planting bulbs, or visiting other places to collect old logs. The next small project planned is to build a stone pile.

Although the area is very small-scale, it is frequented by some interesting fauna. Blue tits and thrushes have nested, goldfinches visit to feed, and a pair of toads resides in a damp patch near a leaky drainpipe.

Although older children from a nearby school use the site as a short cut home, vandalism has not been a problem, probably because the area is so small and unobtrusive.

Buckland Infants' School
Buckland Road, Moor Lane, Chessington

Buckland Infants is a newly built school, located in an area of open land which was farmed until quite recently, but is now hemmed in by housing estates. An old, overgrown hedgerow crosses the school site. It contains oak, ash, elm, hawthorn, blackthorn, hazel, dog rose, elder and bramble.

With so many species, it is almost certainly quite ancient in origin.

In 1989 it was decided that the hedge could be used as a focus for a school nature area. Much rubbish had been dumped in the hedge, and both children and parents put in much hard work clearing this away. The clearance work left a hollow area in the centre of the hedge, which has now been developed as a walkway, completely enclosed by hedge plants so that one has the sensation of walking through a green tunnel. Wrens and robins have nested in the hedge and signs of foxes have been seen.

Other additions have been an unusual, large, octagonal, wooden seat, donated to the school some time ago and labelled "For children only", and the introduction of log piles.

More recently, the school has been given a grant by the Borough to enable it to buy fencing materials. The new fence encloses a portion of the playing field adjacent to the hedge. The area will be left unmown for part of the year to encourage wild plants to flower.

The nature area is intensively used for lessons, and for projects such as a soil survey and a study of rubbish deterioration.

The nature area has not been without its teething troubles. One summer holiday the school, and some builder's supplies, were vandalised by children using their booty to build dens in the hedge. However, the nature conservationists at the school are not deterred. Plans are now afoot for a future wild flower growing area and a butterfly garden.

Latchmere Junior School
Latchmere Road, Kingston upon Thames

Latchmere Junior School has developed the most wonderful nature area, which other schools considering such a scheme would do well to visit and learn from.

Work began in earnest in September 1988 on a 600 square metre area of waste ground formerly used for indiscriminate dumping. The first step was to surround the area with a strong fence and clear away the rubbish. The planting then began and resulted in a butterfly area, herb garden, woodland and nettle area, log piles, marsh, pond, meadow, dry stone wall, vegetable garden, and compost bins. The pond was dug by hand by the children. At one stage, a pickaxe had to be brought in! A colourful bee garden is a more recent addition.

By June 1989, just nine months later, the school was ready to hold its first Conservation Area open day. The letters of invitation acknowledged the widespread help and support the project had received from parents, local businesses, the Nature Conservancy Council (now English Nature) and the Borough.

The area is home to a host of delightful wild flowers, such as cornflower, knapweed, meadow-sweet, purple loosestrife, monkey flower, and spiked water-milfoil (also known as parrot's feathers), to name but a few.

The first stages of the project were largely masterminded by one teacher, who has since left the school. Fortunately, another equally keen teacher has now taken over. She has founded a "Conservation Club" for fifth year children which meets after school. She comments that the conservation area seems to cast a spell over the children, and even the most unruly children quieten down and become absorbed by the fascinating wildlife.

The school's miraculous creation has not gone unnoticed: it has won the Borough's *Environmental Pride* award two years running.

The school is now embarking on another ambitious project to make the school playground more stimulating and "environmentally friendly". They have produced detailed designs, plans and costings, and the research work has already won third place in the World Wide Fund for Nature's *Environmental Enterprise Award Scheme* for the seven to eleven age group.

St Andrew's and St Mary's Church of England Junior School, Maple Road, Surbiton

At St Andrew's and St Mary's, a small square fenced area marooned in the middle of the playground has been allowed to develop as a conservation area over the last three years.

The children have planted new species, and others have seeded themselves naturally. There are patches of poppy, corn marigold, hollyhock, red campion, mugwort, mallow, thistles and mullein. There is also a small pond and a bird table. The remaining area is taken up with long grass and nettles. In and around the playground stand mature sycamore and lime trees, which add to the wildlife value of the school grounds as a whole. The actual conservation area is currently rather exposed and it is hoped to plant native shrubs beside the metal fence in the future.

Holy Cross Convent (Secondary) School
Sandal Road, New Malden

Holy Cross Convent School possesses a rich, ready-made conservation area in a piece of spare ground sandwiched between the playground and adjoining houses.

Between the conservation area and the playground grows a rampant hedge of mature oak trees, lime and elder. A large, mature ash tree presides over the centre of the area. A tangle of different wild plants covers the ground, such as ivy, bramble, scarlet pimpernel, cleavers, honeysuckle, thistles, buttercups and mallow, with small patches set aside for the growing of herbs and vegetables. Elsewhere in the school grounds is a pleasant pond area. Goldfish swim in the pond, which although rather formal is still, of course, of some value for wildlife.

6 Nature conservation organisations in Kingston upon Thames

There are many voluntary organisations active in the Borough which have roles to play in protecting and managing wildlife sites and making them available for people to enjoy, promoting nature conservation, care for the environment and the study of natural history. Some relevant addresses are contained in Appendix 1.

The oldest purely local voluntary group concerned with nature conservation within the Borough is the **Surbiton and District Bird Watching Society**, set up in 1954. The activities of this group include bird ringing and study at the Hogsmill Valley Sewage Works.

Two Wildlife Trusts are active in Kingston, the **London Wildlife Trust** and the **Surrey Wildlife Trust**, but only the former is directly involved in the management of sites in the Borough. In 1980/81 the Kingston Group of the Surrey Wildlife Trust, together with the Surbiton and District Bird Watching Club, carried out a survey of the wildlife along the Hogsmill and its tributaries. The London Wildlife Trust, which has an active local group, manages three small nature reserves in the north of Kingston, under management agreements with the Borough. The **Kingston Conservation Volunteers**, affiliated to the **British Trust for Conservation Volunteers**, also regularly carry out practical conservation tasks in the Borough.

The Green Belt in the south of the Borough comes within the area of the **Lower Mole Countryside Management Project** (LMCMP), an urban fringe project funded by the Countryside Commission and five Local Authorities, including Kingston. In Kingston its work has included surveying the 19 kilometres of public rights of way found in the Green Belt, combined with carrying out substantial improvements on the footpaths and bridleways to improve public access to the countryside. Extensive hedge and tree planting has been initiated on Rushett Farm and Castle Hill and survey and woodland management work has been undertaken in Sixty Acre Wood.

In the Malden Rushett area, three Second World War pill boxes have been converted by the LMCMP into bat roosts. Currently they are planning to involve the local community in the management of Jubilee Wood and restoration of the neglected pond adjacent to Chessington Wood. A circular countryside walk in the attractive countryside around Chessington has recently been implemented. They are also keen to see a full survey of the hedgerows and hedgerow trees of the Borough, as well as management work on Winey Hill, which would enhance the nature conservation value of the area. The Project is committed to involving the local community in countryside management and runs mid-week and weekend projects for volunteers. Work experience people from local schools often work with the Lower Mole Project during the year.

The London-wide group, the **London Natural History Society**, has been active in the Borough in recording its natural history, and is currently involved in mapping the distribution of moths and breeding birds throughout London. The London Natural History Society produces a range of publications, including the annual *London Naturalist* and *London Bird Report* and distribution atlases for various groups of plants and animals (eg Montier 1977, Burton 1983, Plant 1987).

Part Two

7 Deciding which sites are important

The decisions leading to the selection of sites described below were based on criteria outlined in Ecology Handbook 3 *Nature Conservation Guidelines for London* (Greater London Council 1985) as subsequently revised in the report *Sites of Metropolitan Importance for Nature Conservation* (London Ecology Unit 1989). Sites have been graded into Metropolitan, Borough and Local sites and their locations are shown in figure 7 inside the back cover. (More detailed information on site boundaries may be obtained from the London Ecology Unit). In addition Green Corridors are mapped in figure 6.

Sites of Metropolitan Importance

Sites of Metropolitan Importance for nature conservation are those sites which contain the best examples of London's habitats, sites which contain rare species, rare assemblages of species, important populations of species, or which are of particular significance within large areas of otherwise heavily built-up London.

They have the highest priority for protection. The identification and protection of Metropolitan sites is necessary, not only to support a signficant proportion of London's wildlife, but also to provide opportunities for people to have contact with the natural environment.

Kingston contains all or part of six Metropolitan sites. Coombe Hill Golf Course is the only site completely within the Borough boundaries, and supports ancient woodland and heathland. The majority of Sixty Acre Wood, another woodland of unusual species-richness, lies within the Borough. Only fragments of the remaining four sites, namely Richmond Park, Wimbledon Common, Ham Lands and the River Thames, lie in Kingston.

In the text, Metropolitan sites are identified by the prefix M, followed by a number taken from a list of sites identified over the whole of the Greater London area. Sites of Metropolitan Importance are not therefore numbered consecutively within the Borough.

