

NRA THAMES 309



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*National Rivers Authority
Thames Region*

Hogsmill Catchment Landscape Assessment

HOGSMILL CATCHMENT LANDSCAPE ASSESSMENT

**Report prepared by
WS Atkins Planning Consultants**

on behalf of

**National Rivers Authority
Thames Region**

April 1994

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1. INTRODUCTION

PURPOSE OF STUDY

- 1.1 In October 1993 the National Rivers Authority Thames Region commissioned WS Atkins Planning Consultants to carry out a strategic and detailed landscape assessment of the Hogsmill Catchment, which includes nearly 20 kilometres of watercourse. The main river rises as a spring at Ewell and flows north for 10 kilometres before entering the Thames at Kingston. The principal tributaries are the Bonesgate Stream, Green Lanes Stream and Surbiton Stream.
- 1.2 The landscape assessment will form part of a wide ranging investigation of the Hogsmill catchment currently being undertaken with a view to implementing major river restoration and environmental enhancement works funded from the Flood Defence capital budget. The catchment has been chosen as a pilot project, to be progressed from initial studies to implemented works and used as a model for a programme of similar projects in other catchments.

Strategic Assessment

- 1.3 The purpose of the strategic landscape assessment can be summarised as follows:
 - to provide broad scale information about variations in the character and quality of river landscapes, which can be used in catchment planning, as part of an integrated corridor assessment, in consultations on major development proposals, and for making inter-catchment comparisons.
 - to explain the system of classification and evaluation so that the document may make an authoritative contribution to planning processes.
 - to act as a post-project/post management appraisal document to assist with other NRA studies, including land drainage and flood defence works.
 - to communicate a thorough understanding to NRA staff and others of the regional and local factors and processes, which have influenced the catchment in the past and are currently changing its environment.

Detailed Assessment

- 1.4 The purpose of the detailed landscape assessment is to identify specific lengths of river corridor and degraded sections of riparian landscape that can be significantly improved by enhancement works funded by National Rivers Authority (Thames Region) Environmental Enhancement budget. The scope and approximate costs of these works are defined together with other sources of funding identified during the study.

METHODOLOGY

- 1.5 The strategic and detailed landscape assessments are based on the NRA methodology for river landscape assessment which was developed in part to fulfil the environmental duties of the NRA, as set out in Sections 8 and 9 of the Water Act 1989 and Section 16 of the Water Resources Act 1991. The process of assessment in the standard methodology is divided into four main stages:

Step 1: Definition of Purpose. The purpose of the assessment as defined in the NRA brief indicates what the study will be used for and relates to the level of study.

Step 2: Desk Study. The study area is defined and background information gathered and processed to provide a basis for the field study (Step 3). A comprehensive review of literature, articles and planning policies is undertaken in order to examine the physical and human influences on the riparian landscape of the catchment.

Step 3: Field Study. The river valley/corridor is surveyed using field recording forms and photography to record specific features.

Step 4: Analysis. The field records and desk study are collated, reviewed and analysed; conclusions are presented in a report form.

STRUCTURE OF THE REPORT

- 1.6 Chapter 2 - **The Development of the Landscape** is a summary of the physical and human influences upon the landscape and distils the findings of the desk study in relation to geology, landform, soils, drainage, landscape history and human influences.
- 1.7 Chapter 3 - **Nature Conservation** describes the wildlife habitats adjoining the river and summarises the findings of the NRA River Corridor Survey and Biological Survey.
- 1.8 Chapter 4 - **Planning Context** reviews the relevant policy designations affecting the catchment area and identifies future development proposals and changes in the landscape. It also considers public access and recreation.
- 1.9 Chapter 5 - **Landscape Types** is a classification of the landscape into generic types of common character with maps, written description and sketches. Classification has been carried out at two different scales: within the visual envelope of the river or its tributaries (Macro River Landscape) and the detailed landscape of the watercourse (Micro River Landscape).
- 1.10 Chapter 6 - **Management Strategies** attaches a value to particular Micro River Landscape types and stretches of water course, by reference to specified criteria. The appropriate management strategy for each individual landscape type is then given. The three main strategy options are conservation, restoration or enhancement.
- 1.11 Chapter 7 - **Detailed Assessment** considers the opportunities for the restoration and enhancement of low quality river landscapes and conservation strategy options for sections of watercourse notable for their scenic, historical or ecological merit. The scope and approximate costs of these works are defined.

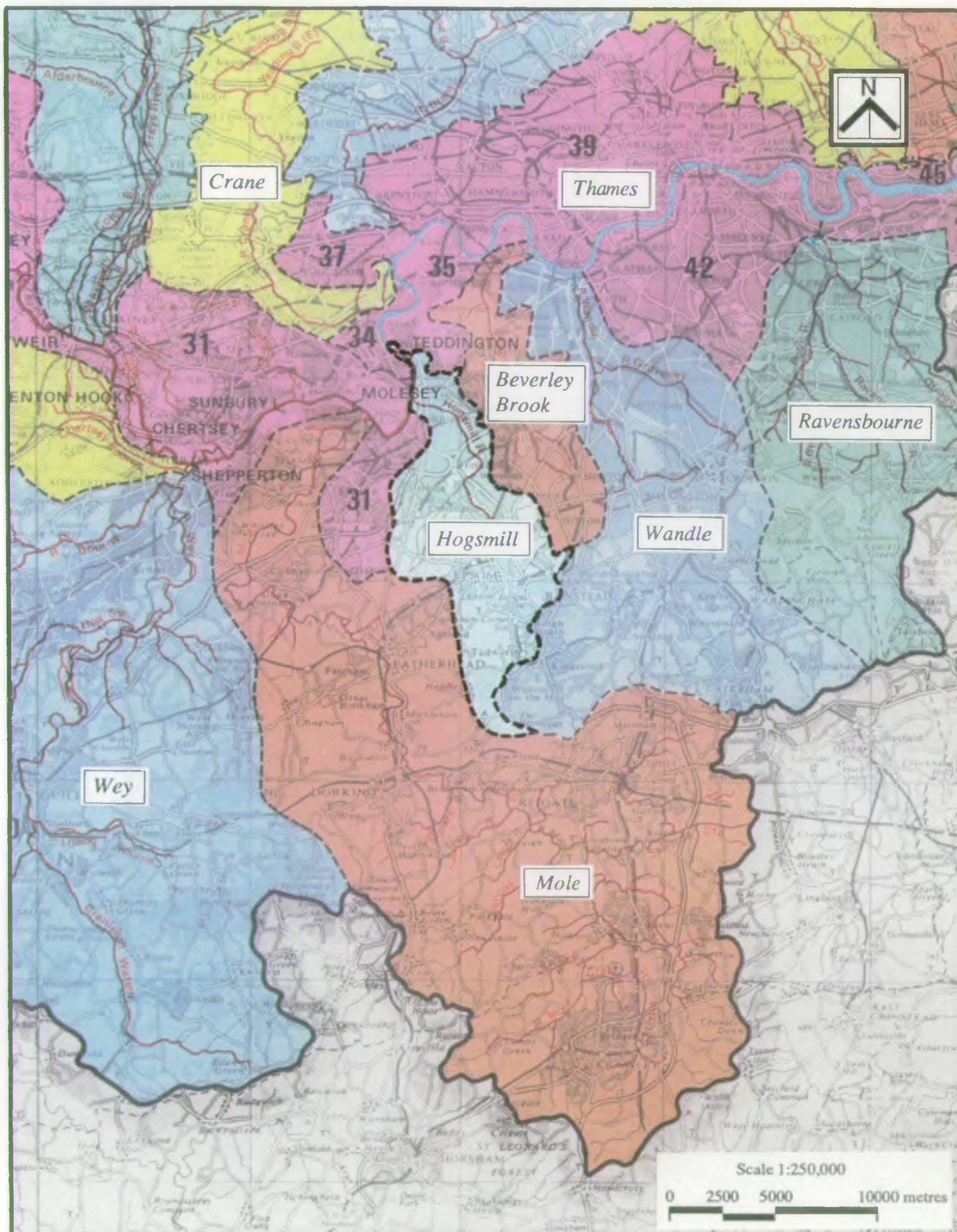


Figure 1.1 The Hogsmill Catchment

2. DEVELOPMENT OF THE LANDSCAPE

PHYSICAL INFLUENCES

Geology

- 2.1 The Hogsmill Catchment runs north from the dip slope of the North Downs to the Thames and covers an area of 73 square kilometres. The catchment is one of the series of South London rivers which lie within the London Basin (see Figure 1.1). To the west is the River Mole and to the east the Beverley Brook and the River Wandle.
- 2.2 The London Basin is a broad trough or syncline which is inclined from the high ground of the North Downs towards the Thames and rises again to the north of London to become the Chiltern Hills. Filling the centre of the syncline are the sands and clays of the older Eocene series. Through Surrey the Eocene sands and clays occupy a belt some 12 kilometres wide, with its southern margin roughly parallel with the Thames. The middle sector of the Eocene belt, between the Mole and The Wandle, is an area of generally lower relief over which the eroded surface of the London Clay is exposed. In the southern parts of the Hogsmill catchment these top layers have been eroded away to reveal the Chalk. Between the London Clay in the northern part of the catchment and the Chalk of the southern part, narrow bands of Thanet Sand and the Woolwich and Reading Beds are exposed (see Figure 2.1).
- 2.3 Lying on top of the London Clay are the fine silty sands and clays of the Claygate Beds. Most of these beds, named after a village near Esher, have been eroded away but those that remain form higher ground for example Richmond Park in the north is over 50 metres.
- 2.4 River Terrace gravels extend along the lower reaches of the Hogsmill River and its tributary the Surbiton Stream. A thin band of alluvial deposits overlays these gravels along the present day watercourses. The final kilometre of the Hogsmill River is within the Thames floodplain, the eastern bank of which is covered with River Brickearth.

Soils

- 2.5 The majority of the watercourses within the Hogsmill catchment lie on soils of the Wickham 3 association. These are characterised by low permeability, clay subsoil

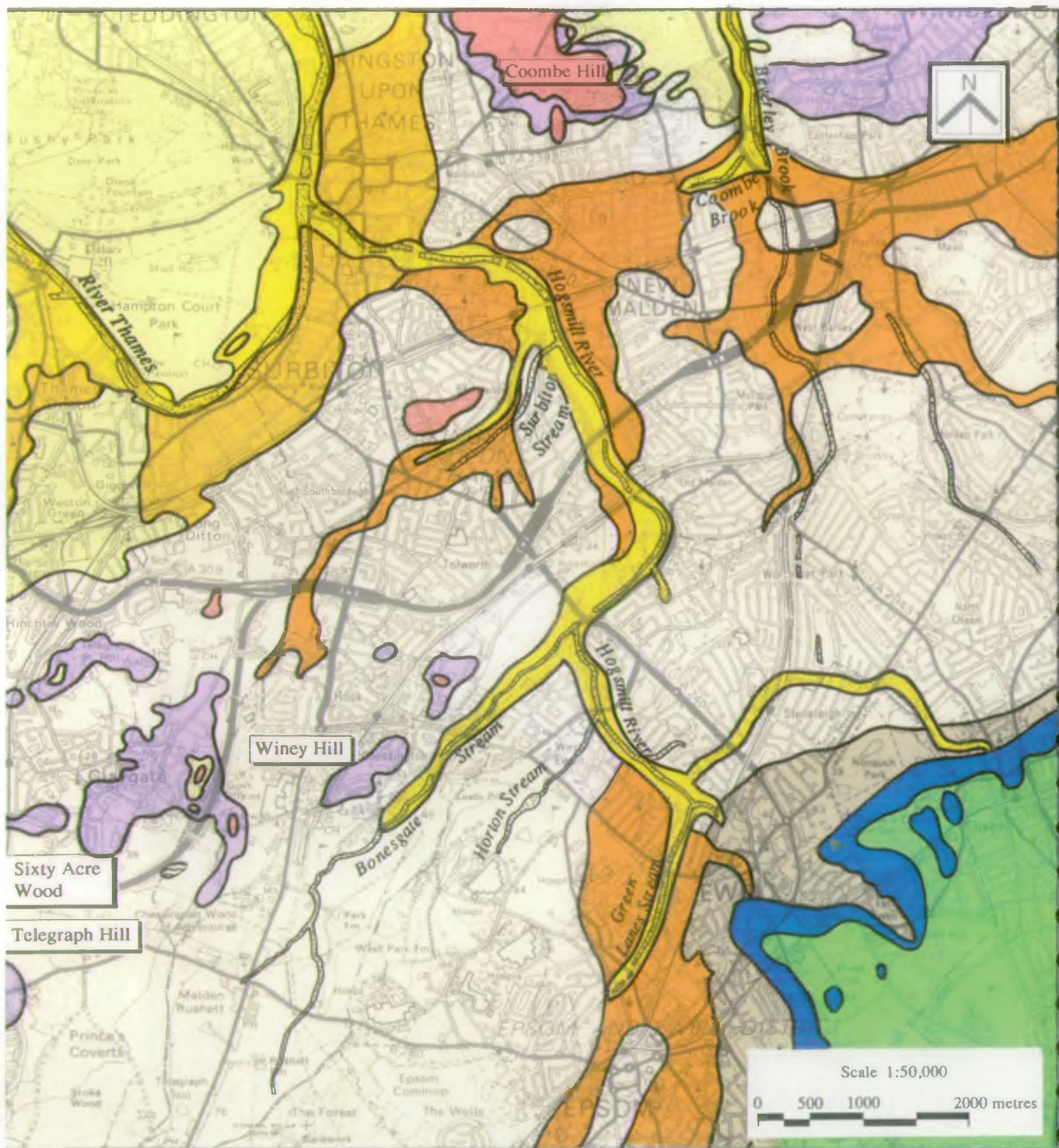


Figure 2.1 Geology

and loamy flint drifts. These heavy damp soils are derived from the London Clay which weathers to a dull brown on exposure. In the southern part of the catchment the soils have a greater percentage of flints derived from the chalk. The bed of the watercourses are often composed of sandy gravels where the channels have exposed the basement beds of the London Clay. The Claygate Beds weather to form acidic soils.

Landform

- 2.6 The catchment slopes gently north from the dip slope of the North Downs towards the floodplain of the Thames. Because the landform is generally level, even quite modest hills such as Winey Hill, Telegraph Hill to the south and Coombe Hill to the north provide extensive views. The summits of these hills are composed of High-level Terrace gravels. These are much more recent deposits of clayey gravels lying on top of the Claygate Beds. The higher ground of Richmond Park to the north of the catchment is capped by the Claygate Beds. The landform and drainage pattern of the catchment are shown on Figure 2.2.

Drainage

- 2.7 The Hogsmill River rises from springs at the centre of the old village of Ewell at the foot of the dip slope of the North Downs. The springs are reputed to be some of the coldest in England. Ewell is one of a succession of spring line villages which lie at the junction of the Chalk, Thanet Sand and London Clay. The catchment extends up the dip slope of the North Downs but because of the porous nature of the chalk substrate there are no surface water courses in this part of the catchment. The main feature of the chalk dip slope is the series of dry valleys which dissect the original Chalk surface.
- 2.8 The river flows within a shallow valley for nearly 10 kilometres north from Ewell before entering the Thames at Kingston. The watercourse has been extensively altered with wide scale channel straightening and realignment. The channel receives an additional discharge from the Hogsmill Sewage Treatment Works.
- 2.9 The main tributary of the Hogsmill is the Bonesgate Stream which originates near Epsom Common and runs the length of the Borough of Kingston. The upper and middle reaches of the stream largely retain their natural meandering course. The lower section near the confluence with the Hogsmill has been extensively altered.