Sites of Borough Importance

These are sites which are important in a Borough perspective; damage to these sites would mean a signficant loss to the Borough. Borough sites are divided, on the basis of their quality, into two grades, but it must be stressed that they are all important on a Borough-wide view. In Kingston nine sites

FIGURE 6 **Green corridors through Kingston upon Thames**

of Borough Grade I quality have been identified and fourteen of Borough Grade II status.

Sites of Borough Importance are identified by a Ki. (for Kingston) and B (for Borough) prefix, followed by their grade (I or II), and then a number taken from a list of sites for the Borough.

Sites of Local Importance

A Site of Local Importance is one which is or may be of particular value to nearby residents or schools. These sites may already be used by schools for nature study or run by management committees mainly composed of local people.

Local sites are particularly important in areas otherwise deficient in nearby wildlife sites. Built-up areas more than one kilometre from an *accessible* Metropolitan or Borough site are defined as Areas of Deficiency. Local sites are chosen as the best available to alleviate this deficiency. Where no such sites are available, opportunities should be taken to provide them by habitat enhancement and creation, by negotiating access and management agreements, or by direct acquisition.

Two major Areas of Deficiency have been identified in Kingston. The largest forms a broad swathe across the northern end of the Borough. Starting in the west at Norbiton, it stretches east to New Malden, turning south at the Borough boundary to include Motspur Park. The second large Area of Deficiency extends along Hook Road to the north-west of Chessington. Few Local sites could be found to alleviate these areas and so a search for sites suitable for habitat creation should be a priority.

Nine Local sites have been identified in Kingston.

Green Corridors

Green Corridors are relatively continuous areas of open space leading through the built environment which may link sites to each other and to the Green Belt. They often consist of railway embankments and cuttings, roadside verges, canals, parks, playing fields and rivers. They may allow animals and plants to penetrate further into the built-up area than would otherwise be the case and provide an extension to the habitats of the sites which they join.

Green Corridors in Kingston (figure 6) constitute a network which links the centre of the Borough with the extensive areas of Green Belt land in the south. The most important corridor follows the Bonesgate and Hogsmill valleys from the Green Belt north and then west to link with the Thames in Kingston town centre. Another wide corridor extends north along the western edge of the Borough to Long Ditton. Another corridor further north follows the Thames far into central London. This, and thin corridors along the British Rail lines in the Borough, link with Richmond Park and Wimbledon Common through other large open spaces in the north-east of the Borough. These corridor links continue further into the London Boroughs of Richmond, Merton and Sutton.

Areas of land in Green Corridors should be managed in a way that is compatible with wildlife. This includes the areas which are outside nature conservation sites listed in this handbook, if this is compatible with their primary functions of agriculture, recreation or other open space. Conversion to hard surfaces should be discouraged, and where features such as railways and roads cut across the corridor, provision should be made to allow the safe passage of wildlife and pedestrians.

Sites in neighbouring Boroughs and in Surrey

Sites within the Royal Borough of Kingston are of value to people in neighbouring boroughs. In turn, as shown in figure 7 inside the back cover, and as listed on page 82, there are several sites in the adjacent areas of neighbouring London boroughs and in the County of Surrey which are important to Kingston.

An index of all the sites in Kingston described in this handbook is given on page 92, facing the inside back cover.

8 Sites of Metropolitan Importance

M31 The River Thames and Islands

Length in Kingston 4.4 kms
See map on page 28

The River Thames forms 4.4 kilometres of the Borough boundary and, since this stretch is upstream of Teddington Weir, is non-tidal here. It is of great conservation value because of its plant communities, waterfowl, freshwater fish and invertebrates. Although much of the Thames-side in Kingston is built-up, pockets of riverside vegetation still survive and some interesting species can be found here.

The town of Kingston is situated close to the first practicable ford across the Thames upstream from the sea. It is reputed to be the spot where Caesar crossed the Thames when pursuing the Britons under Cassivellaunus. The river has yielded many archaeological finds, providing evidence of people being present here since prehistoric times.

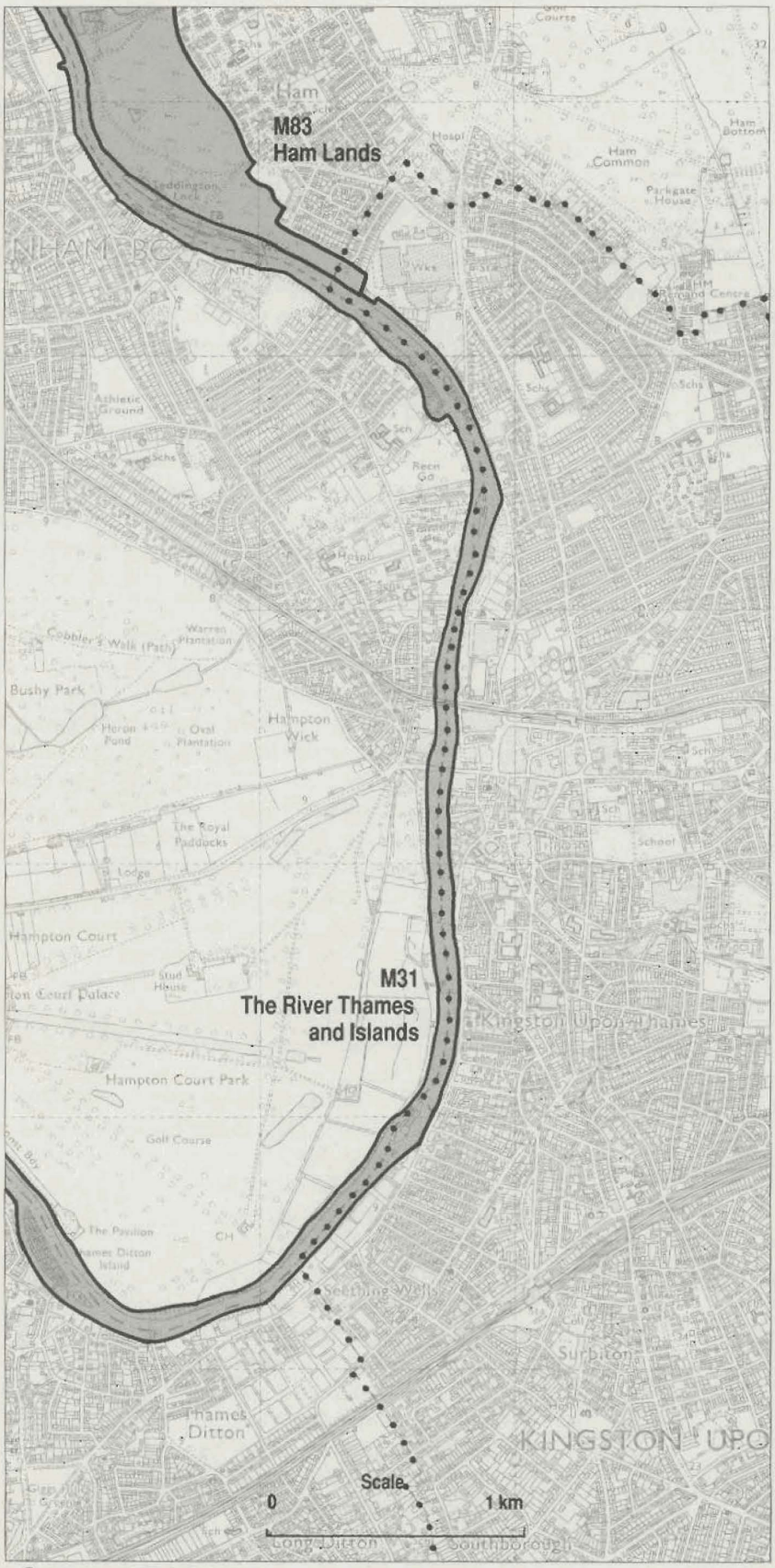
The most interesting bankside vegetation is downstream of Canbury Gardens and upstream of the British Aerospace factory. Here Lower Ham Road runs alongside the river, and between this and the water is an intermittent strip of lush bankside vegetation, one to three metres wide. Plants have anchored their roots partly on natural river bank and partly in cracks in the stone facing. Several of these species, such as hemp agrimony, sweet flag, marsh woundwort, great water dock and lesser pond-sedge, have a restricted distribution in the London area. On a quiet summer's day this section of the bank is a pleasant and colourful sight from the river. The creamy-white flowerheads of meadow-sweet and the tall stems of great hairy willow-herb, with their carmine flowers, loom over stands of yellow flag closer to the water's edge. Trifid bur-marigold, which also grows here, though not a man-eater like its science-fiction namesake, produces fruit with backward-pointing spines, designed to catch in the fur (or socks!) of passing animals – a successful method of dispersing the next generation of this yellow-flowered member of the daisy family. On the slightly drier areas, other members of the daisy family can be found such as tansy, coltsfoot and mugwort, together with persicaria, silverweed and bindweed. Two plants belonging to the carrot family are also fairly frequent along the river bank: wild angelica, with its white, flat-topped flowerhead supported beneath by radiating stems like the spokes of an umbrella, and the superficially similar hemlock water dropwort. The stems of angelica can be candied for cake decorating whilst in contrast the hemlock water dropwort is deadly poisonous. Gipsy-wort, water mint and reed-grass are additional damp-loving plants to be found on the wetter areas. The road and buildings to the east of the river are screened from it in parts by scattered trees including crack willow and alder.

Downstream from Lower Ham Road, towards Teddington Weir, the bank is steeper, trees become more plentiful, with sycamore and ash as additional species, and the aquatic plants are largely replaced by grasses and wild flowers often associated with dry or disturbed ground, such as wall barley, barren brome, lop-grass, smooth-stalked meadow-grass, common vetch and common mallow. Meadow-sweet and yellow flag are examples of the more damp-loving plants found here. As the path draws near to Ham Lands (site M83) and the boundary with Richmond upon Thames, the grassy patches beside the river contain more crow garlic, together with other grassland species including barren fescue, sheep's sorrel, meadow vetchling and fescues. Tall, magenta spikes of purple loosestrife can be seen in places at the water's edge.

At Canbury Gardens, a fairly formal riverside park, a rocky river edge supports common figwort, gipsy-wort, broad-leaved dock and common skull-cap, as well as the odd garden escape such as lemon balm and alkanet. Aquatic bankside vegetation persists even into the centre of Kingston on small beaches among the boatyards, where additional species include amphibious bistort and, below the water, horned pondweed. The latter is a plant of restricted distribution in the London area.

Most of the remaining shoreline in Kingston consists of vertical or near-vertical concrete walls but, even here, cracks support a few tolerant aquatic plants such as gipsy-wort and "rockery" plants such as stonecrop and pearlwort. Alongside Queen's Promenade there are extensive beds of yellow water-lily, but they rarely flower there. The river's edge along the Promenade shows more interesting plants than one would at first expect. Common skull-cap, orange balsam, corn salad and wild clary, the latter two of which are rare natives in London, can be found by those willing to search.

The two islands, or *aits*, in Kingston are largely covered with buildings associated with boating, and the only vegetation consists of trees, including crack willows, and managed grass-land. In bygone days these islands were used to grow the willows or sallys to supply many of the basket-makers of London.



Breeding waterfowl on this section of the Thames include great crested grebes, mallards, tufted ducks, Canada geese and coots. Although most species seek out the remaining wild stretches of river bank, coots and great crested grebes nest and rear their young within a few metres of the concrete-lined promenades. Since their general decline, mute swans no longer breed here, but a few birds are present throughout the year. Outside the breeding season the numbers and variety of waterfowl is greatly increased by birds coming mainly from colder climates. Black-headed gulls from the Baltic arrive in July and stay until spring. Cormorants from colonies around the Irish Sea fish on the river throughout the colder months, and a range of ducks can be seen, particularly in cold weather when some of the reservoirs of west London may freeze over. At these times flocks of goldeneye, tufted duck, pochard and goosander join the ubiquitous mallard.

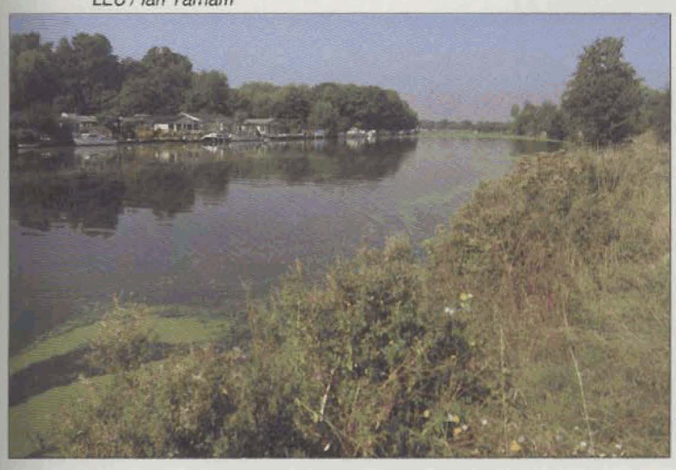
The Thames contains a diverse population of freshwater fish typical of the lowland reaches of a river. Roach, dace and bleak dominate, and bream, tench, carp, perch and pike are abundant. These species spawn among the water-lily beds, which swarm with fry in the summer months. Since the cleaning up of the lower Thames, migratory fish have once more been able to colonise, although Teddington Weir still presents a formidable barrier. Salmon and sea trout now occasionally penetrate this far, and eels, which have always existed in the Thames and can migrate overland, occur in increasing numbers.

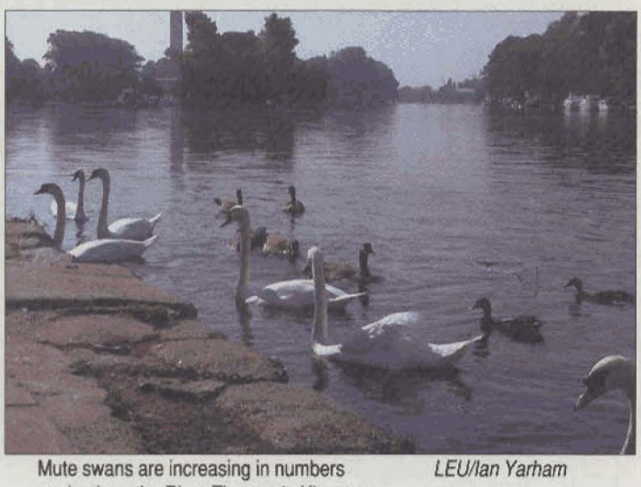
Most of the bankside up to the water's edge is managed by the Council as formal or informal parks, while the river is managed by the National Rivers Authority.

LEU / Julie Brownbridge
Children enjoy pond dipping
at Latchmere Junior School

Typical countryside in
Kingston's Green Belt
LEU / Meg Game

The River Thames just north
of Lower Ham Road
LEU / Ian Yarham





Mute swans are increasing in numbers
again along the River Thames in Kingston

LEU/Ian Yarham

Management should aim to maintain existing aquatic vegetation and, wherever possible, enhance the possibilities for the establishment of more vegetation, which provides essential cover and food for the fish and some of the waterfowl. Use of weedkillers along the river's edge should be reviewed and stopped if at all possible.

There is public access to much of the river, but a gap exists in the walkway in central Kingston. Access is available across the river beside Hampton Court Park upstream of Kingston Bridge.

M82 Richmond Park

Grid ref TQ 195 710
Area 950 ha (45 ha in Kingston)
See map on page 33

Only the southernmost tip of Richmond Park lies within the Borough, driving a triangular wedge over the boundary. The vegetation of this triangle is typical of much of the unenclosed parkland found in the Borough of Richmond upon Thames, consisting of acid grassland with open oak woodland and a small pond. The following description covers the area within Kingston's boundaries. For a full description of the whole park see *Nature Conservation in Richmond upon Thames*, a later handbook in this series.

Richmond Park was enclosed by King Charles I in 1637 as a hunting park for his private use – bitterly but futilely opposed by the landowners. Much of the area wanted by the king consisted of waste ground, commons and some Crown lands, but nearly half belonged to local people, and when they refused to sell, the king ordered work to start on the building of the enclosure wall as a strong hint of his intention to have his own way.

At the time of the enclosure, the park was known to contain some 1500 deer. In fact, deer grazed the site long before Henry VIII spent many an hour hunting there. Grazing has been the land use here for centuries and continues to the present day. Now, both red and fallow deer can be seen wandering in herds through the grasslands and woods. In 1970 there were 600 deer, 350 fallow and 250 red. Red deer are native to northern and western Britain and are the largest truly wild animals to be found across most of central and western Europe. Their coats are a reddish-brown colour, becoming paler towards the belly. Fallow deer are slightly smaller and were originally native to woodlands of the Mediterranean. They were reputedly introduced to this country by the Romans, but archaeological evidence suggests a later introduction in the Norman Period. Fallow deer have been selected for attractive colours and their coats can now vary from nearly black to milky white. The normal form, however, has a bright chestnut coat with white spots in summer, which changes to a drab grey-brown in winter. These beautiful animals are normally shy and easily disturbed, but during the rutting season they can be dangerous. Hence, when visiting Richmond Park, the deer should be admired at a distance, to cause as little disturbance as possible.

At the beginning of the 19th century a great many domestic animals were kept in the park. In 1806, for example, 400 sheep, 300 lambs and 89 cattle and oxen roamed the woodland and grassy spaces.

Gallows Hill, approached from below by the A308 (Kingston Hill), earned its name because the gallows stood for some years between the high road and Richmond Park wall, after being moved from its original site in Surbiton.

As one enters by the Kingston Gate, thick belts of woodland lining the walls stretch diagonally to left and right, whilst straight ahead closely-cropped acid grassland lines the slopes, undulating up to the hilltop. A spur of woodland, beginning at the south-east boundary, clothes the ridge northwards to Thatched House Lodge.

During the summer, the vast areas of acid grassland turn a reddish-purple hue with the delicate flowers of common bent-grass and fiorin. These are joined by red fescue, sheep's sorrel and common storksbill. On the flatter southern slopes, many ant hills can be seen, and on hot summer days grasshoppers chirrup and leap in all directions as you approach, landing silently, only to leap again with your next footfall.