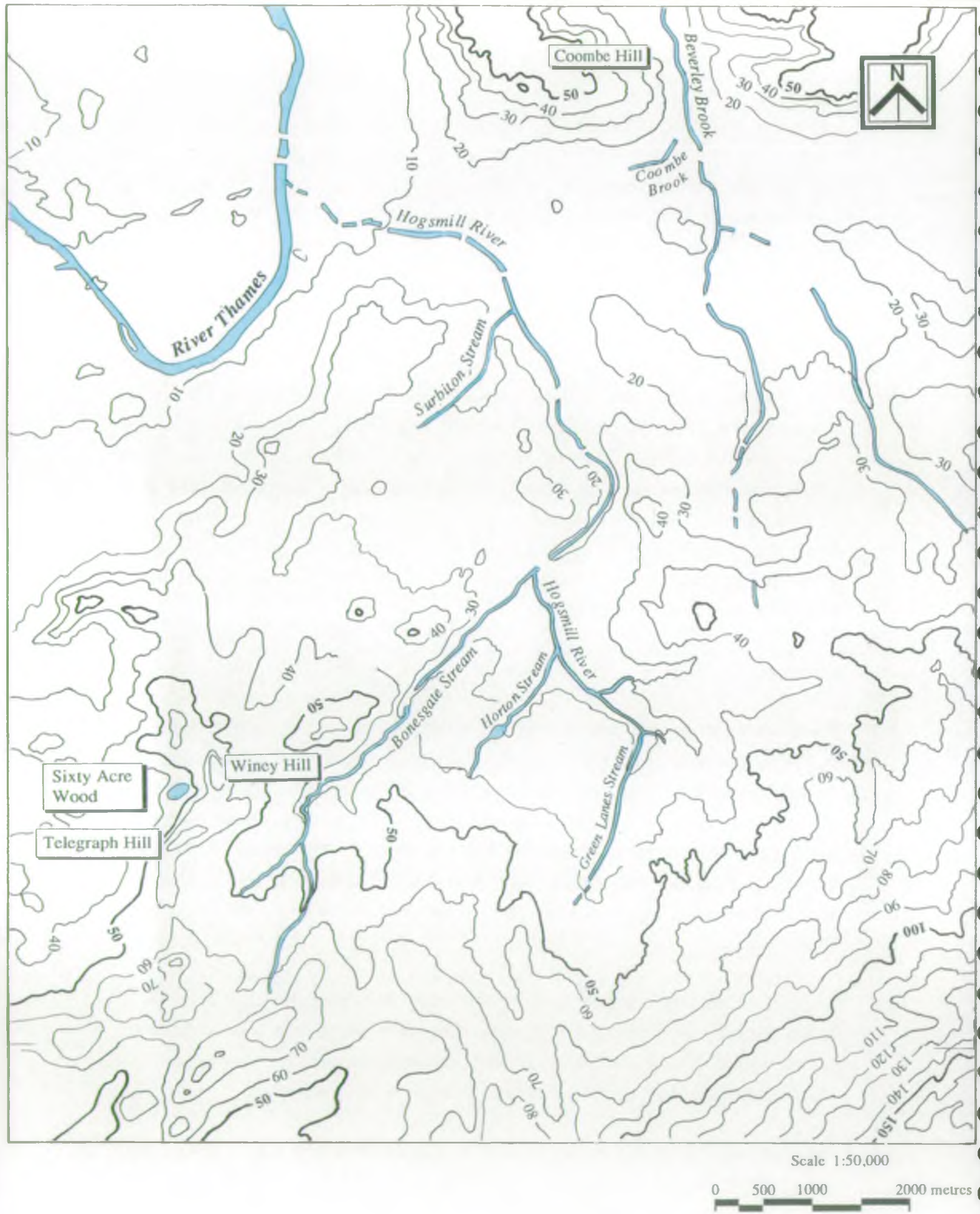


Figure 2.2 Landform and Drainage

- 2.10 The river is fed by four other small tributaries, the largest of which are Green Lanes Stream which flows north from its source in north-east Epsom, and Surbiton Stream which enters the lower course of the Hogsmill. All of these tributaries have been straightened or channelised.
- 2.11 The Hogsmill River has suffered low flows within recent years. The springs at Ewell were dried up for three years, until the rainfall in 1993 recharged the chalk aquifer. Epsom and Ewell Borough Council have recently entered into an agreement with Sutton and District Water Company to augment low flows by pumping from a nearby borehole. The quality of the water is reasonable for an urban catchment and is only affected by short term intermittent pollution. The Bonesgate Stream flows across London Clay which can make it more subject to winter spates.

HUMAN INFLUENCES

Early Settlements

- 2.12 The two main settlements on the Hogsmill River, Ewell at its source and Kingston where it enters the Thames, both have a long and distinguished history. The springs of pure water at Ewell have attracted man from earliest times. There is evidence along the river, near Ewell, of Neolithic, Bronze and Iron Age occupation. The village derives its names from its spring as earlier spellings show; Etwell (9th century) and Awell (12th century) both mean 'at the well'. Archaeological remains have shown that there was a Roman settlement at Ewell and that Stane Street, the Roman road from London Bridge to Chichester, passed through the village.
- 2.13 Kingston is one of only four boroughs in England and Wales which can add the prefix "Royal" to their names. During the 10th century it was the coronation place of Anglo-Saxon kings. The first Kingston coronation was that of Edward the Elder, son of Alfred the Great in 900 - six more kings were also crowned here between 925 to 979. The proud reminder of the Saxon coronations is Kingston's Coronation Stone which stands close to the Hogsmill River near the present Guildhall.
- 2.14 There is a tradition that the Thames was once fordable at Kingston and that this was the crossing used by Julius Caesar in 54 BC. The oldest finds in the Royal Borough are flint tools of the Palaeolithic and Mesolithic periods. Kingston was of considerable importance in the Middle Ages when it possessed the first bridge across the Thames upstream from London.

- 2.15 The Clattern Bridge, which crosses the Hogsmill River close to the Thames, is one of the oldest bridges in Surrey and is a Scheduled Ancient Monument. The earliest known reference is in a deed of 1293 and the medieval name 'Clateryngbrugge' is thought to have been descriptive of the sound of horses crossing the bridge. The stone arches on the downstream side are the oldest parts of the bridge, which until the mid-nineteenth century was only eight feet wide. Figure 2.4 shows an early photograph of the bridge taken in 1906.
- 2.16 By the time of the Domesday Book both Ewell and Kingston were royal manors and as such were held directly by the king. Describing Kingston it said "There is a church and five mills worth twenty shillings and two fisheries worth ten shilling. Ewell was referred to under the Copthorne Hundred as "Etwelle: King's land, two Mills" with a value of twenty shillings.

Water-mills on the Hogsmill River

- 2.17 The Hogsmill was used to drive mills from before the Norman Conquest until the early years of the twentieth century. The river is thought to have got its present name from a Kingston miller called Hogg. The location of Hogg's Mill is shown on John Rocques map of Kingston prepared in 1741 (see Figure 2.3). This is the oldest map of the river in existence. The river was known as the Malden River or the Lurteborne until the fifteenth century.
- 2.18 The driving power of the river is not very great today but it was very much stronger in earlier times. Then the river had a number of small streams flowing into it from Epsom and Ashstead Commons which, added to the springs, gave it its industrial strength. It was during the eighteenth century that clay-working on the commons for the manufacture of bricks, and increased ploughing as land was taken up for agriculture, caused the balance of water supply to the Hogsmill to be affected. Local historian, Cloudesley Willis, writing around 1930, said that the flow of the Hogsmill, measured at the Upper Mill in Ewell, was four and a half million gallons a day. Increased pumping of water from boreholes in the chalk has caused the flow to diminish considerably from this figure in recent years.
- 2.19 Three of the five mills in Kingston mentioned in the Domesday Book were in the Hogsmill River - Hoggs Mill, Middle Mill and Leatherhead Mill. The only remaining evidence of these former mills in Kingston are the mill leat and island at the end of Mill Street and the eighteenth century Mill House on the banks of the river in Villiers Road which was once adjacent to "Leatherhead Mill". The two mills in

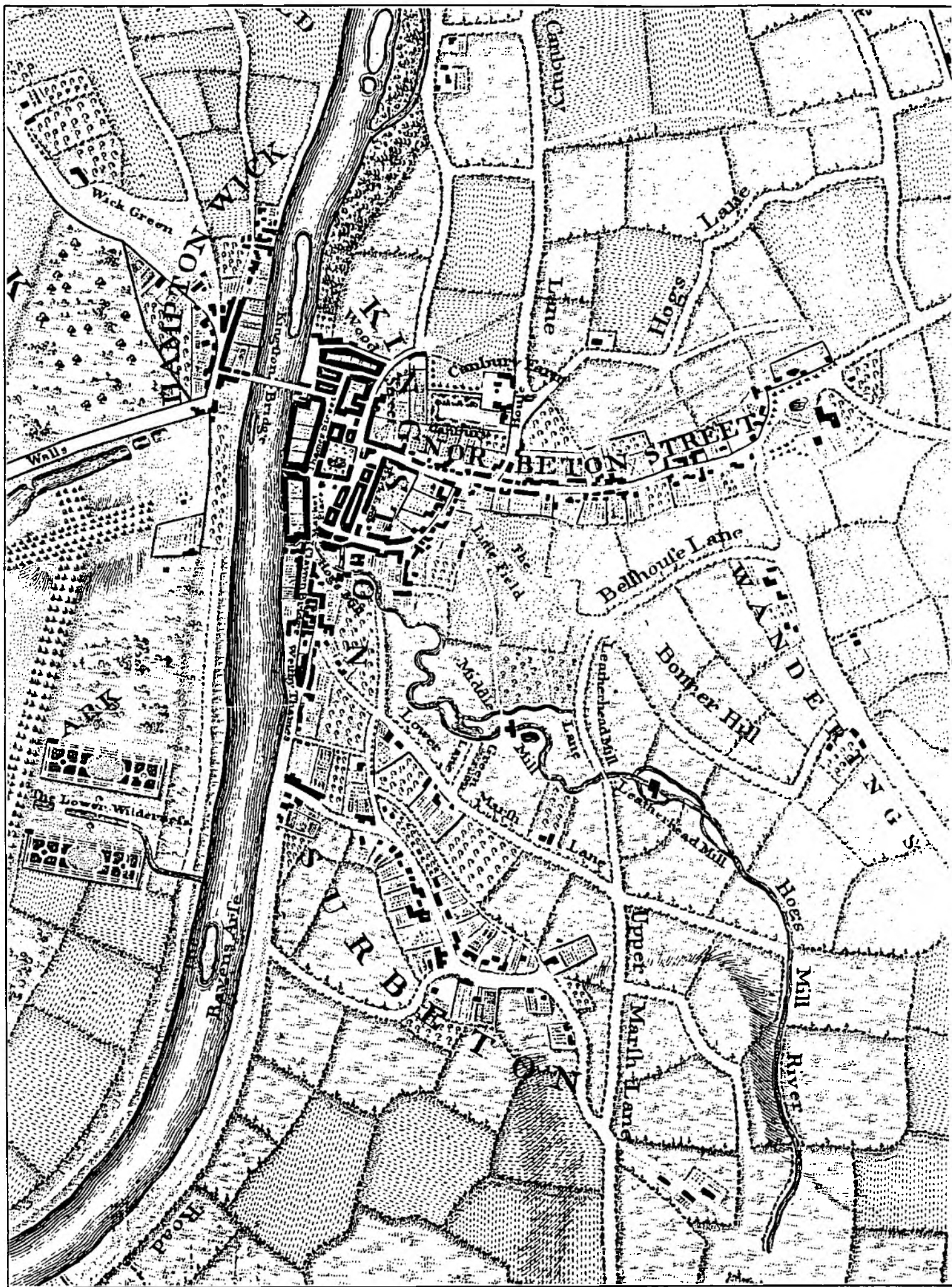


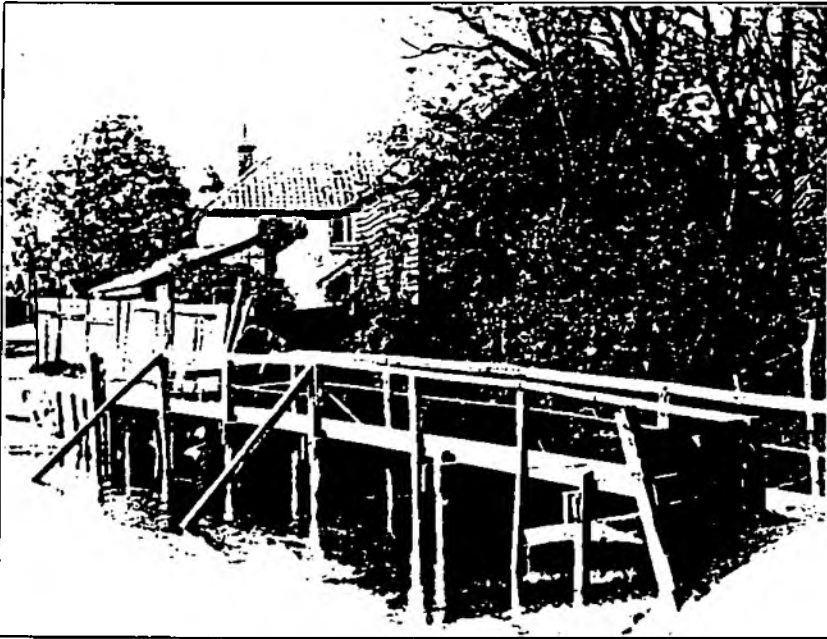
Figure 2.3 Rocques Map of Kingston-upon-Thames 1741

Ewell mentioned in the Domesday book are still visible, although their commercial days have long since passed. Early photographs of the mills obtained from the archives at the Kingston Heritage Centre and Epsom and Ewell library are shown on Figure 2.4.

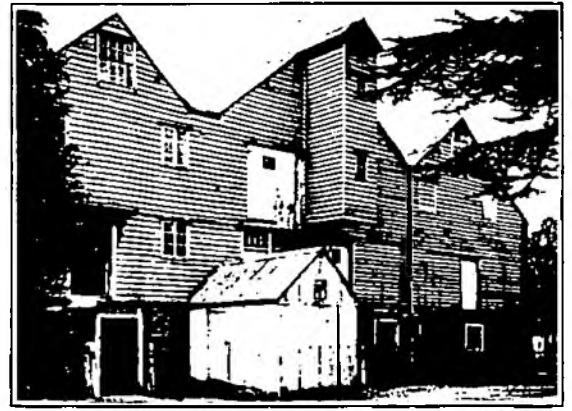
- 2.20 The Hogsmill was used to drive a number of other mills between Ewell and Kingston. Malden Mill, which was situated about one and a half kilometres below Old Malden church, was also mentioned at Domesday. It was originally a corn-mill but, like the mills in Ewell, was converted to the manufacture of gun powder during the early years of the nineteenth century. The Hogsmill gunpowder mills were notorious for the explosions which happened regularly. In 1812 an explosion at the gunpowder mills, near Ewell, was heard as far away as Horsham.
- 2.21 A mill at "Cisendone" is also mentioned in the Domesday survey and was probably located on the Bonesgate Stream near Castle Hill, Chessington. The earthworks at Castle Hill are believed to be the remains of a medieval hunting lodge and are a scheduled ancient monument.