Nestling in a hollow of these grass-covered slopes lies Gallows Pond, roughly circular in shape, its shallow waters revealing a muddy bottom beneath. The water's edge is fringed with hard and jointed rushes interspersed with traces of flote-grass, star-wort and hammer sedge. The water itself is poorly colonised with a few strands of Nuttal's pondweed, but water boatmen, pond snails and the occasional pond skater

can be spotted here. Damselflies, with their colourful, thread-like bodies, perch amongst the rushes.

The slopes to the north and east of the pond grade into bracken before reaching the trees of the woodland spur. Oaks are the commonest trees, many of them of a venerable age, the oldest having survived long enough to predate the park's enclosure nearly 400 years ago. These fine old trees are well worth searching for. Their enormous trunks are gnarled and twisted into fantastic shapes and one specimen has been so split and contorted that daylight can be seen through it. Beneath these trees, deer-grazing and heavy public use has removed any shrub layer that may once have existed. In places, particularly on the slopes, the soil and gravels have been exposed, leaving channels looking like the scars of ski runs in summer. Less heavily-used areas under the trees support some of the commoner acid grassland species mentioned above, together with sedge, heath rush, lesser stitchwort, common tormentil and hard rush.

At the top of the hill, trees and bracken give way to a flat grassland plateau. Here and there groups of trees have been planted relatively recently, including a grove of silver birches and the "King Clump". Some exotic trees, such as Japanese larch, false acacia and gum trees, have also been planted at various times. A curious flat base to the canopy of the woodland is a tell-tale sign of heavy browsing, as it is just beyond the reach of the tallest deer.

Under the cool shade of the oak-dominated woodland, along the eastern boundary of this section of the park, is a series of drainage channels which contain several water-loving plants. The wettest parts of these channels support star-wort, flote-grass and ivy-leaved water-crowfoot. The latter has tiny, white, cup-like flowers with a yellow centre and is now a rare plant in London due to the loss of its habitat. In slightly drier areas, large bitter-cress and hard rush are common, while the steep banks provide ideal conditions for carpets of mosses and leafy liverworts. Cracks and crannies in the banks provide footholds for male fern and broad buckler-fern and the odd seedling of oak, beech and holly – the steepness of the banks providing the necessary shelter to keep grazing deer away.

The size and variety of habitats in Richmond Park leads to a varied bird fauna that includes rural species such as the partridge, cuckoo, little owl, tree pipit and redstart, many of which breed here at their closest location to central London.

Richmond Park is a Royal Park, managed by the Department of the Environment. There is unrestricted access to the sector lying within Kingston during daylight hours, via Kingston Gate or Ladderstile Gate. English Nature has recently designated much of the park as a Site of Special Scientific Interest, the only such site in Kingston.

M83 Ham Lands

Grid ref TQ 174 713
Area 80 ha (4.9 ha in Kingston)
See map on page 28

A small corner of the extensive grass and scrubland site of Ham Lands extends south into Kingston from the adjoining Borough of Richmond upon Thames. In isolation, the Kingston section would not be of Metropolitan Importance, but it is an integral part of the larger complex. A boundary stone at the top of the bank above the tow-path marks the Borough boundary, although this is usually even more clearly marked by the abrupt change from long grass on the Richmond side to close-mown grass on the Kingston side. The Kingston fragment of the site comprises riverside grassland with a few bushes and trees, lying between the Thames tow-path to the south-west, housing to the north, and the grounds of the British Aerospace factory to the south-east. For a full description of Ham Lands see the handbook in this series on the Borough of Richmond upon Thames.

Along the river side of the tow-path there is a row of alder trees, where siskins and redpolls can often be seen feeding in winter. The banks of the river are colonised by common aquatic plants (see description of M31, The Thames). From the tow-path the land slopes up as a steep bank to the level grassland which forms most of the site. The vegetation of the unmown bank is dominated by a range of common grasses, including oat grass.

The remaining grassland is mown regularly. Amongst the grasses can be found wild flowers such as crow garlic (with its globular flower heads and strong onion smell), sorrel, yarrow, chickweed, cow parsley, white deadnettle, goat's-beard and hardheads. Tansy, with its yellow, button-shaped flowers in clusters, can also be found here. In olden times it

LEU / Meg Game
An impressive old oak near Gallows Pond in Richmond Park

Winter outlines on the Kingston part of Wimbledon Common
LEU / Ian Yarham

Gallows Pond in Richmond Park, seen in late summer
LEU / Meg Game

Heather borders some of the fairways on Coombe Hill Golf Course
LEU / Jeff Edwards

was used as a "strewing herb", scattered over floors as an early form of air freshener because of its pungent, camphor-like smell. Wild flowers are more abundant and more species are present in the neighbouring grassland across the boundary in Richmond, where the grass is cut later in the year. One late cut (late August/early September), with removal of the clippings, on the Kingston side would enable more flowers to set seed and thereby ensure their survival and spread. Pathways could, of course, be kept closely mown. A row of tall hawthorn bushes traverses the site, many of which are covered with the trailing vines of white bryony.

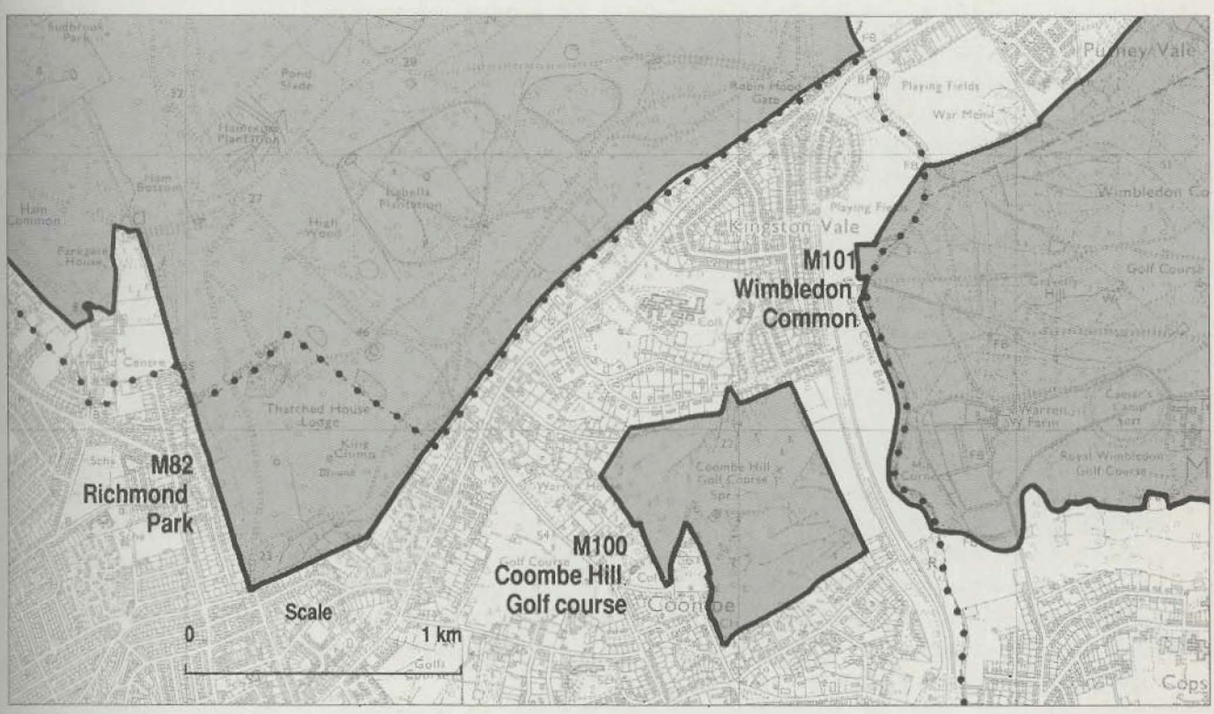
The tow-path and grassland have unrestricted public access and form a very popular riverside walk. The tow-path is also much used by anglers. The whole of the site is designated as Metropolitan Open Land, and the section in Kingston is owned by the Directorate of Housing and Leisure Services.

M100 Coombe Hill Golf Course

Grid ref TQ 210 707
Area 50 ha

The outstanding wildlife value of this golf course lies particularly in its small remnants of heathland and acid grassland. Heathland is one of the rarest and most threatened habitats in England, and especially in the London area. The conservation value of the golf course is further enhanced by extensive tracts of woodland composed mainly of native trees and shrubs.

The golf course spreads over the eastern slopes of Kingston Hill, a ridge of high land between the Thames and Beverley Brook. The summit of the hill is composed of acidic gravels belonging to the High Level Terrace and Claygate Beds. Outwash from these formations renders the soils poor and acidic over much of the site, except for the low-lying north-eastern third, where richer soils overlie London Clay.



The geology of the site is reflected in the composition of the present-day vegetation and in past land use. On the land use map of London produced by Milne at the end of the 18th century, the bottom of the valley, on the richer, wetter soils, was depicted as a forest known as Coombe Wood, whereas the top of the hill on poorer soils was shown as common land, presumably grazed heathland, called Coombe Warren. Rabbits would have been kept here. In 1852, Bidens recorded that parts of Coombe Hill had been brought into cultivation, and this is borne out by the presence of field boundaries on the site. From the late 19th century, Coombe and Kingston Hills became a desirable area for people to build the grandest of mansions standing in their own ample grounds and which could be reached comfortably by driving from London, yet furnished all the rural pleasures of Surrey. This was the setting for the *Forsyte Saga* by John Galsworthy.

Several springs arise on Coombe Hill. These provided the original water supply for Hampton Court. Conduit houses were built at the source of the springs and the supply was taken under the Thames by an impressive series of pipes.

The heathland forms isolated patches in the rough beside some of the fairways, and particularly where local topography renders close mowing difficult. The heather can be seen from afar as dark, brownish-green shadows amongst the brighter grasses, which line the manicured fairways. None of the heather patches is more than a few hundred square metres in extent. Although common heather is the dominant species, there is one small patch of bell heather, with its larger, deep pink-purple flowers. All the heather appears to be even-aged and relatively young, and in most places is mown to a height of about ten centimetres. A recently-excavated pit near the centre of the course (at the top of the hill) forms a heather-lined basin, pink with flowers in August and alive with bees and grasshoppers, despite the golf balls sailing overhead in lethal parabolas.

Most of the fairways have been re-seeded and fertilised, but grasses and wild flowers characteristic of dry acid soils can be found amongst the heather patches and form more extensive tracts along the edges of the fairways. These acid grassland species include mat-grass, with its thin, blue-black, one-sided flower-spike resembling a saw's edge, and purple moor-grass, which has blue-green leaves tapering to a sharp, purple-tinged point. Both these species are now restricted in London to a few of the more intact heathland and acid grassland sites. Commoner grasses of this habitat type, such as wavy hair-grass, early hair-grass, fescues and bent-grasses, make up most of the sward. Other plant species of heathlands and dry grasslands which are present and have a restricted distribution in the London area include creeping willow, birdsfoot, parsley-piert, common tormentil (one of only two species of the cinquefoil group to have four petals rather than five - thus resembling a tiny, yellow Maltese cross), mouse-ear hawkweed, heath bedstraw (another flower with four petals, but these are creamy-white, smaller and arise from a plant with whorls of tiny, spike-like leaves), heath rush and oval sedge. Other less restricted species such as sheep's sorrel and cat's ear are also present.

A number of small ditches cross the golf course, draining north and north-east towards the Beverley Brook. Along these moss-lined ditches and in other wet places, lesser spearwort, jointed rush, lesser skull-cap, ragged robin and remote sedge can be found.

The fairways are separated by long strips of dense woodland, giving each ribbon of grassland the impression of being an enclosed glade. The woodland roughs are up to a hundred metres or more wide, and in the Nature Conservancy Council's *Ancient Woodland Inventory*, ten hectares of them are considered to be ancient semi-natural woodland, some of the last remains of the Coombe Wood of old. Oak is the dominant tree species, with smaller amounts of birch, pine and sycamore in the canopy. The latter two are more recent arrivals. Some of the woodland roughs consist of tall oak standards beneath which rowan and holly are the main understorey species but elder, goat willow and increasingly rhododendron also find a place here. The latter species is an invasive, non-native shrub which is taking over much of the woodland on the higher land. Control measures should be taken against this weed, as it swamps the ground flora, chemically changes the soil to prevent other species taking root and spreads rapidly. In some of the more recently planted strips, pine dominates, sometimes with broom beneath. In summer the ground layer of the woodland strips consists largely of a tangle of bright green bracken fronds and bramble, beneath which the remains of the spring's bluebells (now a pale papery-brown colour) together with creeping soft-grass, wood sage, foxglove and yellow pimpernel can be found by those intrepid enough to push their way through the dense undergrowth.

The areas of heather on the golf course have shrunk over the last few years and sensitive management will be required to maintain or enhance the wildlife value of the remaining heathland and acid grassland. This need not conflict with management of the site as a golf course, and could even improve the already considerable landscape value of the site.

Although the golf course is owned by the Borough, it has no role in the management of the heathland and the acid grassland, which is the responsibility of the golf club. Access is restricted to golfers but the general public need not be denied a sight of heathland in the area since there is free access to expanses of heather (most impressive in August) on nearby Wimbledon Common, in the Boroughs of Merton and Wandsworth.

M101 Wimbledon Common

Grid ref TQ 216 717
Area 415 ha (4.9 ha in Kingston)
See map on page 33

Wimbledon Common is London's finest example of heathland, with extensive areas of acid grassland, secondary woodland, damp heath and one fine bog. It contains the second largest Site of Special Scientific Interest in London, and although the SSSI lies wholly in the Boroughs of Wandsworth and Merton, a small part of the common, on the western side of the Beverley Brook, is in Kingston. The following description concentrates only on the area in Kingston. This consists of a lens of woodland and grassland lying west of the boundary of the London Boroughs of Merton and Wandsworth, and a much thinner strip running south from there, parallel to the Beverley Brook. The latter is described briefly in the penultimate paragraph.

Although the ever-present noise of the Kingston By-pass can be heard in the background, this part of Wimbledon Common is a pleasant addition to the main common to the east. The most attractive feature of this small corner is an open area of rough grassland which in summer is alive with hordes of grasshoppers, butterflies, moths and spiders. Hawthorn and oak scrub partially surround the grassland, which consists largely of fiorin and Yorkshire fog. Meadow vetchling, goat's-beard, creeping thistle, field rose and a multitude of the starry-flowered lesser stitchwort are scattered through the sward. Ant hills project through the tall grasses, in some cases their dry powdery summits providing a niche for tufts of barren fescue, an uncommon grass in London.

To the south is a partially concreted area which is rapidly being overrun by nature. In summer, common butterflies such as skippers and meadow browns can be seen flitting among the flowers, which include the tall spikes of yellow melilot, birdsfoot-trefoil (the preferred food plant of the common blue butterfly), rough hawkbit, goat's rue, tufted vetch, hardheads and rose-bay willow-herb. The main grass in this area is meadow foxtail.

At the bottom of the bank, by the Beverley Brook, scrub has developed, interspersed with more open areas of tall grassland. The grassy expanses consist of a mixture of oat grass, cock's-foot, Timothy, barren brome and fiorin, while noteworthy flowers include the impressive welted thistle among more common ones such as yarrow, creeping cinquefoil, cut-leaved cranesbill and the very unpleasant-smelling black horehound. White bryony drapes across the occasional hawthorn bush. Nests of the spider *Pisaura mirabilis* can be seen here, near the tops of grasses or herbaceous vegetation. The female of this large, grey-and-fawn spider carries her cocoon full of eggs in her jaws until the spiderlings are about to hatch. She then attaches it to the vegetation, spins a silken tent over it and stands guard until her infants have dispersed. The male has developed an unusual ruse to increase his life expectancy. He catches a fly or other choice morsel and wraps it thickly in silk as a courtship "gift". He carries his parcel during his search for a female. When he finds her, if he still has the gift, mating takes place while she eats it. Otherwise she eats him!

Woodland which covers the northern end of this site is so dense in places that it is almost impenetrable. The main trees here are pedunculate oak, young hornbeam, hawthorn and some ash. The jungle-like understorey is a tangle of holly, ivy and elder, below which cow parsley and nettles struggle for light. Less frequent inhabitants of the woodland floor and edge include wood avens, red-veined dock, hedge woundwort, nipplewort, greater stitchwort, bittersweet and field rose. A ring of mature horse chestnuts, part way into the woodland, casts so much shade with their large, hand-like, dark green leaves that no vegetation can grow beneath it.

The sides of the Beverley Brook are reveted with concrete at this point, contrasting with the wooden revetments along the majority of its length beside Wimbledon Common. In the far north of this part of the site the woodland changes. Here it is similar to that on the east side of the Beverley Brook. Dense holly and blackthorn makes progress difficult below the hornbeam, sycamore, Norway maple and wych elm trees. Bridges over the brook at the north and south ends give access to the main part of Wimbledon Common.

Playing fields border the west of the whole site. In the south just a thin strip of woodland separates them from the brook. This woodland is much the same as that included in the SSSI on the eastern side of the brook, consisting mainly of oak and birch. It continues southwards for over a kilometre to link up with Coombe Wood (Ki BII 7). It is possible to make one's way through this strip of woodland but a shady path along the east side of the brook can be much more easily followed southwards to Coombe Wood and this makes a pleasant walk. There is another footbridge over the Beverley Brook when Coombe Wood is reached.

All of the site north of Robin Hood Lane, which is most of it, is managed by the Wimbledon Common Conservators, on behalf of local people. There is free public access to the whole site.

The geology of the site is reflected in the composition of the present-day vegetation and in past land use. On the land use map of London produced by Milne at the end of the 18th century, the bottom of the valley, on the richer, wetter soils, was depicted as a forest known as Coombe Wood, whereas the top of the hill on poorer soils was shown as common land, presumably grazed heathland, called Coombe Warren. Rabbits would have been kept here. In 1852, Bidens recorded that parts of Coombe Hill had been brought into cultivation, and this is borne out by the presence of field boundaries on the site. From the late 19th century, Coombe and Kingston Hills became a desirable area for people to build the grandest of mansions standing in their own ample grounds and which could be reached comfortably by driving from London, yet furnished all the rural pleasures of Surrey. This was the setting for the *Forsyte Saga* by John Galsworthy.