The Arrival of the Railways

- 2.22 Until the nineteenth century the Hogsmill catchment was essentially an agricultural landscape, the only settlements of any size being Kingston and Ewell, both of which largely retained their historic street pattern. Away from these two compact towns, other isolated settlements were no larger than small villages. Malden stood on a hill overlooking the east bank of the Hogsmill and Chessington was even smaller, standing on a hill of lighter gravel soils near the Bonesgate Stream. The heavy clay soils were unsuitable for arable crops and it is likely that commons and pasture predominated until the Enclosure Acts and the coming of the railways during the first half of the nineteenth century.
- 2.23 Norbiton and Surbiton Commons which surrounded the old town centre of Kingston, were divided and allotted for development by 1838 when Surbiton station was opened 2 kilometres south of Kingston, on the London to Southampton railway line.
- 2.24 In 1846 a station was opened at New Malden to the north of the existing village of Malden, the latter henceforth being known as Old Malden. The railways came to Ewell in 1847 when the station known as Ewell East was opened on the London, Brighton and South Coast Railway. The Ewell station of the London and South Western Railway, now known as Ewell West, opened when the line from Raynes



The bridge over the Hogsmill at Villiers Lane, Kingston (formerly Oil Mill Lane) in 1890.



The Upper Mill in Kingston Road seen here in 1929, was built in the 18th century. It was restored in 1984.



The bridge over a branch of the Hogsmill River near Ewell Court is known as the Packhorse Bridge and is thought to be 18th century. This photograph was taken shortly before the Second World War.



Ruxley Splash in Ewell seen here in 1915, was the ford where Ruxley Lane crossed the Hogsmill River.

Figure 2.4 Early photographs of the Hogsmill

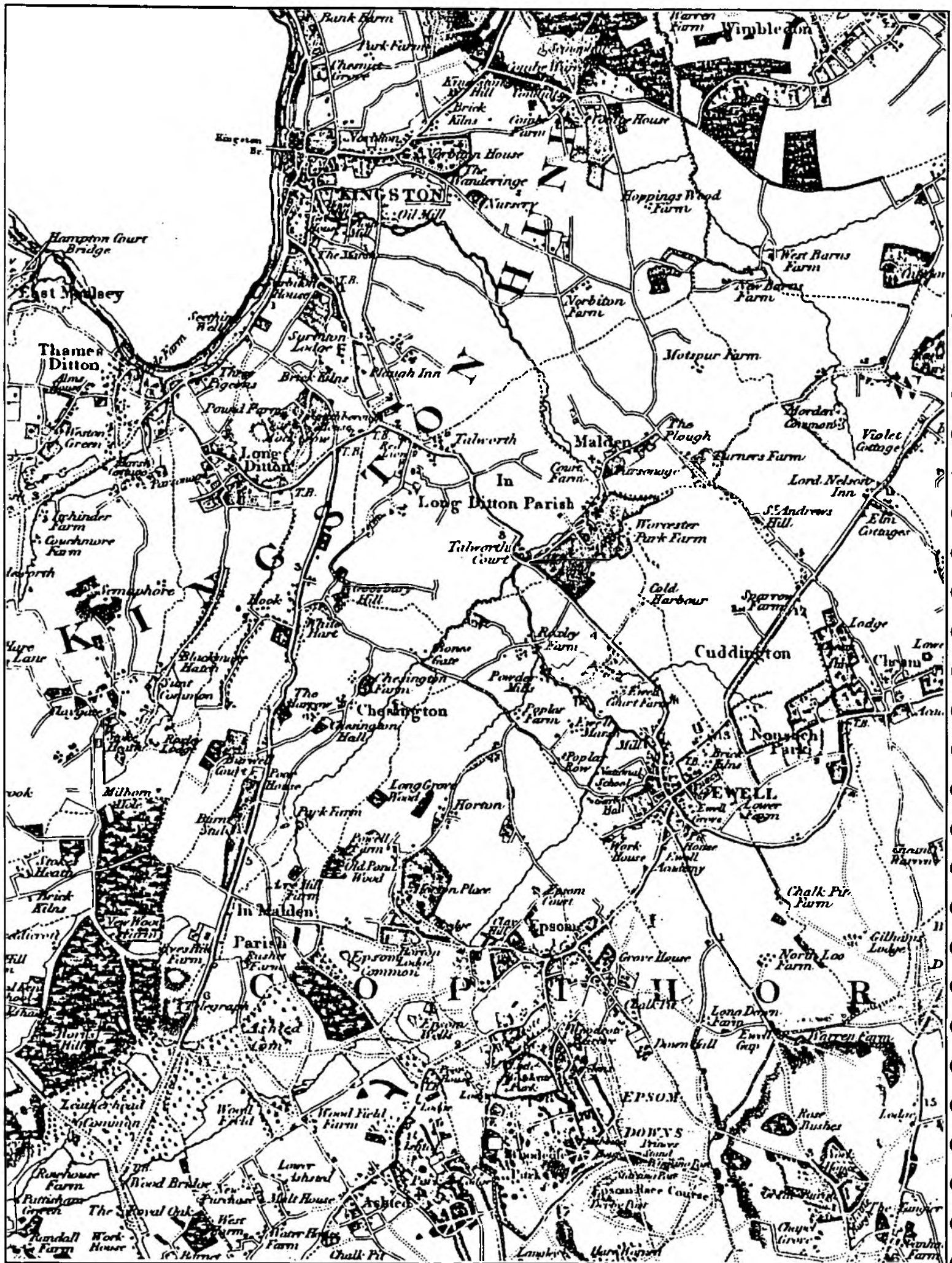


Figure 2.5 O.S. 1st Edition

Park to Epsom was commissioned in 1859. The arrival of the railway triggered a period of rapid development and transformed what were previously small villages, as in the case of Surbiton and Malden, into commuter suburbs.

- 2.25 Local councillors in Kingston, coupled with coaching interests, originally objected to the railway running through the town, and this was the reason for it being forced south of the town to Surbiton. The success of the railway made them reverse their decision and in 1863 the railway finally came to the town in the form of a branch line via Twickenham. In 1869 the line was continued to New Malden to provide a direct line to London. Kingston itself remained quite small with development mainly to the east towards Norbiton, and open land remained around the Hogsmill River.

The Pre-Raphaelite Artists

- 2.26 In the mid-nineteenth century the Pre-Raphaelite painters John Millais and Holman Hunt used the countryside, around what is today the suburbs of Worcester Park and West Ewell, as the setting for a number of paintings. The artists stayed with the Lempriere family in Ewell before finding lodging at Worcester Park Farm nearby. Millais selected the garden wall of the farm for his picture 'The Huguenot' and he also chose another local setting, one of the fields at Ewell Castle, for his picture 'The Death of Ophelia' (see Figure 2.6). It is said that he modelled the weeping willow in the picture on a tree found beside the Hogsmill. Holman Hunt, was also attracted to the banks of the Hogsmill, which became the setting for his painting 'The Hireling Shepherd'. Another site chosen by Hunt was nearer Ewell village, where he noticed a little hut that had been used in connection with the old powder mills on the Hogsmill. It was this little hut that formed the background for his famous painting 'The Light of the World'. These important cultural associations are explained on the new signboards installed by the Royal Borough of Kingston within the Hogsmill River Park. There are no comparable interpretative facilities within the Borough of Epsom and Ewell.



Figure 2.6 The Death of Ophelia by Sir John Millais

Twentieth Century Suburban Development

- 2.27 The opening of the Kingston Bypass in 1927 generated ribbon development on both sides of the road in New Malden, Tolworth and to the north of Hook. At this time, however, the valleys of the Hogsmill and its tributary, the Bonesgate Stream were largely undeveloped. To the south of the new bypass old Malden, Hook and Chessington were small villages until the construction of the Chessington line from Motspur Park began in 1936. This resulted in a rapid period of house building just before the Second World War. Development extended up to the edge of the flood plain of the Hogsmill River, which largely remained as meadows, until transformed into public open space. Sports grounds were laid out on the river terraces adjoining the Hogsmill.
- 2.28 It was not until the imposition of Green Belt policies in the post-war years that a halt was called to speculative house building. The Green Belt has protected the southern sections of the Bonesgate Stream from development and the designation of Metropolitan Open Land has prevented the coalescence of Ewell and Tolworth. In the 1960s and 1970s planned housing development within the Longmead district of West Ewell infilled the remaining pockets of farmland on the west bank of the Hogsmill. Trading estates and depots were also sited along the river and its tributaries.

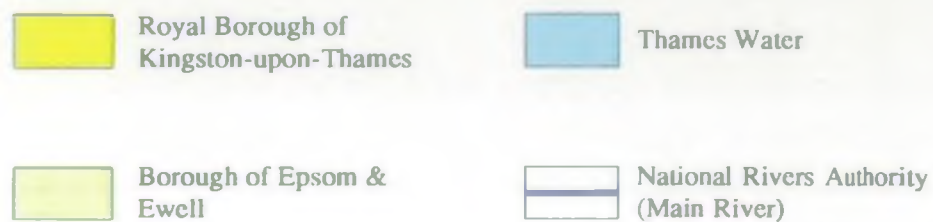
Land Drainage and Flood Defence Schemes

- 2.29 Over the centuries, piecemeal land drainage schemes have straightened and modified all of the Hogsmill River. The most recent major changes to the river have resulted from the extensive land drainage and flood alleviation schemes implemented by Surrey County Council in the 1950s. A series of acts were passed in the 1940s and 1950s to implement land drainage and flood defence works. Our research has identified no reason for such major capital works!
- 2.30 Schemes were prepared for all of the watercourses within the catchment and implemented in a number of phases. It is believed that Polish war refugees staying at the Horton Hospitals were used as labour. These schemes completely changed the riparian landscape of the Hogsmill and its tributaries. Its largely natural meandering course was replaced by a straight, over wide channel typically constrained by toe boarding. The abundance of step weirs is probably a result of channel straightening and the consequent need for gradient adjustment. The only sections of watercourse not to be altered were the upper and middle reaches of the Bonesgate Stream.
- 2.31 During the late 1950's, the Hogsmill sewage treatment works were reconstructed incorporating the Malden and Coombe Sewage Works to the north-east of the river and the Surbiton Sewage Works to the south, into a much larger area. This required the complete realignment of the river within a new cutting. The final section of the river downstream of the sewage works within Kingston town centre was placed within a wide vertical walled channel.

Land Ownership

(See Figure 2.7)

- 2.32 All of the river bed and banks of the Main River from the Lower Mill at Ewell to its confluence with the Thames at Kingston are owned by the NRA. None of the tributaries are owned by the NRA. The Royal Borough of Kingston Upon Thames owns all of the public open space adjoining the river within its boundaries, together with Tolworth Court Farm and Kingston Cemetery. The Borough of Epsom and Ewell owns the public open space adjoining the river from its source to the confluence with the Bonesgate Stream, together with the Green Lanes Stream and Horton Country Park. Other major landowners are Thames Water who own the Hogsmill Sewage Treatment Works and Merton College who own Park Farm in the upper and middle reaches of the Bonesgate Stream.



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3. NATURE CONSERVATION VALUE

- 3.1 It is beyond the scope of this study to undertake new research into the nature conservation value of the river. This summary is included to provide a context for the management strategies and detailed assessments later in this report. It has been based on the Biological Survey and River Corridor Surveys undertaken by the NRA and a review of other published wildlife habitats surveys.
- 3.2 The recent study, undertaken by the London Ecology Unit for the Royal Borough of Kingston Upon Thames, has been an invaluable source of information. The Unit has graded sites within The Royal Borough of Kingston into Sites of Metropolitan Importance, Sites of Borough Importance (Grade I and II) and Sites of Local Importance. All of the Hogsmill River within the Royal Borough, except for the town centre, is graded as a Site of Borough Importance, as is the Bonesgate Stream. Further details on the nature conservation value of different sections of the watercourse and the London Ecology Unit gradings are given on the detailed assessment sheets (Figures 7.2 to 7.14). A summary of the London Ecology Unit gradings are shown on Figure 3.1.

WILDLIFE HABITATS ADJACENT TO THE RIVER

- 3.3 The Hogsmill River and its tributaries form relatively continuous areas of open space, which act as 'green corridors' through the built environment linking the Thames in Kingston with the Green Belt land in the south. These ribbons of open land are largely managed as informal public open space. Habitats represented include woodland, neutral grassland, hedgerows and riverine communities.

Woodland

- 3.4 The Bonesgate Stream runs alongside Chessington Wood and through the woodland at Castle Hill. Oak dominates the canopy in both of these woodlands, which are on damp clay soils. Linking these two woodlands, the Bonesgate Stream winds its way through the Green Belt between mostly wooded banks. The combination of steeply incised clay banks and the shade cast by trees along much of the stream's length has restricted the ground flora and aquatic plants. This is quite natural for such a small headwater stream.
- 3.5 The Hogsmill River passes through a number of small woodlands. The most continuous stretch of woodland lines the river south of the Riverhill Estate. The

main area of woodland occupies the site of the former house and is very mixed. Oaks dominate and there are some very old specimens which may be relics of ancient woodland. Amongst the oaks are obviously planted specimens including Lombardy poplar and giant redwoods. Along both banks of the river is a strip of woodland, mainly composed of sycamore, but also containing mature crack willow. The dense shade cast by the trees has restricted the development of aquatic vegetation in this section, but the overdeepened channel morphology with steep marginal banks is a more important factor. Another significant wooded section is the former gunpowder mill near Ewell Court.

Grassland

- 3.6 Constraints on development within the flood plain of the Hogsmill has meant that the meadows and pastures alongside the river were not built upon during the rapid expansion of the suburbs in the 1930s. Many of these meadows and pastures, including their old hedgerows, have survived. There is an almost uninterrupted belt of grassland-dominated open space alongside the river, from Ewell extending north as far as Kingston Cemetery. 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.
- 3.7 The parks departments, in both the Royal Borough of Kingston and the Borough of Epsom and Ewell, have in the past ten years varied the mowing regimes which has resulted in the development of botanically-rich meadows.
- 3.8 The most botanically-rich examples of neutral grassland can be found at Tolworth Court Farm. The farm runs along the northern boundary of the Bonesgate Stream close to its confluence with the Hogsmill. This site is of both archaeological and ecological interest and consists of a field system with neutral grassland, criss-crossed by old hedges and small blocks of woodland. The fields were managed until recently as hay meadow or rough pasture. Other species-rich grasslands are found in the grazed paddocks and unkept field margins to the north of the medieval moated site at Tolworth Court Farm and beside Riverhill House.