Several springs arise on Coombe Hill. These provided the original water supply for Hampton Court. Conduit houses were built at the source of the springs and the supply was taken under the Thames by an impressive series of pipes.

The heathland forms isolated patches in the rough beside some of the fairways, and particularly where local topography renders close mowing difficult. The heather can be seen from afar as dark, brownish-green shadows amongst the brighter grasses, which line the manicured fairways. None of the heather patches is more than a few hundred square metres in extent. Although common heather is the dominant species, there is one small patch of bell heather, with its larger, deep pink-purple flowers. All the heather appears to be even-aged and relatively young, and in most places is mown to a height of about ten centimetres. A recently-excavated pit near the centre of the course (at the top of the hill) forms a heather-lined basin, pink with flowers in August and alive with bees and grasshoppers, despite the golf balls sailing overhead in lethal parabolas.

Most of the fairways have been re-seeded and fertilised, but grasses and wild flowers characteristic of dry acid soils can be found amongst the heather patches and form more extensive tracts along the edges of the fairways. These acid grassland species include mat-grass, with its thin, blue-black, one-sided flower-spike resembling a saw's edge, and purple moor-grass, which has blue-green leaves tapering to a sharp, purple-tinged point. Both these species are now restricted in London to a few of the more intact heathland and acid grassland sites. Commoner grasses of this habitat type, such as wavy hair-grass, early hair-grass, fescues and bent-grasses, make up most of the sward. Other plant species of heathlands and dry grasslands which are present and have a restricted distribution in the London area include creeping willow, birdsfoot, parsley-piert, common tormentil (one of only two species of the cinquefoil group to have four petals rather than five - thus resembling a tiny, yellow Maltese cross), mouse-ear hawkweed, heath bedstraw (another flower with four petals, but these are creamy-white, smaller and arise from a plant with whorls of tiny, spike-like leaves), heath rush and oval sedge. Other less restricted species such as sheep's sorrel and cat's ear are also present.

A number of small ditches cross the golf course, draining north and north-east towards the Beverley Brook. Along these moss-lined ditches and in other wet places, lesser spearwort, jointed rush, lesser skull-cap, ragged robin and remote sedge can be found.

The fairways are separated by long strips of dense woodland, giving each ribbon of grassland the impression of being an enclosed glade. The woodland roughs are up to a hundred metres or more wide, and in the Nature Conservancy Council's *Ancient Woodland Inventory*, ten hectares of them are considered to be ancient semi-natural woodland, some of the last remains of the Coombe Wood of old. Oak is the dominant tree species, with smaller amounts of birch, pine and sycamore in the canopy. The latter two are more recent arrivals. Some of the woodland roughs consist of tall oak standards beneath which rowan and holly are the main understorey species but elder, goat willow and increasingly rhododendron also find a place here. The latter species is an invasive, non-native shrub which is taking over much of the woodland on the higher land. Control measures should be taken against this weed, as it swamps the ground flora, chemically changes the soil to prevent other species taking root and spreads rapidly. In some of the more recently planted strips, pine dominates, sometimes with broom beneath. In summer the ground layer of the woodland strips consists largely of a tangle of bright green bracken fronds and bramble, beneath which the remains of the spring's bluebells (now a pale papery-brown colour) together with creeping soft-grass, wood sage, foxglove and yellow pimpernel can be found by those intrepid enough to push their way through the dense undergrowth.

The areas of heather on the golf course have shrunk over the last few years and sensitive management will be required to maintain or enhance the wildlife value of the remaining heathland and acid grassland. This need not conflict with management of the site as a golf course, and could even improve the already considerable landscape value of the site.

Although the golf course is owned by the Borough, it has no role in the management of the heathland and the acid grassland, which is the responsibility of the golf club. Access is restricted to golfers but the general public need not be denied a sight of heathland in the area since there is free access to expanses of heather (most impressive in August) on nearby Wimbledon Common, in the Boroughs of Merton and Wandsworth.

M101 Wimbledon Common

Grid ref TQ 216 717
Area 415 ha (4.9 ha in Kingston)
See map on page 33

Wimbledon Common is London's finest example of heathland, with extensive areas of acid grassland, secondary woodland, damp heath and one fine bog. It contains the second largest Site of Special Scientific Interest in London, and although the SSSI lies wholly in the Boroughs of Wandsworth and Merton, a small part of the common, on the western side of the Beverley Brook, is in Kingston. The following description concentrates only on the area in Kingston. This consists of a lens of woodland and grassland lying west of the boundary of the London Boroughs of Merton and Wandsworth, and a much thinner strip running south from there, parallel to the Beverley Brook. The latter is described briefly in the penultimate paragraph.

Although the ever-present noise of the Kingston By-pass can be heard in the background, this part of Wimbledon Common is a pleasant addition to the main common to the east. The most attractive feature of this small corner is an open area of rough grassland which in summer is alive with hordes of grasshoppers, butterflies, moths and spiders. Hawthorn and oak scrub partially surround the grassland, which consists largely of fiorin and Yorkshire fog. Meadow vetchling, goat's-beard, creeping thistle, field rose and a multitude of the starry-flowered lesser stitchwort are scattered through the sward. Ant hills project through the tall grasses, in some cases their dry powdery summits providing a niche for tufts of barren fescue, an uncommon grass in London.

To the south is a partially concreted area which is rapidly being overrun by nature. In summer, common butterflies such as skippers and meadow browns can be seen flitting among the flowers, which include the tall spikes of yellow melilot, birdsfoot-trefoil (the preferred food plant of the common blue butterfly), rough hawkbit, goat's rue, tufted vetch, hardheads and rose-bay willow-herb. The main grass in this area is meadow foxtail.

At the bottom of the bank, by the Beverley Brook, scrub has developed, interspersed with more open areas of tall grassland. The grassy expanses consist of a mixture of oat grass, cock's-foot, Timothy, barren brome and fiorin, while noteworthy flowers include the impressive welted thistle among more common ones such as yarrow, creeping cinquefoil, cut-leaved cranesbill and the very unpleasant-smelling black horehound. White bryony drapes across the occasional hawthorn bush. Nests of the spider *Pisaura mirabilis* can be seen here, near the tops of grasses or herbaceous vegetation. The female of this large, grey-and-fawn spider carries her cocoon full of eggs in her jaws until the spiderlings are about to hatch. She then attaches it to the vegetation, spins a silken tent over it and stands guard until her infants have dispersed. The male has developed an unusual ruse to increase his life expectancy. He catches a fly or other choice morsel and wraps it thickly in silk as a courtship "gift". He carries his parcel during his search for a female. When he finds her, if he still has the gift, mating takes place while she eats it. Otherwise she eats him!

Woodland which covers the northern end of this site is so dense in places that it is almost impenetrable. The main trees here are pedunculate oak, young hornbeam, hawthorn and some ash. The jungle-like understorey is a tangle of holly, ivy and elder, below which cow parsley and nettles struggle for light. Less frequent inhabitants of the woodland floor and edge include wood avens, red-veined dock, hedge woundwort, nipplewort, greater stitchwort, bittersweet and field rose. A ring of mature horse chestnuts, part way into the woodland, casts so much shade with their large, hand-like, dark green leaves that no vegetation can grow beneath it.

The sides of the Beverley Brook are reveted with concrete at this point, contrasting with the wooden revetments along the majority of its length beside Wimbledon Common. In the far north of this part of the site the woodland changes. Here it is similar to that on the east side of the Beverley Brook. Dense holly and blackthorn makes progress difficult below the hornbeam, sycamore, Norway maple and wych elm trees. Bridges over the brook at the north and south ends give access to the main part of Wimbledon Common.

Playing fields border the west of the whole site. In the south just a thin strip of woodland separates them from the brook. This woodland is much the same as that included in the SSSI on the eastern side of the brook, consisting mainly of oak and birch. It continues southwards for over a kilometre to link up with Coombe Wood (Ki BII 7). It is possible to make one's way through this strip of woodland but a shady path along the east side of the brook can be much more easily followed southwards to Coombe Wood and this makes a pleasant walk. There is another footbridge over the Beverley Brook when Coombe Wood is reached.

All of the site north of Robin Hood Lane, which is most of it, is managed by the Wimbledon Common Conservators, on behalf of local people. There is free public access to the whole site.

M113 Sixty Acre and Jubilee Woods

Grid ref TQ 164 622
Area 29 ha (23 ha in Kingston)
See map on page 37

This site lies at the northern end of an extensive area of London Clay commons or former commons which are now largely wooded; the total area of these is about 300 hectares, making it one of the largest blocks of woodland to be found in London or on its margins. Only Jubilee Wood and most of Sixty Acre Wood lie within Greater London, the rest being in Surrey.

Sixty Acre Wood

Sixty Acre Wood is one of the most interesting woodlands in the London area for nature conservation. Its exceptional flora, including many uncommon species, is alone sufficient to support this claim, but in addition it holds a good fauna and has a most unusual history. The wood lies on a west-facing hill which slopes down to The Rythe, a small river running north through Surrey to the Thames at Thames Ditton. The top of the hill is covered with sandy deposits of Claygate Beds, which consist of well-defined alternations of sand and clay, sand predominantly above and clay below. The lower slopes are of London Clay, and are quite wet in places. The combination of these strata gives rise to a range of soil types on which grow plants associated with both acid and calcareous conditions, often in close proximity.