Hedgerows

- 3.9 The fields prior to the suburban development in the late nineteenth and twentieth centuries were generally narrow and arranged at right-angles to the river, which ensured access to the river for each owner. Many of these former hedgerows are

still visible or can be traced, for example near Old Malden. The hedges at Tolworth Court Farm are very old indeed and include field maple and hazel, both of which are poor colonisers and are rarely found in hedges of post-Tudor age.

BIOLOGICAL SURVEY OF THE RIVER

- 3.10 The biological quality of a site is shown by the number of different macroinvertebrates present and by the balance between pollution-sensitive and pollution-tolerant types. The Biological Monitoring Working Party (BMWP) score is the index used by the NRA to assess biological quality and monitor water quality.
- 3.11 The biological quality survey identified that, overall, most of the watercourse length is of 'fair' biological quality using two-season aggregate BMWP scores. A section of the Hogsmill achieved two-season BMWP scores consistently above 100 which are high for a watercourse in an urban location. Particular groups of animals, notably snails, water beetles, water bugs and some dragonflies were generally well represented in the River Hogsmill, especially where there were marginal growths of emergent plants. However, throughout the catchment there was a scarcity of the more sensitive macroinvertebrate families which are characteristic of cleanwater rivers and streams.
- 3.12 The section of the Hogsmill between the Green Lanes Stream and Worcester Park achieved 'good' biological quality. Thirty-five different macroinvertebrate families were recorded from this section. This reflected reasonable water quality and a quite diverse channel form (particularly in the section above the Bonesgate Stream confluence) with well developed stands of emergent plants. A site in this section located just below the river's confluence with the Green Lanes Stream produced the highest BMWP score in the survey (BMWP = 144). The biological quality at this site was significantly higher than a site located just above the Green Lanes Stream less than 100 metres upstream (BMWP - 85). The top section of the Hogsmill dried completely during 1990/91 but recolonisation by macroinvertebrates has been swift.
- 3.13 The channelised, concrete sections of the River Hogsmill through Kingston and a section of the Surbiton Stream have very low biological potential. In such watercourse the lack of substrate for rooting prevents establishment of aquatic plants, which are a habitat for macroinvertebrates and fish. Riverine sediments (boulders, gravels, sands and silts) are also a habitat for burrowing macroinvertebrates, which usually constitute a large proportion of the community and include animals of ecological importance (e.g. shrimps, worms and pea mussels). High peak flow

velocities through concrete channels may also wash out any temporary substrates, plants or animals.

- 3.14 The survey found a difference in biological quality between two sites located below Hogsmill STW with contrasting channel characteristics but identical water quality. At a site within the trapezoidal concrete section biological quality was 'poor' (BMWP = 44). A site located 100 metres upstream which had a 'natural' riverbed (gravel and boulders) and the submerged roots of bankside trees produced higher biological quality (BMWP = 79). The additional macroinvertebrates included damselflies, water scorpion and several water beetles and bugs.
- 3.15 The Horton Stream produced the best BMWP score of any tributary (BMWP = 106 above Hogsmill). Most of the tributaries were of 'fair' biological quality. In the case of Green Lanes Stream (BMWP = 84 above Hogsmill) and the Surbiton Stream (BMWP = above the Hogsmill) which both receive large volumes of urban run-off, this is notable.
- 3.16 The Bonesgate Stream, which benefits from a rural location and natural channel through much of its length, supported a disappointing fauna, particularly in its lower reaches (BMWP = 56). Factors which may have limited the macroinvertebrate fauna of the lower parts of this brook include general urban run-off and discharges from the Cox Lane Industrial estate. In its upper reaches the stream achieved more respectable biological quality (BMWP scores = 85 and 93) but may be affected by discharges from the Chessington World of Adventure, an industrial estate and general agricultural enrichment in this vicinity.

RIVER CORRIDOR SURVEY

- 3.13 The following table summarises the key ecological, morphological and other features of interest identified in the river corridor survey undertaken between September and October 1993. The table only highlights features that are above the ordinary background level. The locations of the individual river corridor sections are shown in Figure 3.1

RIVER CORRIDOR SURVEY

Ecological Interest	Other Interest
BONESGATE STREAM (BGS)	
<p>BGS 004-010 are semi-natural mobile eroding channels. BGS 006 and 007 has frequent woody debris in the channel, creating a weir effect. BGS 005-009 have low-lying mud shelves. Generally very little in-stream vegetation, <i>Potamogeton crispus</i> occurs in BGS 002, <i>Veronica beccabunga</i> occurs in BGS 005 and 008, which also has <i>Apium nodiflorum</i>, <i>Phalaris arundinacea</i>. Generally species rich wooded banks. <i>Salix fragilis</i> and weeping willow (<i>Salix sp.</i>) pollards occur on BGS 001. BGS 008 has grazed, ditch-like channel with natural ponding on the RS.</p>	<p>Short riffle sequences throughout, with frequent short riffle sequences in BGS 004 and 006. River cliffs occur in BGS 003, 005; 008-010. BGS 001-004 has Public Open Space; Castle LNR occurs on BGS 004-005; Chessington Wood NR occurs on BGS 009-010; Moor Lane Nature Conservation Area occurs in BGS 004. Toe-boarding occurs on BGS 001 and 002.</p>
GREEN LANES STREAM (GLS)	
<p>Extensive and diverse channel vegetation, including <i>Eleocharis sp.</i>, <i>Apium nodiflorum</i>, <i>Rorippa nasturtium-aquaticum</i>, <i>Polygonum amphibium</i>, <i>P. arundinacea</i>, <i>Epolobium hirsutum</i>, (GLS 001-002) with additional <i>Scrophularia auriculata</i> and <i>Lucopus europaeus</i> on GLS 001. Low-lying shelves occur on GLS 002-003.</p>	<p>Frequent short riffle sequences throughout, exposed gravels occur on GLS 002 and pools associated with weirs occur on GLS 001. Predominantly flows through a wide corridor of amenity grassland with trees and shrubs. Public Open Space with wooded pockets occurs on GLS 001. Toe-boarding occurs throughout the stream.</p>

HOGSMILL RIVER (HOG)

Extensive and varied emergent vegetation occurs in section HOG 019. Extensive and diverse emergent and aquatic vegetation occurs on HOG 017 and 020. Relatively extensive and diverse aquatic vegetation occurs on HOG 19. Extensive but non-diverse vegetation occurs on HOG 007-008. Low-lying shelves with rich channel vegetation occurs on HOG 105-017. In addition shelves also occur on HOG 004, 006, 008, 009, 014 and 017. *Potamogetan berchtoldii*, a scarce species in the Greater London Area occurs on HOG 019. *P. pectinatus* occurs on HOG 014 and 019. HOG 005-006 has a S.T.W.; a transitional marshy grassland community with ditches, and woodland occurs on HOG 008. *Carex acuta*, a scarce species in Greater London Area and *Phragmites australis* occurs in the marshy grassland community. Remnant hedgerows and semi-improved acid grassland occur on HOG 010. *P. australis* and natural ponding in woodland occurs on HOG 018. Varied and extensive wet woodlands and ditches occur on HOG 019-020, with notably *Corylus avellana* coppice and *Carex pendula*.

Short riffle sequences occur throughout, frequent short riffle sequences occur on HOG 010, 014 and 018. HOG 002 has long riffle sequences and exposed gravels within a predominantly artificially banked channel. HOG 012 has exposed gravels. HOG 005 has a river cliff. pools occur on HOG 002, 008-010, 012 and 018. A small wooded island occurs on HOG 020. Public Open Space occurs on HOG 006-1-1, 014-019; Tolworth Court Farm and moat occurs on HOG 013-014; Hogsmill Wood Reserve occurs on HOG 009. Disused sludge beds occur on HOG 005-006; disused sludge beds occur on HOG 005-006; disused allotment site and nursery site occur on HOG 011 and 012. Artificial banks and toe-boarding occur throughout.

HORTON STREAM (HRS)

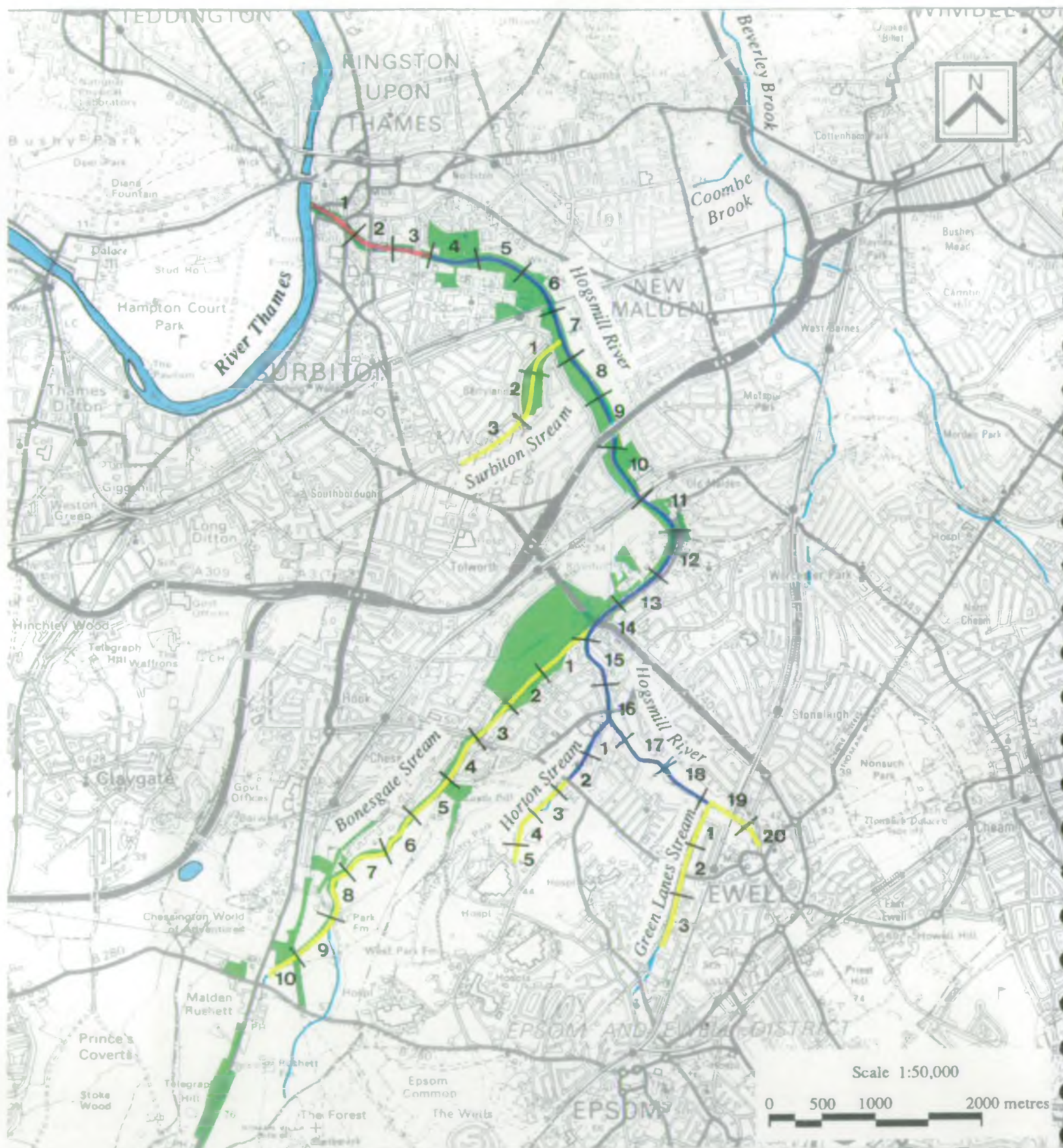
Wooded semi-natural channel occurs on HRS 002 and in the upstream part of HRS 001. Wet neutral grassland occurs on HRS 003. Low-lying mud shelves occur on HRS 001. *Agrostis stolonifera* occurs on HRS 004 and *Juncus effusus* occurs on HRS 003.

Short riffle sequences occur on HRS 001-002. A pool associated with a weir occurs on HRS 003. Artificial banks and toe-boarding occur on HRS 001-002. HRS 002-005 flows through Horton Country Park and Golf Course. Ornamental lakes with introduced *Gallinule longus* and Bogbean (*Menyanthes trifoliata*) occur on HRS 003. HRS 005 not found.

SURBITON STREAM (SUR)

Species rich wooded bank on SUR 003.

Short riffle sequences occur throughout, with exposed gravels on SUR 001, 003; and low-lying shelves on 001-002. Flows through Public Open Space. Derelict allotments and Edith Gardens LNR, occur on SUR 003. Artificial banks form a dominant feature of the stream.



 Site of Nature Conservation Importance
Royal Borough of Kingston upon Thames

 Location of NRA River Corridor
Survey Sections

Biological Quality
BMWP Biotic Classes:

A	Very good (>150)
B	Good (101 - 150)
C	Fair (51 - 100)
D	Poor (20 - 50)
E	Very poor (0 - 19)

Figure 3.1 River Corridor Survey and Biological Quality

4. PLANNING CONTEXT

INTRODUCTION

4.1 The Hogsmill River catchment falls largely within two districts - the Borough of Epsom and Ewell in the County of Surrey and the Royal Borough of Kingston upon Thames which lies within Greater London. The majority of the Hogsmill catchment lies within Kingston borough and the Hogsmill River and Bonesgate Stream form the administrative boundary between the two boroughs in the Hook/Tolworth/West Ewell area. This section describes the relevant local planning policies in the two boroughs. Strategic planning policy designations are illustrated on Figure 4.1. Figure 4.2 shows Sites of Archaeological Importance, Conservation Areas and Scheduled Ancient Monuments.

4.2 The local plans considered in this section are:

- the Royal Borough of Kingston upon Thames Unitary Development Plan - Deposit Version and Changes (March 1992); and
- the Epsom and Ewell Borough Local Plan - Deposit Draft and Changes (August 1992).

ROYAL BOROUGH OF KINGSTON UPON THAMES

Open Land and Riverside

4.3 Within the borough of Kingston, a large majority of the Hogsmill River and all of the Bonesgate Stream is located in open land. To the south of Chessington, open land is designated as Green Belt. This Green Belt designation continues into Surrey. Within the Green Belt there is a strong presumption against development except for that which is essential for agriculture or forestry, outdoor sport and recreation, cemeteries and institutions within extensive grounds. Within the built-up area, all open land around the Hogsmill is designated as Metropolitan Open Land.