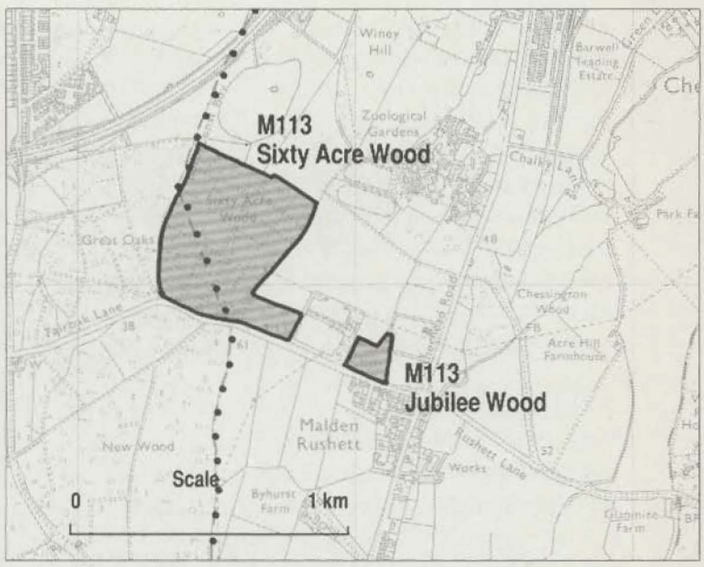
Sixty Acre Wood contains a large number of plant species which, in this area of Britain, are strongly associated with ancient woodland, in other words land which has been *continuously* wooded for centuries. (Technically, ancient woodland is defined as that which has been present since AD 1600.) The presence of one such *ancient woodland indicator species*, as they are called, would not alone be proof that a woodland was very old, but the more there are, the stronger the probability. Sixty Acre Wood possess no less than thirty-six such plants, probably more than any other wood in the London area or in neighbouring parts of Surrey. From the biological point of view, therefore, there is absolutely no reason to doubt the antiquity of the wood.

The presence of earthworks dating from medieval or even earlier times often provides further clues to a site's history. Such structures were dug to define boundaries and to help control grazing, which could not be allowed for several years after coppice was cut. Sixty Acre Wood is almost encircled by a bank and ditch system, although most of the southern section is missing, probably destroyed when the adjacent road was widened. Much of this ditch system may well be of Saxon origin, as it delimited the southern tip of Kingston Parish as it was until boundary changes consigned part of the wood to Surrey. There are also several lengths of bank and ditch within the wood.

Despite this seemingly conclusive proof, however, there is good evidence (unearthed by John Hodge, a local naturalist, and others) that this is *not* ancient woodland, as the land seems to have been used for agriculture for quite some years a couple of centuries ago. A map by John Rocque dated 1762 displays fields on what is now Sixty Acre Wood, and an 1813 map of the Parish of Kingston by Thomas Horner also shows fields here; there is no reason to doubt the veracity of this map as it shows other local hedgerows and fields with considerable accuracy, albeit on a very small scale. What is now the main north-south ride through the wood is clearly marked as a hedgerow, and it is likely that present drains also delineate old hedges. The First One-Inch Ordnance Survey Map of about 1820 also shows Sixty Acre Wood as fields. In support, ground along the western edge and near the southern boundary of the wood displays regular undulations of ridge-and-furrow, suggesting past ploughing or drainage.

The 1870 Ordnance Survey Map does show Sixty Acre Wood, as does the 1872 Barwell Court Estate Map. It seems that shortly after the earlier maps were made the grounds of the nearby Barwell Court were landscaped. The fields nearest the house were made into parkland, while those further south became the wood. Sweet chestnut and dense hazel coppice to the east of the main north-south ride may have been planted at this time.

How can the apparently conflicting evidence on the history of the site be explained? Perhaps some woodland plants survived in the bottoms of hedges and subsequently spread back into adjacent woodland – although most ancient woodland indicator species are normally slow to colonise. Butcher's broom, one of the slowest, does appear to be still confined to old banks and ditches in Sixty Acre Wood, Chessington Wood and on Winey Hill. Isolated trees, or groups of them, or patches of scrub may have been left in the fields, and these may also have "sheltered" plants. A wood now called Great Oaks lies adjacent to Sixty Acre, and some of the woodland plants may have spread from here. The conversion to agricultural land was almost certainly not as radical as it would be today; powerful machines were not available for deep ploughing and drainage, nor had modern chemical fertilizers been invented, so the original soil and some of the plant life may have continued relatively intact. Some species, such as betony and primrose, could easily have survived in meadows which were not intensively grazed. In addition, the site embraces a range of soils, providing suitable opportunities for a wide variety of plants, and this may partially explain the botanical richness of the wood.



Not surprisingly the composition of the tree canopy in Sixty Acre Wood is mostly of relatively recent origin. Ash is dominant or co-dominant over much of the wood, but few specimens are old coppice stools, many being "maidens" or single-stemmed trees. Accompanying the ash in considerable quantities are hazel and birch, the former perhaps being planted when the Barwell Estate was landscaped, and the latter being a species which can rapidly invade open areas. Oak is also common, both planted Turkey oak and pedunculate oak, and hornbeam, a tree of ancient woods, occurs locally. Alder grows in damp patches on the lower ground in the west of the wood. Sweet chestnut has been planted on the drier soils higher up on the eastern edge, probably when the grounds of Barwell Court were landscaped. Sycamore is dominant in the north-east corner, where fully grown trees, saplings and seedlings are all present. Other trees to be found, all in small quantities, include field maple, gean, aspen, English elm, wych elm, pear and small-leaved lime. In Britain the latter is strongly associated with ancient woodland, and extremely uncommon in London except as planted specimens; it rarely produces viable seeds in our cool summers. Here it occurs as a small sapling and a seedling in the very centre of the wood although how it arrived is another mystery of this site.

A good range of shrubs is present in the wood: hawthorn, blackthorn, field rose, elder, alder buckthorn, dogwood, guelder rose and privet. The latter three are indicative of somewhat calcareous soils; guelder rose and privet are scattered throughout much of the wood.

The most abundant ground cover plant is bramble, but this does not prevent an exceptionally rich ground flora from surviving. This includes plants of calcareous conditions, such as sanicle, wild strawberry, sweet woodruff, hairy St John's wort and butcher's broom; of acidic soils, such as wood sage, trailing St John's wort and gorse; and of wet places, such as lesser spearwort, valerian, brooklime, ragged robin and marsh bedstraw. The richest areas of the wood floristically tend to be those in the lower, damper and less disturbed sections, as well as on or near tracks and paths, where more light penetrates. Some of the paths would benefit from opening up if the flora is to survive in the longer term, as they are becoming overgrown and shaded.

Five species of orchid grow in the wood, common spotted being the most numerous. Early purple orchid is abundant in a small area near the Borough boundary, suggesting that it is a relatively recent arrival and is slow to spread into the rest of the wood. The other three orchids here are twayblade and broad-leaved and violet helleborines; this is one of only a handful of known localities in the London area for the latter. Tutsan, which is uncommon in the wild outside south-west England, grows in several parts of the wood; it is the largest of our native St John's worts, and is sometimes planted in gardens. In more open areas at the northern edge of the wood grow plants such as ragged robin, square-stemmed St John's wort and lady's smock, more commonly found in damp meadows. Common violet, bugle and bluebell are abundant, but red campion, usually a prominent part of woodland floras, is conspicuous here by its absence.

Eight species of fern grow in the wood, a good list for the dry south-east of Britain; included are scaly male fern and hard shield-fern, which are very uncommon in the London area. Twenty-two species of moss and three of leafy liverworts have been found, and there are probably others as yet undiscovered here.

Table 1 (on page 39) lists species of trees, shrubs, other higher plants and ferns found in Sixty Acre Wood which are uncommon in London or are particularly associated with ancient woods.

A line of pylons crosses Sixty Acre Wood, and the vegetation within the wayleave below is maintained by coppicing to prevent the regeneration of tall trees. This mimics former management, when sections of the wood, or "falls", would have been cut in a regular rotation. Although woodland plants can often survive for years in dense shade, many do better in more open conditions; a few years with decreased shading allows them to thrive without providing time for more competitive, light-demanding species to swamp them. Most former coppice woods have been left uncut for many years, so such management is to be welcomed, and indeed the flora which was to be found on the lower slopes of the wayleave following recent coppicing contained excellent populations of common spotted orchid, wood spurge, wild strawberry, marsh bedstraw and others. More traditional coppicing has also been undertaken in an area near Fairoak Lane by the Lower Mole Countryside Management Project.

There is a fairly diverse woodland avifauna, including warblers, all three species of woodpeckers, and coal tits. Abundant tracks of roe deer indicate a large population of this species is present, hares inhabit the woodland, and there are old records of dormice from this site and recent records from nearby areas of Surrey; all these mammals are now very rare within the London area. Woodland butterflies present include purple hairstreak and white admiral; the latter pretty black and white species is at present largely restricted in the London area to northern Surrey and parts of Hertfordshire, but is now expanding its range.