4.4 The Kingston UDP gives a high priority to safeguarding both Green Belt and Metropolitan Open Land. UDP Policy OL1 states:

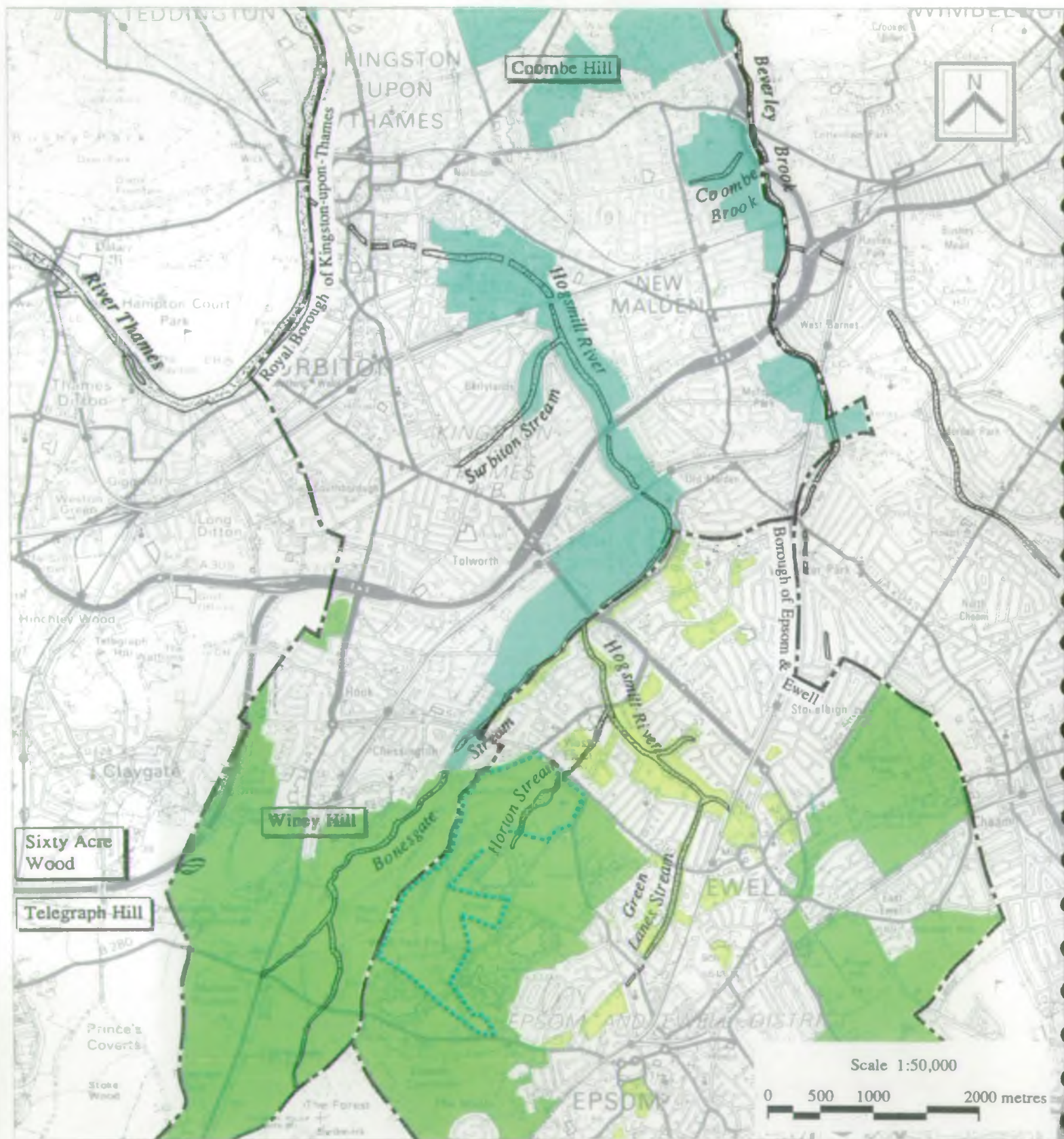


Figure 4.1 Strategic Planning Policy Designations

"Within the Green Belt and areas of Metropolitan Open Land, as defined on the proposals map, the predominantly open character of the land will be safeguarded and built development will be resisted".

4.5 Such an approach conforms with, and is backed up by strategic planning policies for Greater London as prepared by the London Planning Advisory Committee, and national planning policies as defined by the Department of the Environment in Planning Policy Guidance Note 2.

4.6 Policy STR15 'Protecting Landscape and the Riverside' states that key landscape features will be protected. The policy states:

"River corridors will be promoted as important areas of land by conserving existing areas of value within them and seeking the restoration and enhancement of the natural elements of the river environment".

4.7 Specific support for environmental improvements in areas of Green Belt and Metropolitan Open Land is provided by Policy OL6 which supports initiatives to improve the appearance and utility of these areas, and to enhance areas of wildlife value. Specific measures considered appropriate in these areas include:

- planting and other landscape works;
- removal of rubbish and other eyesores;
- retention, conservation and management of natural features;
- the use of derelict land, for example for nature conservation purposes.

Recreation and Nature Conservation

4.8 The Borough Council support the provision of additional outdoor recreation facilities, particularly at King George's Field and Tolworth Court Farm. The Hogsmill River flows through Tolworth Court Farm. This support is contained in Policy RL1. Open land in the Hogsmill River corridor generally contains a number of sports and recreation grounds.

4.9 Policy STR31 of the UDP seeks "the provision of a comprehensive network of pedestrian routes interlinking centres, residential areas, open spaces and riverside walks". The plan recognises the opportunities provided by development schemes for the creation of improved pedestrian routes.

- 4.10 Although there are some existing footpaths in the vicinity of the Hogsmill River, the deficiencies in this network are recognised and some new sections of footpaths are proposed (Policy OL14).
- 4.11 The UDP designates a number of Sites of Nature Conservation Importance. Much of the open land around the Hogsmill River is classified as being of Nature Conservation Importance. Policy OL11 states that there will be a presumption against development of these sites and the Council will take into account the 'local ecological balance' in considering development proposals. Through this policy, the Council also seeks to promote:
- a positive approach to ecological management of land;
 - the provision of nature trails and other recreation facilities associated with nature conservation;
 - the protection of areas considered suitable as nature reserves;
 - the dissemination of information and advice on nature conservation matters.
- 4.12 Within the overall classification of Sites of Nature Conservation Importance, the Hogsmill Valley, Hogsmill Valley Sewage Works, Castle Hill, Bonesgate Open Space and Tolworth Court Farm are defined as Sites of Borough Importance (Grade 1). This is the second most important category in the hierarchy of nature conservation sites in the borough. The Sites of Nature Conservation Importance relate very closely to the London Ecology Unit gradings and are shown on Figure 3.1.
- 4.13 Kingston Borough as a whole contains known historic centres, archaeological sites and locations where finds have been made. This information, together with areas of topography which are likely to have been attractive for early settlement, have been used to define a number of Areas of Archaeological Significance. Significant areas of open land around the Hogsmill River are designated as Areas of Archaeological Significance; these are shown on Figure 4.2. UDP Policy UD27 defines the Council's approach to such areas where priority is to be given to the preservation of archaeological remains in situ. The Hogsmill River also flows through Old Malden Conservation Area.

Kingston Town Centre

- 4.14 The Hogsmill River lies within, or in close proximity to three conservation areas in the town centre: Kingston Old Town, Fairfield/Knights Park, and Grove Crescent. There are a number of listed buildings within the town centre. The Council will give

special attention to the design of development proposals within or adjoining such areas (Policy UD2). The further downstream section of the Hogsmill also falls within the historic core of the town.

- 4.15 UDP Policy STR34 provides for the implementation of a townscape strategy. The strategy involves the 'greening' of a network of landscaped links and spaces, including the riverside and enhancement of conservation areas.
- 4.16 Policy KTC26 deals specifically with riverside walks:

"The Council will secure completion of a public riverside walk between Queens Promenade and Canbury Gardens including a bridge over the Hogsmill and a continuous public walkway alongside the Hogsmill in the town centre. Additional and improved pedestrian links to the riverside will be sought. Redevelopment proposals adjoining proposed riverside walkways should incorporate proposals for the walk and should incorporate functional, physical and visual links between the development and the walk".

Proposal Sites

- 4.17 Outside the town centre, the UDP identifies four Proposal Sites which are adjacent to the Hogsmill River. Three such sites are identified within the town centre. Brief details of these sites are included in Table 4.1 and shown on the detailed assessment sheets, Figures 7.2 to 7.14. Proposal sites may present opportunities for improvements to the Hogsmill River and surrounding land. At this stage no timetable for development of these sites can be estimated.
- 4.18 In addition to sites proposed for development in unitary development of local plans, planning applications may be submitted for sites which have not necessarily been identified, adjacent to the Hogsmill River. New development schemes can have important impacts on the Hogsmill River, of a positive or negative nature. An example of such a scheme is the current (September 1993) application for student residences at Middle Mill House Works on Hogsmill Island. This scheme is a slight revision of an earlier scheme refused planning permission by the Borough Council, which is to be the subject of an appeal. The scheme contains 11 students 'houses' comprising 40 flats and car parking in a landscaped setting.

TABLE 4.1 : PROPOSAL SITES - KINGSTON BOROUGH

UDP Ref No.	Site Name and Size	Existing Use	Appropriate Uses	Comments
TOWN CENTRE SITES				
4	High Street/ Emm's Passage/ King's Passage/ Market Place 1.09 ha	Shops Offices Restaurants Parking Vacant	Riverside Walks Mixed uses including leisure, retail, residential, service yard, offices, craft workshops etc	A number of planning constraints are in force including Tree Preservation Orders, a listed building, and the conservation area. New vehicular access to link the two parts of the site would require a bridge across the Hogsmill.
29	Guildhall 1/County Court Complex/Bath Passage/St. James Road 1.66 ha	Courts Civic Uses Retail Public Conveniences	Creation of a single identifiable civic complex. Limited office use	There are numerous constraints to redevelopment, including relocation and/or retention of existing uses. New development could span the Hogsmill River but important pedestrian routes through the site must be maintained. There are a number of heritage issues which need to be addressed.
32	1 Penrhyn Road 0.19 ha	Car repairs and showroom	Residential	The site borders the southern side of the Hogsmill and a riverside walk could be included in any redevelopment scheme.
OTHER SITES				
34	Refuse Transfer Station and Land r/o Athelstan Road 3.60 ha	Refuse Transfer Station Civic Amenity Site Ambulance Station Derelict Land	Refuse Transfer Station and general industry (B2/B8)	Presents opportunity for improving appearance of the site from Hogsmill and recreation ground.

UDP Ref No.	Site Name and Size	Existing Use	Appropriate Uses	Comments
37	Sewage Treatment Works north of Hogsmill River, New Malden 6.47ha	Vacant	Recreation facilities, riverside walk	Development, including landscaping should be considered in relation to the adjoining recreation ground. The appearance of this Metropolitan Open Land should be enhanced as should the nature conservation potential of the site. Site reclamation costs are a key constraint.
38	California Road Depot and adjoining land, New Malden 4.15 ha	Part Council depot, part industry, part vacant	B8, B2 or B1 uses	Presents opportunity for improving appearance of the site from Hogsmill.
73	Tolworth Court Farm/Jewish Cemetry Land, Jubilee Way, Tolworth 59.72 ha	Agriculture, limited residential, public amenity, Hogsmill Walk	Open recreational activities, sports pitches, riverside walk, nature trails and nature reserves	The site presents an opportunity for more beneficial community use. The existing environmental/ecological value should be maintained and enhanced. A 'missing link' in the Hogsmill riverside path could be completed.
61	Land adjacent to Berrylands Park, Raeburn Avenue	Open land Limited residential	Recreation, residential including affordable housing, community uses	Proximity of MOL and park is important, also TPO on site. New access required. Green corridor required either side of the stream with improved pedestrian links
68	Tolworth Main Allotments, Surbiton 8.57 ha	Allotment gardens (30-50% in use)	Allotments, new sports facilities, residential including affordable housing	Landscaping along Surbiton Stream required. Comprehensive scheme required for this site

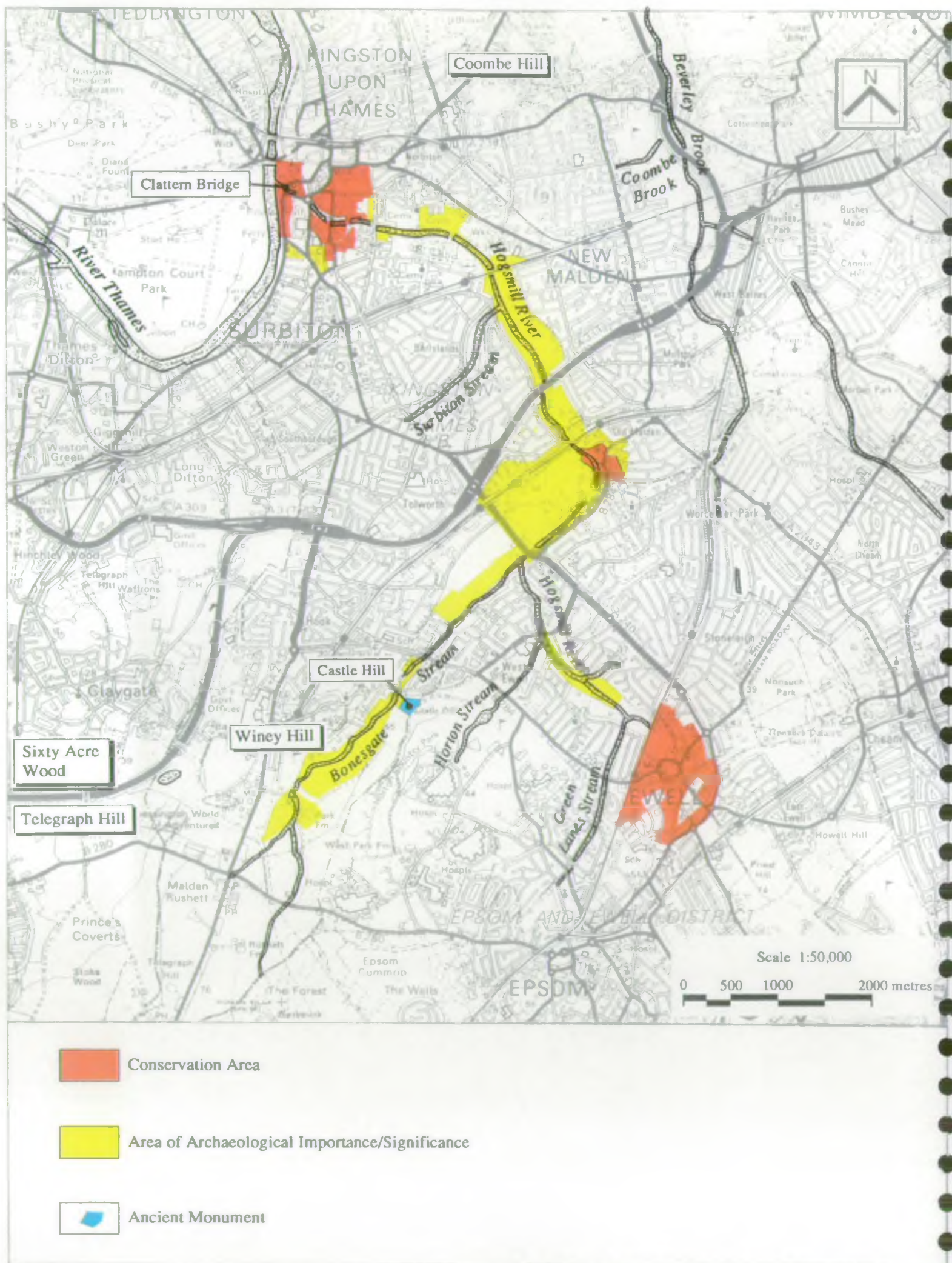


Figure 4.2 Sites of Archaeological and Historical Interest

BOROUGH OF EPSOM AND EWELL

Green Belt

- 4.19 Green Belt encompasses some 42% of the total area of the Borough, and stretches from Chessington Road in the west through Horton Country Park and the hospital lands, Epsom Common, Epsom and Walton Downs, North Looe and Priest Hill to Cheam Road in the east. To the west, there are broad links with Green Belt in Kingston and beyond, in Elmbridge borough.
- 4.20 Within the Green Belt, strict control will be exercised over the types of uses which may be permitted. This approach is similar to that adopted in the Borough of Kingston and, again, follows the principles laid down in Planning Policy Guidance Note 2. Slightly different circumstances apply to the Epsom Hospitals Cluster and this is described separately below. The Borough Councils approach to the control of development in the Green Belt is contained in Policies GB2, GB3 and GB4. Any new development permitted within the Green Belt will be controlled so as to have no adverse effect on landscape quality. The design, scale and siting of new development are therefore important considerations.

Open Space and Recreation

- 4.21 The Borough Local Plan notes the importance of the many local open spaces which do not perform a Green Belt function, but which nevertheless make an essential contribution to the amenities of the Borough. Such land may be publicly or privately owned. The Local Plan therefore designates this type of land as 'Open Spaces in Urban Areas' which are protected by Policy OSR1. Virtually all open land adjacent to the Hogsmill (and its tributaries) within the built-up area is so designated. The Council will not normally permit development in these areas unless it:
- is ancillary to an open use of the site;
 - involves replacements or additional recreation or amenity facilities;
 - is related to retention of playing fields, provision of site car parking, nature conservation, landscape or tree protection.

The Natural and Built Environment

- 4.22 There are no designated sites of nature conservation value adjacent to the Hogsmill River or its tributaries within the Borough of Epsom and Ewell. Policy NE11 of the

Local Plan explains that the Council will continue its programme of tree planting in public open spaces. Under Policy NE14, new development will be required to include landscaping schemes which retain and enhance features of nature conservation or landscape value.

- 4.23 Local Plan Policy NE27 deals specifically with watercourses and states:

"The Borough Council will liaise with the National Rivers Authority to secure the maintenance, conservation and enhancement of the natural environment of watercourses throughout the plan area".

- 4.24 Part of the Hogsmill lies within the Ewell Village Conservation Area which was originally designated in 1972. Under the terms of Policy BE3 the Borough Council may prepare schemes for the enhancement of conservation areas. Strict control over the design of new development will be exercised in these areas. There are numerous listed buildings in and around Ewell village.
- 4.25 With regard to archaeological remains and archaeological potential, two levels of local plan designation are relevant to the Hogsmill River. Firstly, Scheduled Ancient Monuments which are protected by Policy BE24 and secondly Sites of Archaeological Potential. The former parish church in Ewell, close to the source of the Hogsmill is a Scheduled Ancient Monument and Sites of Archaeological Potential include the site of the gunpowder mills at Malden Lane, a number of Mesolithic sites in the Hogsmill valley, and further Mesolithic sites within and around Ewell village. These are shown on Figure 4.2.

Epsom Hospitals Cluster and Country Park

- 4.26 The whole of the Epsom Hospitals Cluster lies within the Green Belt. Some of the five hospitals are likely to be declared surplus to the requirements of the health authorities before the end of the century and this presents a considerable challenge in planning for their future use and redevelopment. To the west of the hospitals lies Horton Country Park, designated under the Countryside Act 1968.
- 4.27 In planning the future use of the Epsom hospitals, the Borough Council have worked closely with Surrey County Council and identified a series of principles which plans should follow. The original Local Plan proposals were based on a careful analysis of existing uses, the extent of developable lands, existing planning policy and ongoing health authority requirements. Overall the Local Plan proposed a mixture of new

residential development, conversion of existing buildings to residential use and new health-related uses. New roads and community facilities will also be required to serve this development. Large areas of land are proposed to be kept open or landscaped. One hospital may continue in health authority use. Following the Inspector's Report into the Local Plan, the Borough Council are amending their proposals for the Hospital Cluster and these are likely to be published as modifications.

- 4.28 Tributaries of the Hogsmill and Bonesgate abut the hospital cluster and lie within Horton Country Park. The Country Park is based on land originally acquired by the Borough Council from the health authorities. The Country Park contains a golf course and driving range, a Farm Centre and an equestrian centre. New woodland planting has been carried out and bridleways and footpaths are being upgraded. This is an important area of open recreational land. The Local Plan proposes to widen the country park at its narrowest points and the Council will seek to acquire land for this purpose.
- 4.29 There are no development sites, apart from the Hospitals Cluster identified in the Epsom Local Plan which are in close proximity to the Hogsmill or its tributaries.

PUBLIC ACCESS AND RECREATION

Public Open Space

- 4.30 From its source at the springs at Ewell downstream to the Surbiton to Waterloo railway line the Hogsmill river flows with an almost unbroken corridor of public open space. The Borough of Epsom and Ewell own and manage the open space up to the borough boundary at the confluence with the Bonesgate Stream. The Royal Borough of Kingston own and manage the remainder of the land adjacent to the river as an informal riverside park. The estates department of the Royal Borough are currently in the process of purchasing the remaining section, not in public ownership, between Riverhill and Old Malden. The lower reaches of the Bonesgate Stream forms the boundary between the two local authorities. Downstream from Castle Hill, the stream flows within a narrow ribbon of public open space between housing before opening out at Tolworth Court Farm. The farm has recently been purchased by the Royal Borough of Kingston for public open space. The land on either side of the Surbiton Stream is also largely owned by The Royal Borough of Kingston. The brook flows within King Charles Recreation Ground, Edith Garden Allotments and Raeburn Open Space.

- 4.31 The two tributaries with the Borough of Epsom and Ewell, Horton Stream and Green Lanes Stream, are similarly largely within public open space. The upper reaches of Horton Stream are within Horton Country Park. Public open space close to or adjoining the river is shown on Figure 4.3, together with other important recreational resources such as the Royal Park near the Thames and Epsom and Ashted Commons near the source of the Bonesgate Stream.

Hogsmill Walk

- 4.32 The Royal Borough of Kingston have developed a nearly continuous walkway along the Hogsmill River and the Bonesgate Stream from Kingston town centre in the north to the Green Belt in the south. Three sections are still to be implemented, from Kingston Cemetery to the Surbiton-Waterloo railway line, from Old Malden along the north bank of the river to Worcester Park Road and a section of the Bonesgate Stream. The route of the Hogsmill Walk is shown on Figure 4.3.
- 4.33 The section crossing the Thames Water land on the outskirts of Kingston is planned to be implemented when the former standby lagoons to the north of the river are developed for sports and recreation facilities, and an informal park incorporating a riverside walk. The section between Old Malden and Worcester Park is due to be implemented in 1994.
- 4.34 The walkway follows the watercourses except for the upper reaches of the Bonesgate Stream when it runs down Green Lane, an ancient drove road, to Chalky Lane. There is no direct link at present between Chalky Lane and the footpaths and bridleway that leads southward to Ashted Common. There are plans, however, to route the path along a former railway line between these two points.
- 4.35 The Hogsmill Walk is a popular and well used local recreational resource. The enjoyment of the public has been increased by the high quality interpretation boards recently installed and the leaflets available. The Kingston Group of the Surrey Wildlife Trust have also prepared a very informative leaflet titled 'A Hogsmill Safari' describing all the points of interest along the river from Kingston to the springs at Ewell. The Hogsmill Walk is also recognised by the London Walkers Forum and is shown on their strategic network of routes in and around London. The Royal Borough have made representations to the Countryside Commission proposing the Hogsmill Walk as part of a strategic footpath linking the Thames Path at Kingston to the North Downs Way at Box Hill.

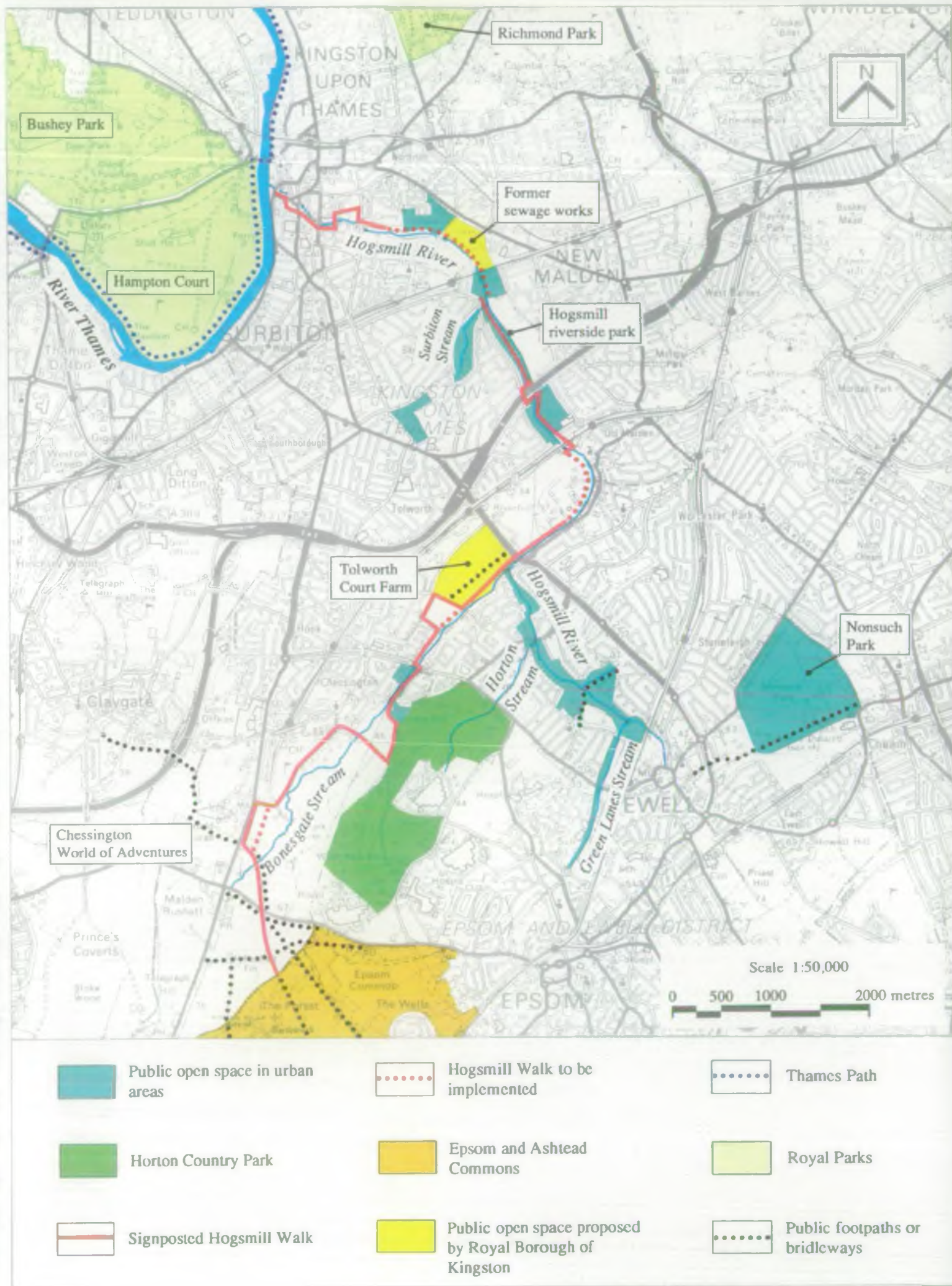


Figure 4.3 Public Access and Recreation

5. LANDSCAPE TYPES

MACRO RIVER LANDSCAPE TYPES

- 5.1 The 'Macro River Landscape' refers to the wider landscape of the river valley defined by the 'visual envelope' of the river or its tributaries. Within the visual envelope the following Macro River Landscape Types have been identified. These are shown on Figures 5.1 and 5.2 and illustrated in Figure 5.3.

Town centre

Percentage of river corridor: 5% Example: Kingston

Value Class: 3/4

Management Strategy: Restoration/Enhancement

- 5.2 The river is channelised through Kingston Town Centre, with buildings close up to the water's edge. This has resulted in a narrow visual envelope, with the river only visible to the general public at crossing points. Victorian terraced housing, buildings belonging to Kingston University and industrial works, on the site of a former mill, adjoin the river downstream from Villiers Road. Within the centre of Kingston the river flows between high vertical walls through The Guildhall complex.

Village centre

Percentage of river corridor: 3% Example: Ewell Village

Old Malden Village

Value Class: 2/3

Management Strategy: Conservation/Restoration

- 5.3 The centre of Ewell still retains the scale and character of a village, despite the loss of many attractive old buildings over the last 50 years. The series of ponds, fed by springs at the source of the river, and the former Upper and Lower Mill buildings are important townscape features.

- 5.4 The original village of Malden focuses on the 16th century church of St. John the Baptist and the adjoining Manor House which, together with outbuildings and cottages of Manor Farm, cluster on the top of a hill overlooking the Hogsmill Valley. The open space provides a fine setting for the buildings and a welcome break in the surrounding area of semi-detached houses. The historic centres of Old Malden Village and Ewell Village area both designated as Conservation Areas.

Suburban housing

Percentage of river corridor: 22.5% Example: Chessington, West Ewell,
Worcester Park, New Malden,
Berrylands

Value Class: 3

Management Strategy: Restoration

- 5.5 Large speculative built estates, developed between the Wars, extend up to the edge of the floodplain and define the visual envelope for the majority of the river corridor. The housing is relatively uniform, with evenly spaced roads and regular semi-detached housing. Most roads have grass verges with ornamental trees.

Industrial and commercial

Percentage of river corridor: 2% Example: Green Lanes Stream, Longmead
Trading Estate

Value Class: 3/4

Management Strategy: Restoration/Enhancement

- 5.6 For an urban catchment the river and its tributaries have relatively few industrial/commercial premises. The Green Lanes Stream has the Longmead Industrial Estate along its eastern bank and in the lower reaches of the Hogsmill River there is a trading estate and a council refuse station to the east of Villiers Road on the site of a former mill.

Sewage works

Percentage of river corridor: 3% Example: Hogsmill Sewage
Treatment Works

Value Class: 3/4

Management Strategy: Restoration/Enhancement

- 5.7 There is no public access to the large sewage treatment works, on the outskirts of Kingston, and views are limited to occasional glimpses from Lower Marsh Lane and Kingston Cemetery. The river flows within a deep cutting along the northern edge of the works and is generally not visible. The sewage works, still in operational use, are characterised by green banks, often speckled white with gulls, surrounding the complex of tanks and pipework. This contrasts with the extensive unmanaged areas to the west of the main works and to the north of the river. The disused sludge beds have been overtaken by vegetation and the flat polygonal floors of the lagoons now support a carpet of damp loving plants.