Jubilee Wood

Jubilee Wood, which adjoins Sixty Acre Wood to the east, is also included in the site. It was planted in 1887 to commemorate the Golden Jubilee of Queen Victoria, and is more obviously a plantation. It is now divided into two blocks, separated by an electricity transformer station. It lies on a level area of clay soils.

The principal trees in Jubilee Wood are birch, pedunculate oak and ash, but large specimens are sparse; field maple, goat willow, wych elm and hazel occur in lesser numbers. Beneath the canopy is a dense, impenetrable thicket of hawthorn, bramble and rose, and ivy is abundant both on the ground and attached to tree trunks. The ground flora is much less diverse than that in Sixty Acre Wood, but does include lady-fern, wood sedge, hairy woodrush and common violet, all in local abundance, and greater quantities of slender false-brome, male fern, broad buckler-fern and soft rush. Although not of Metropolitan Importance in its own right, Jubilee Wood does make a valuable extension of the total woodland area, and is therefore included within this site. The eastern end of Jubilee Wood is owned by the Borough, and the Lower Mole Countryside Management Project has drawn up management proposals to improve the wildlife and amenity value.

Much of Sixty Acre Wood is used for playing war games. Although biodegradable paint is employed, trampling and the construction of trenches, stockades and look-outs is causing serious damage to the soils, flora and fauna of this wonderful woodland. Populations of some of the rarest plants are threatened. Another threat is a proposal to build a by-pass nearby, running close to the eastern edge and possibly clipping the corner. If this road were built, the noise from traffic would permeate the whole site.

Both Sixty Acre Wood and the western end of Jubilee Wood are privately owned, with no public access. Both lie wholly within the Green Belt.

Table 1 Uncommon plants and ancient woodland indicator species found in Sixty Acre Wood

English name	*Latin name*
Adder's tongue	*Ophioglossum vulgatum*
Alder buckthorn	*Frangula alnus* *
Aspen	*Populus tremula* *
Barren strawberry	*Potentilla sterilis* *
Betony	*Stachys officinalis* *
Bitter vetch	*Lathyrus montanus* *
Black currant	*Ribes nigrum* *
Broad-leaved helleborine	*Epipactis helleborine* *
Brooklime	*Veronica beccabunga*
Butcher's broom	*Ruscus aculeatus* *
Common speedwell	*Veronica officinalis*
Common spotted orchid	*Dactylorhiza fuchsii*
Cowslip	*Primula veris*
Crab apple	*Malus sylvestris* *
Early purple orchid	*Orchis mascula* *
Field maple	*Acer campestre* *
Field rose	*Rosa arvensis* *
Forster's woodrush	*Luzula forsteri* *
Gean	*Prunus avium* *
Goldilocks	*Ranunculus auricomus* *
Gooseberry	*Ribes uva-crispa*
Guelder rose	*Viburnum opulus* *
Hairy St John's wort	*Hypericum hirsutum*
Hairy woodrush	*Luzula pilosa* *
Hard shield fern	*Polystichum aculeatum* *
Hornbeam	*Carpinus betulus* *
Lesser pond-sedge	*Carex acutiformis*
Lesser skull-cap	*Scutellaria minor* *
Lesser spearwort	*Ranunculus flammula*
Many-headed woodrush	*Luzula multiflora*
Marsh bedstraw	*Galium palustre*
Midland hawthorn	*Crataegus laevigata* *
Narrow buckler-fern	*Dryopteris carthusiana* *
Pignut	*Conopodium majus* *
Primrose	*Primula vulgaris* *
Ragged robin	*Lychnis flos-cuculi*
Red currant	*Ribes rubrum* *
Remote sedge	*Carex remota* *
Sanicle	*Sanicula europaea* *
Scaly male fern	*Dryopteris affinis*
Sessile oak	*Quercus petraea* *
Small-leaved lime	*Tilia cordata* *
Square-stemmed St John's wort	*Hypericum tetrapterum*
Sweet briar	*Rosa rubiginosa*
Sweet woodruff	*Galium odoratum* *
Three-nerved sandwort	*Moehringia trinervia* *
Trailing St John's wort	*Hypericum humifusum*
Tufted forget-me-not	*Myosotis laxa*
Tutsan	*Hypericum androsaemum* *
Twayblade	*Listera ovata*
Valerian	*Valeriana officinalis*
Violet helleborine	*Epipactis purpurata* *
Wood anemone	*Anemone nemorosa* *
Wood groundsel	*Senecio sylvaticus*
Wood melick	*Melica uniflora* *
Wood sedge	*Carex sylvatica* *
Wood speedwell	*Veronica montana* *
Wood spurge	*Euphorbia amygdaloides* *
Wych elm	*Ulmus glabra* *
Yellow pimpernel	*Lysimachia nemorum* *

* Indicates that, in south-east England, the species is more-or-less restricted to ancient woodlands when found growing well within the wood and not obviously planted. This is based on information from the Nature Conservancy Council, with some omissions of plants not thought to be indicators in London.

Records are from surveys in 1987 by John Hodge, in 1987 by David Stubbs, and in 1989 by the London Ecology Unit.

9 Sites of Borough Importance Grade I

Ki.BI 1 Hogsmill Valley Sewage Works and Hogsmill River

Grid ref TQ 193 684
Area 22 ha

The main wildlife interest of this sewage treatment works and adjacent stretch of river rests with the wealth of birdlife, particularly migrants, to be found on and around the series of sludge settling lagoons and the river. Botanically, this site is less remarkable, consisting of coarse grassland, weedy patches and dense river bank vegetation along the River Hogsmill. Before the turn of the century, the area was occupied by agricultural land, both meadow and arable.

Originally there were two much smaller works, Malden & Coombe Sewage Works across the Hogsmill to the north-east and Surbiton Sewage Works to the south, just west of where Berrylands station is now. In 1959 the main central part of the present-day works was constructed and the two original works incorporated into the new larger area. The main wildlife value generally lies in the older parts of the works and for this reason the newer, central part is not included within the site boundary. However, even this area has some value for birds.

The most extensive unmanaged area lies at the west end of the works, where three disused sludge beds have been taken over by vegetation. The flat, polygonal floors of the lagoons now support a carpet of nettles, oat grass and hemlock, while common wild flowers such as common mallow, cow parsley, red dead-nettle, yarrow and creeping cinquefoil are spreading downwards from the surrounding steep, grassy banks. On the tops of the banks some alder, birch and false acacia scrub has grown up.

The westernmost "lagoon" has, at its centre, a pool surrounded by sallows. Here the tall stands of reedmace with their flowerheads like sausages on sticks and the dense patches of great hairy willow-herb provide valuable cover for wildlife. Several bird species breed here, including whitethroat, willow warbler, reed bunting and coot. Unfortunately, this pond is being used as a dump for refuse originating within the works and this is encroaching on one side.

Just to the south of this area is another strip of wasteland with a few large oaks and crack willows, a haunt of bullfinches. Beyond the westernmost lagoon lies a further stretch of coarse grassland, with scrub of hawthorns and birches. The occasional fox hole can be seen, scratched out amongst the long grass, creeping cinquefoil and tall, purple-blotched stems of the extremely poisonous hemlock.

This site includes the section of the Hogsmill River from the Surbiton to Waterloo main line as far as Villiers Road, running to the north of the sewage works and to the south of Kingston Cemetery. It flows between steep, lushly-vegetated banks, but the river itself is fairly shallow with a gravelly bed, and a few minutes of patient watching may reveal the darting forms of dace and minnows beneath its rippling surface. Below the discharge from the treatment works, the river is actually composed of 80% sewage effluent, and in times of storm it may present a more polluted aspect. Overhanging the water's edge and spreading up the banks is a mass of hemlock, nettles, bramble, horse-radish, common mallow and, in some places, policeman's helmet and Japanese knotweed, the latter two species being highly invasive. Scattered trees and scrub of birch, elder, ash, crack willow and sycamore provide added interest in places. Water rails, sand martins, moorhens, kingfishers and grey wagtails breed along the river. All except moorhens are rare breeding birds in the London area. Stonechats make use of the bankside vegetation.

For much of the northern length of the sewage works, a raised bank borders the river. Covered in couch grass and many wild flowers such as mallow, melilot, clovers, mugwort and hoary pepperwort, this is a haven for common butterflies. If this area was mown every one or two years in September and the clippings removed, the vegetation would be controlled and the wildlife value maintained, without resorting to herbicides. In some places young trees have been planted. Further into the works closely-mown green banks, often speckled white with gulls, surround the complex of tanks and pipework which emits distant gurgling and swooshing noises.

The sludge settlement lagoons lie in the northern and eastern parts of the site. The habitats here depend on the operation of the works, as well as showing seasonal variation. However, at any one time a range of conditions can be found in the different lagoons. Some may be full of a foetid soup of water, rich in planktonic algae and resistant invertebrates such as tubificid worms and chironomid (midge) larvae. Although being unattractive to humans, such lagoons are frequented by gulls, coots, green sandpipers and ducks, sometimes including over a hundred teal in hard weather. Swallows, swifts and martins can be seen swooping over the water in summer to feed on the emerging midges.