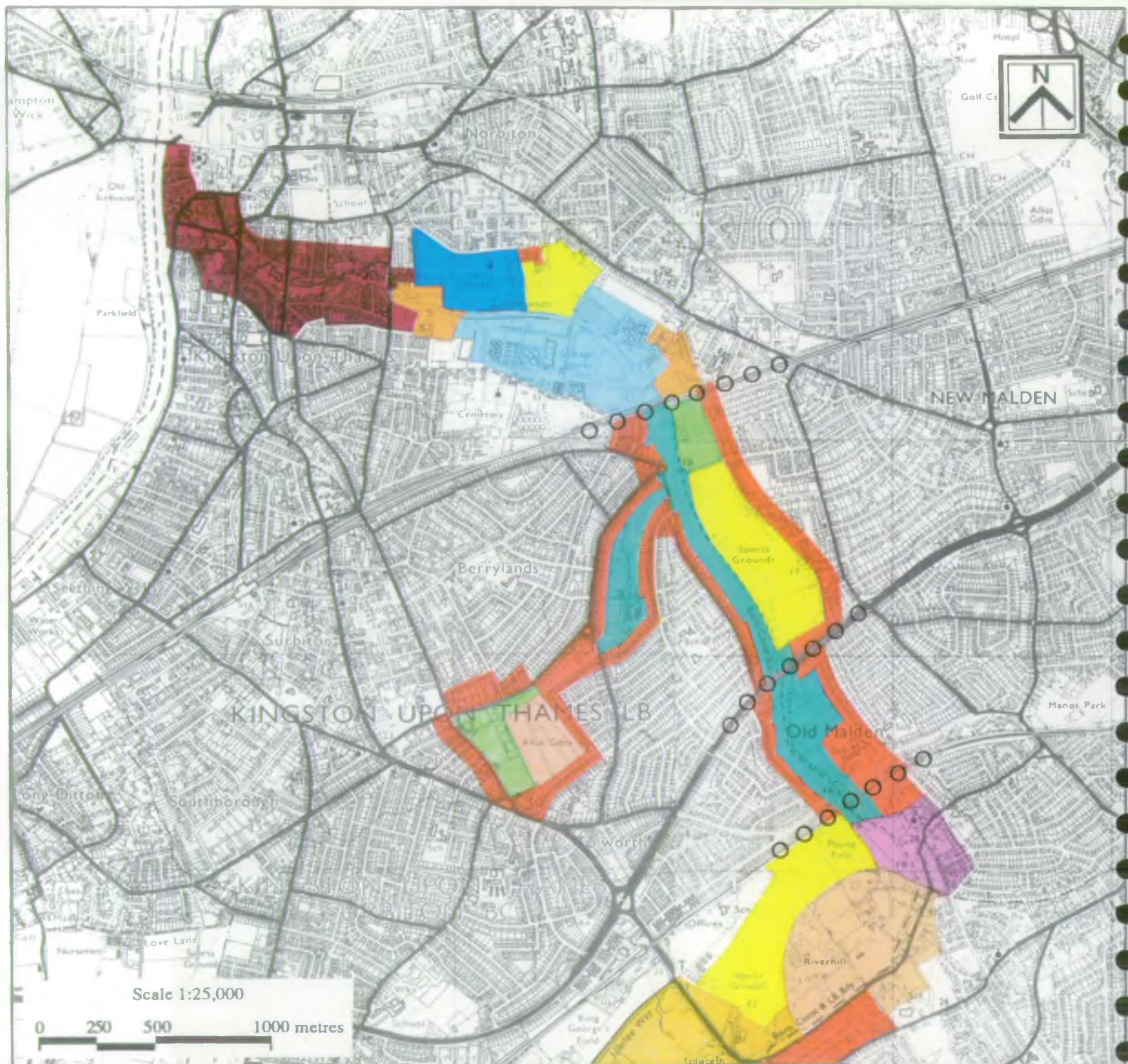


Figure 5.1 Macro River Landscapes Types (north)

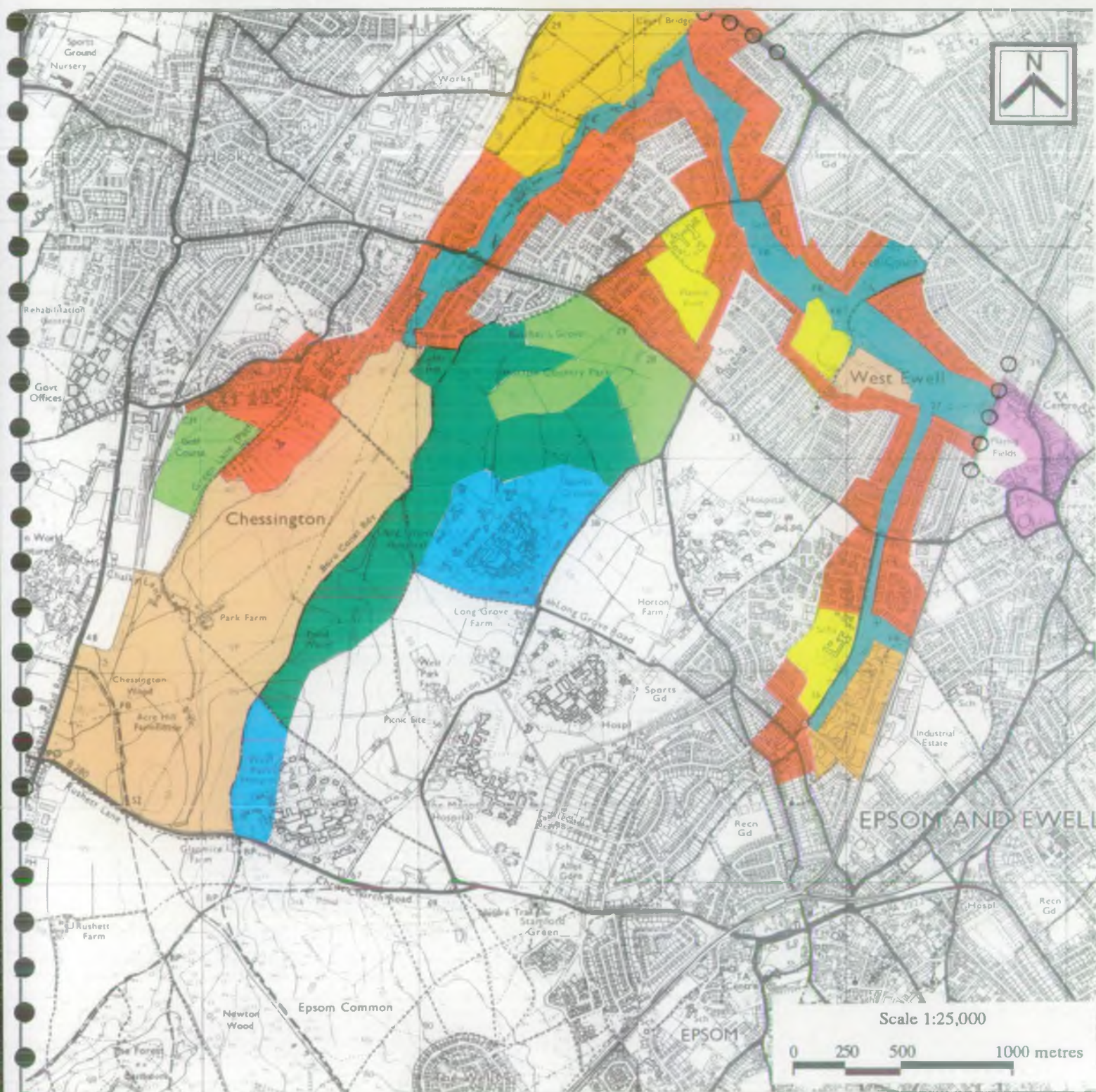


Figure 5.2 Macro River Landscapes Types (south)

Cemetery

Percentage of river corridor: 1% Example: Kingston Cemetery

Value Class: 3

Management Strategy: Restoration

- 5.8 This large cemetery lies between Kingston Town Centre and Norbiton, adjacent to an area of high density housing. The Hogsmill River runs along its southern side, where there is a narrow strip of woodland. The cemetery consists of serried ranks of gravestones set within formal grounds. The crematorium is at the end of a central avenue overlooking the river. The woodland has a very neglected feel to it, with litter and rubbish lying around, in contrast with the highly manicured appearance of the rest of the cemetery.

Hospital lands

Percentage of river corridor: 5% Example: Long Grove Hospital

Value Class: 2/3/4

Management Strategy: Conservation/Restoration/Enhancement

- 5.9 In the 1890s London County Council purchased the Horton Estate to the west of Epsom and began to construct a series of large hospitals for the mentally ill. The hospitals cluster is the largest of its type in Europe. The hospital sites each centre on an integrated building complex broadly grouped around a semi-circular corridor arrangement. Other buildings have been added, over a period of time, in the large grounds surrounding the original buildings. All three sites have tree cover, including many interesting and unusual species.

Road and rail corridors

Percentage of river corridor: 0.5% Example: A3 Kingston Bypass, Surbiton-Waterloo railway line

Value Class: 4

Management Strategy: Enhancement

- 5.10 The river is severed by a number of main transport routes which are dominant and visually intrusive elements in the landscape. The river passes under these routes, in either a culvert or tunnel.

Allotments

Percentage of river corridor: 1% Example: Tolworth Main Allotments

Value Class: 2/3

Management Strategy: Conservation/Restoration

- 5.11 A number of allotment sites lie adjacent to the river and its tributaries. The largest, Tolworth Main Allotments, are next to the Surbiton Stream. Over the last decade, many of these allotment sites have ceased to be actively managed and have become overgrown with brambles. Where still worked, the allotments are characterised by strips of colourful vegetable and fruit crops, protected by an assortment of bird scaring measures. The abandoned allotments are important sites of wildlife and two have been designated by the Royal Borough of Kingston as local nature reserves.

Small holdings

Percentage of river corridor: 3.5% Example: Riverhill Estate, Old Malden

Value Class: 3

Management Strategy: Restoration

- 5.12 The Riverhill Estate and the area of open land at Old Malden consists of a patchwork of small grazed fields, stables, private detached houses, abandoned nurseries, a mobile home park, and a depot on the site of a former water mill. The church and manor house at Old Malden overlook this area. The river corridor is well wooded and the channel has been straightened. The area is designated as Metropolitan Open Land which prevents it being built upon but, unfortunately, traditional farming practices are no longer economic on such a small scale and the landscape is becoming degraded.

Golf courses

Percentage of river corridor: 5% Example: Horton Country Club

Value Class: 2/3

Management Strategy: Conservation/Restoration

- 5.13 There are two golf courses within the visual envelope. Horton Stream flows through the centre of the nine hole golf course in Horton Country Club and a public course is on the valley sides above the Bonesgate Stream in Chessington. The Horton Stream has been dammed to form two ponds within the golf course and is close to a visually intrusive floodlit driving range.

Sports grounds and playing fields

Percentage of river corridor: 8% Example: Private Sports Grounds

Value Class: 3 - New Malden

Management Strategy: Restoration Kings Meadow Stadium
- Norbiton

- 5.14 Private and public sports grounds with large areas of closely mown grass are found on the flat river alluvium and terraces adjoining the river. The private sports grounds, on the eastern bank of the river in New Malden, dominate the river floodplain. Each sports ground or club has its own small pavilion and associated car parking. The Kings Meadow Stadium at Norbiton is more developed with an artificial running track and small stand for spectators.

Urban park

Percentage of river corridor: 1% Example: King Charles Recreation Ground

Value Class: 3/4

Management Strategy: Restoration/Enhancement

- 5.15 The river, or its tributaries, runs through or alongside a number of small traditional urban parks, characterised by closely mown grass, with play equipment and bowling greens. The water course is straightened or channelised and often fenced to prevent children falling in the water.

Informal riverside park

Percentage of river corridor: 9.5% Example: Hogsmill and Southwood open

Value Class: 2/3 spaces - Old Malden
Elmbridge Avenue and Rose Walk
Open Spaces - Berrylands

Management Strategy: Conservation/Restoration

- 5.16 A series of informal open spaces adjoin the river and its tributaries, forming a green chain along significant lengths of the watercourses within the catchment. These open spaces contain a range of habitats - woodland, hedgerow scrub, neutral grassland, mown amenity grass and patches of marshy alluvial meadows. The river generally flows within a widened and straightened channel, constrained by toe boarding. Where this has rotted away, a more natural and sinuous channel has re-established itself. The banks are often fringed in places with reeds and emergent vegetation. These informal open spaces are a valuable resource and are frequently used by children, joggers and people walking their dogs.

Unmanaged pasture and meadow

Percentage of river corridor: 6% Example: Tolworth Court Farm

Value Class: 2/3

Management Strategy: Conservation/Restoration

- 5.17 Planning policies have prevented this strategically important open space between Tolworth and Ewell being developed. The fields are criss-crossed by old hedgerows, containing mature oak trees. Until recently, the farm was managed as horse pasture and hay meadow, but unfortunately traditional farming practices are no longer economic on such a small scale. This is an important but fragile landscape type within an urban area and unless properly managed will rapidly become degraded.

Country park

Percentage of river corridor: 8% Example: Horton Country Park

Value Class: 2/3

Management Strategy: Conservation/Restoration

- 5.18 Horton Country Park was established in 1973, when 400 acres of land were purchased by Epsom & Ewell Borough Council from London County Council. It had previously been farmland, which supplied food and work for the patients of the surrounding psychiatric hospitals. The country park is a rural landscape of fields, hedgerows, woods, meadows and ponds of wildlife and historical value. Additional woodlands have been planted and a network of bridlepaths and footpaths developed. The Horton Stream flows through rough meadows which are managed for hay and passes close to Great Wood, an ancient woodland.

Mixed farmland with woodland

Percentage of river corridor: 16% Example: Park Farm, Chessington

Value Class: 2/3

Management Strategy: Conservation/Restoration

- 5.19 The upper reaches of the Bonesgate Stream have formed a shallow valley at the bottom of which the stream meanders within a narrow strip of woodland. Green Belt policies have prevented this farmland from being developed. The damper ground at the bottom of the valley is given over to permanent pasture. The valley slopes support root crops and beef cattle on improved grassland. There is evidence of hedgerow removal leaving individual trees. Small blocks and strips of woodland help sub-divide the farmland. Chessington Wood is the largest and most ecologically important woodland.



Kingston Town Centre looking downstream from Springfield Road Bridge.



Industrial and commercial estate looking upstream from Villiers Road Bridge.



Suburban housing in Chessington with the Bonesgate Stream in the foreground.



Abandoned sewage works. UDP Site No. 37.



Sports fields on the east bank of the river in New Malden.



Informal riverside park, Elmbridge Avenue open space.

Figure 5.3a Illustrations of Macro River Landscape Types



Small holdings - Riverhill Estate, Old Malden.



Unmanaged pasture - Tolworth Court Farm.



Golf course within Horton Country Park. The Horton Stream forms the boundary.



Hospital lands, Long Grove Hospital.



Horton Country Park.



Mixed farmland with woodland. The Bonesgate Stream flows along the edge of Chessington Wood.

Figure 5.3b Illustrations of Macro River Landscape Types

MICRO RIVER LANDSCAPE TYPES

- 5.20 The Micro River Landscape refers to the small scale landscape of the river itself created by the river channel and its immediate banks. The different landscape types have been classified according to the degree and type of modification of the channel and its bank caused by human activity. Within the Hogsmill catchment, the majority of the watercourse has been extensively altered over a long period of time.
- 5.21 The following descriptions summarise the different 'micro' landscape types. Figures 5.4 and 5.5 show the locations of the various types which are illustrated in Figure 5.6.

Wooded meandering - clay stream

Percentage of total watercourse: 15% Examples: Upper and middle reaches of
Channel Value: 1/2 the Bonesgate Stream
Management Strategy: Conservation/Restoration

- 5.22 The only sections of watercourse to have escaped human interference are the upper and middle reaches of the Bonesgate Stream. These exhibit a meandering plan form with a well defined sequence of pools and riffles, together with asymmetrical cross profiles. There is well defined lateral erosion of the steep clay banks, with undercutting on the outer banks of bends. The stream flows within a narrow corridor of woodland through mixed farmland. Heavy shading restricts the establishment of aquatic and marginal vegetation. Fallen trees and roots create obstructions and provide micro habitats.

Hedgerow ditch

Percentage of total watercourse: 7% Examples: Horton Stream,
Channel Value: 2/3 Horton Country Park
Management Strategy: Restoration

- 5.23 The upper reaches of the Bonesgate Stream and Horton Stream are narrow field ditches not more than 0.5 metres in width and often overgrown and tangled with vegetation. The watercourses have been straightened to follow field boundaries.

Straightened and resectioned suburban river

Percentage of total watercourse: 20% Examples: Elmbridge Avenue and
Channel Value: 2/3 Rose Walk Open Spaces,
Berrylands, Hogsmill Open
Management Strategy: Restoration/Enhancement Space, Ewell

- 5.24 Flood defence and land drainage schemes have modified large sections of the watercourse within the catchment. The resulting channels are generally over-wide, a uniform 4-6 metres in width, and constrained by toe boarding. Many of these sections of watercourse have been left largely unattended since modification and the natural processes of recovery are under way. This has involved the re-establishment of low flow widths within over-widened channels, particularly where the toe boarding has rotted or been buried by bank slumping. Emergent plants form a more or less continuous marginal growth where the banks are shallower.

Wooded and straightened suburban river

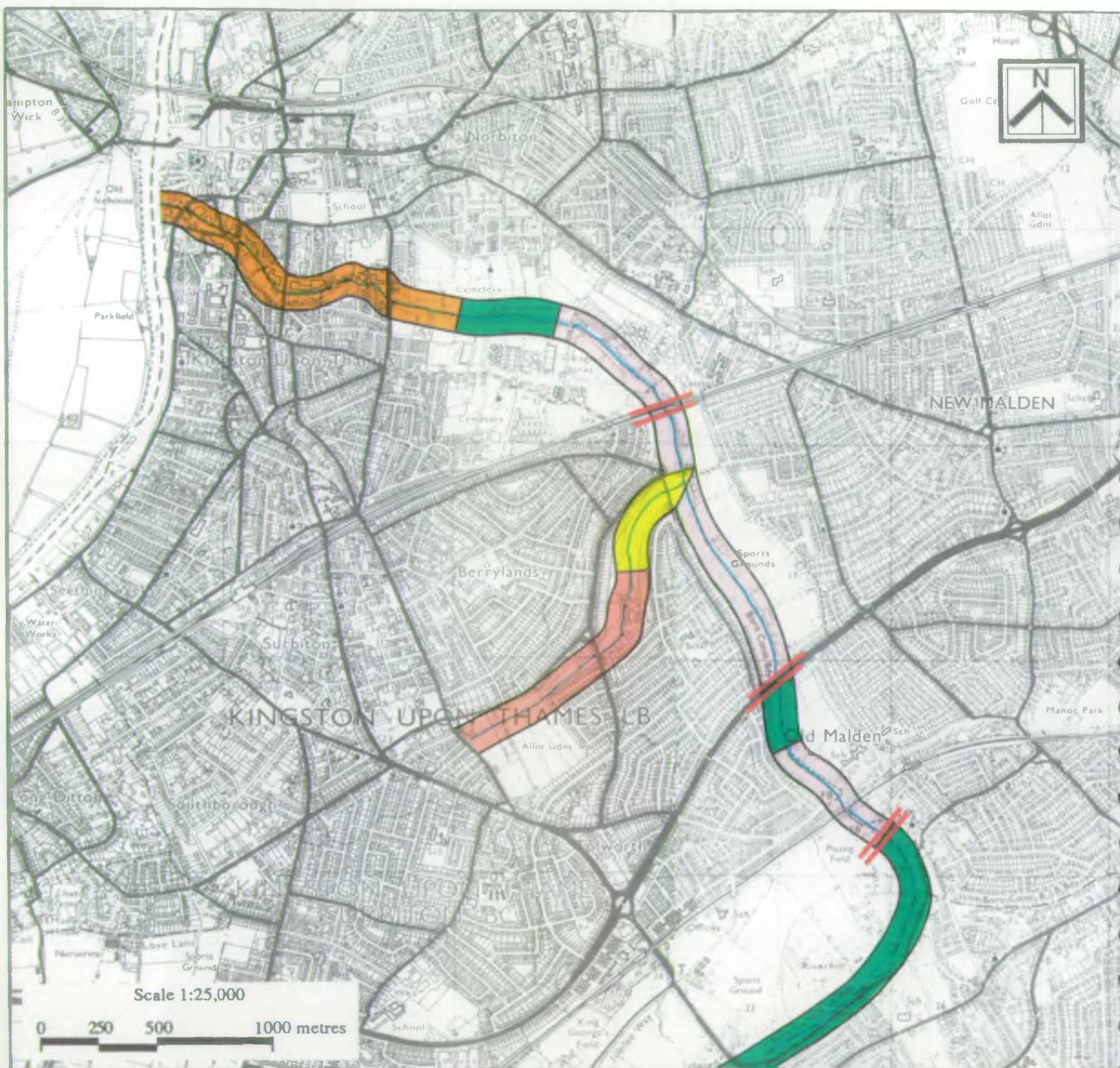
Percentage of total watercourse: 15% Examples: Hogsmill alongside the
Channel Value: 2/3 Worcester Park Road and at
Management Strategy: Restoration Riverhill and Old Malden

- 5.25 The river channel exhibits the same characteristics as the previous landscape type, except that it is enclosed within woodland. The often dense woodland has regenerated on either side of the water course, shading out aquatic or marginal vegetation.

Straightened and resectioned suburban stream

Percentage of total watercourse: 18.5% Examples: Bonesgate Stream
Channel Value: 3/4 Tolworth Court Farm
Management Strategy: Restoration/Enhancement Green Lanes Stream

- 5.26 The lower reaches of the tributaries flowing into the river have all been extensively modified, resulting in a narrow flow of water, 1-2 metres in width, within an over-wide and over-deepened channel constrained by toe boarding.



Channelised urban river



Straightened and resectioned suburban river



Straightened and resectioned suburban stream



Channelised suburban stream

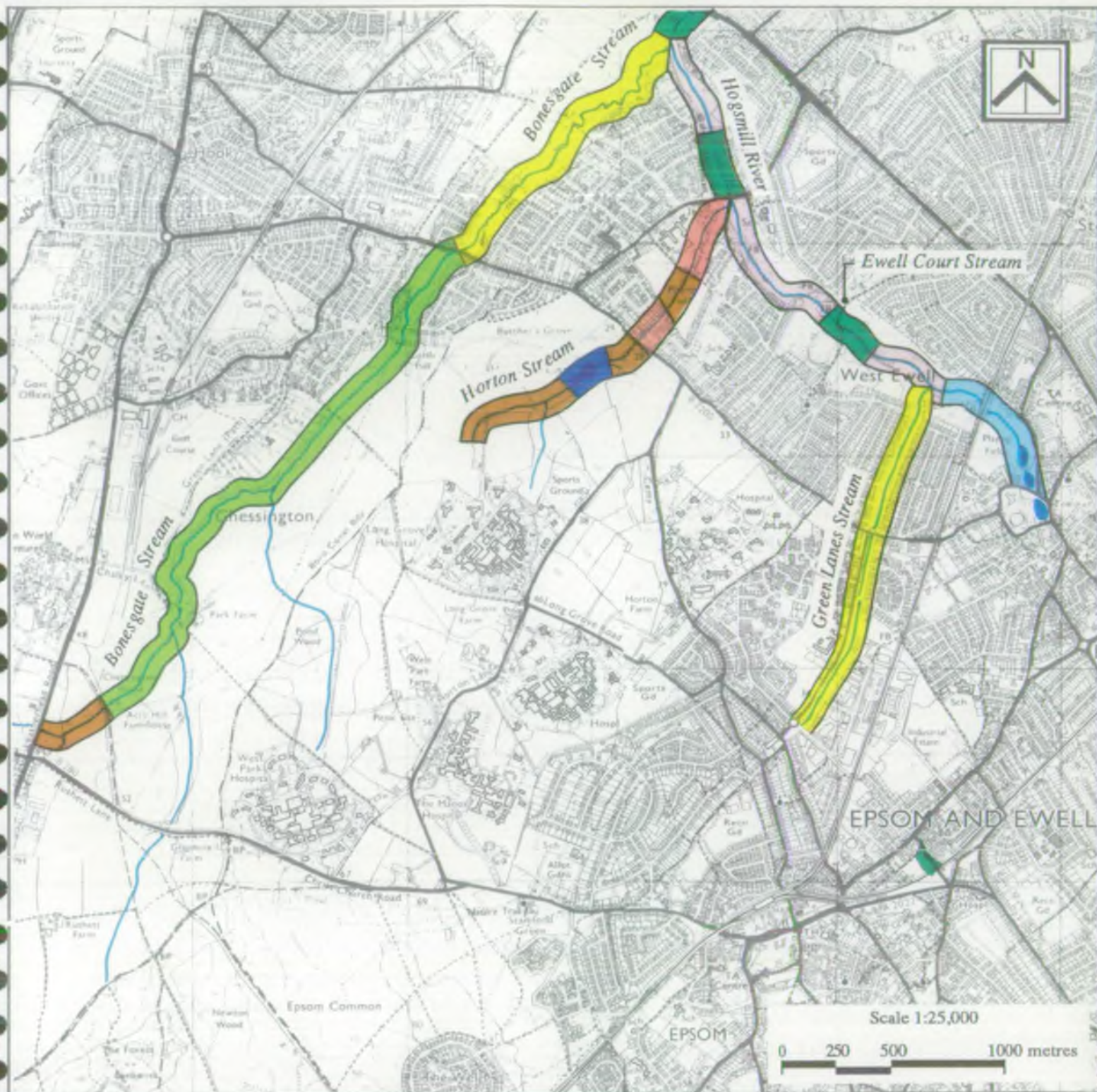



Wooded and straightened suburban river




Culvert

Figure 5.4 Micro River Landscape Types (north)



 Wooded meandering clay stream

 Wooded and straightened suburban river

 Channelised suburban stream

 Hedgerow ditch

 Straightened and resectioned suburban river

 Former mill ponds

 Straightened and resectioned suburban stream


 Ponds

Figure 5.5 Micro River Landscape Types (south)

Former mill ponds

Percentage of total watercourse: 3% Examples: Upper and Lower Mills, Ewell
Channel Value: 2/3
Management Strategy: Restoration

- 5.27 The river was used to drive a number of mills between Ewell and Kingston (see paragraphs 2.17 to 2.21). Mill ponds only survive in Ewell Village, where they are important townscape features. Low flows within recent years have caused them to become choked with vegetation.

Ponds

Percentage of total watercourse: 1% Examples: Horton Stream,
Channel Value: 2 Horton Country Park
Management Strategy: Conservation

- 5.28 The Horton Stream has been dammed to form two large ponds within the golf course of Horton Country Park. The upstream pond is natural in character with stands of bulrushes, while the downstream pond is more ornamental with mown banks.

Channelised urban river

Percentage of total watercourse: 10% Examples: Kingston Town Centre
Channel Value: 4
Management Strategy: Enhancement

- 5.29 The final 1.5km of the main channel, downstream from Villiers Road, in Kingston town centre is completely channelised. The river is flanked almost entirely by buildings to the confluence with the River Thames. The channel is uniform in width (6-8 metres) and typically flows within concrete vertical walls, with a natural substrate bed. Sections of the Hogsmill with a concrete bed and banks are confined, with short exceptions, to a length of the river below Hogsmill STW and the last 100 metres of channel to the Thames.

Channelised suburban stream

Percentage of total watercourse: 9%

Examples: Surbiton Stream

Channel Value: 4

Management Strategy: Enhancement

- 5.30 The Surbiton Stream is the only tributary (the Ewell Court Stream is outside the scope of this study) with significant lengths of channelised watercourse. The Stream is contained within a concrete walled channel (1-2 metres in width) where it runs through public open space. Fencing visually exaggerates the depth of channel. The uniform bottom and walls create a visually and ecologically sterile environment.

Culvert

Percentage of total watercourse: 1.5%

Examples: A3(T) Kingston Bypass

Channel Value: 4

Surbiton-Waterloo

railway line

Management Strategy: Enhancement (where future development takes place)

- 5.31 The watercourse is severed in a number of locations by major transport routes. This has required the channel to be placed in a culvert or tunnel. The upper reaches of the Horton Stream is the only length of watercourse within culvert but not built over.



Channelised urban river, St. James Road, Kingston.



Channelised urban river, near Athelston Road refuse transfer station, Kingston.



Straightened and resectioned suburban river, near the Hogsmill Sewage Treatment Works.



Straightened and resectioned suburban river, Elmbridge Avenue open space.



Former mill ponds overgrown with watercress, Ewell.



Former mill ponds, near Lower Mill,, Ewell Village.

Figure 5.6a Illustrations of Micro River Landscape Types



Channelised suburban stream, Surbiton Stream at the former Surbiton Lagoon Site.



The Horton Stream dammed to form ponds within Horton Country Park.



Straightened and resectioned suburban stream. The Green Lanes Stream, Ewell.



Straightened and resectioned suburban stream. The lower reaches of the Bonesgate Stream.



Hedgerow ditch. The Horton Stream within the country park.



Wooded meandering clay stream. The Bonesgate Stream at Castle Hill.

Figure 5.6b Illustrations of Micro River Landscape Types

QUANTITATIVE ASSESSMENT

MACRO RIVER LANDSCAPE TYPES

% of river corridor
within visual envelope

1.	Town centre	5
2.	Village centre	3
3.	Suburban housing	22.5
4.	Industrial and commercial	2
5.	Sewage works	3
6.	Cemetery	1
7.	Hospital lands	5
8.	Road and rail corridors	0.5
9.	Allotments	1
10.	Small holdings	3.5
11.	Golf course	5
12.	Sports grounds and playing fields	8
13.	Urban park	1
14.	Informal riverside park	9.5
15.	Unmanaged pasture and meadow	6
16.	Country park	8
17.	Mixed farmland with woodland	16

MICRO RIVER LANDSCAPE TYPES

% of total watercourse

1.	Wooded meandering clay stream	15
2.	Hedgerow ditch	7
3.	Straightened and resectioned suburban river	20
4.	Wooded and straightened suburban river	15
5.	Straightened and resectioned suburban stream	18.5
6.	Former mill ponds	3
7.	Ponds	1
8.	Channelised urban river	10
9.	Channelised suburban stream	9
10.	Culvert	1.5

6. MANAGEMENT STRATEGY GUIDELINES

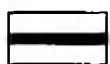
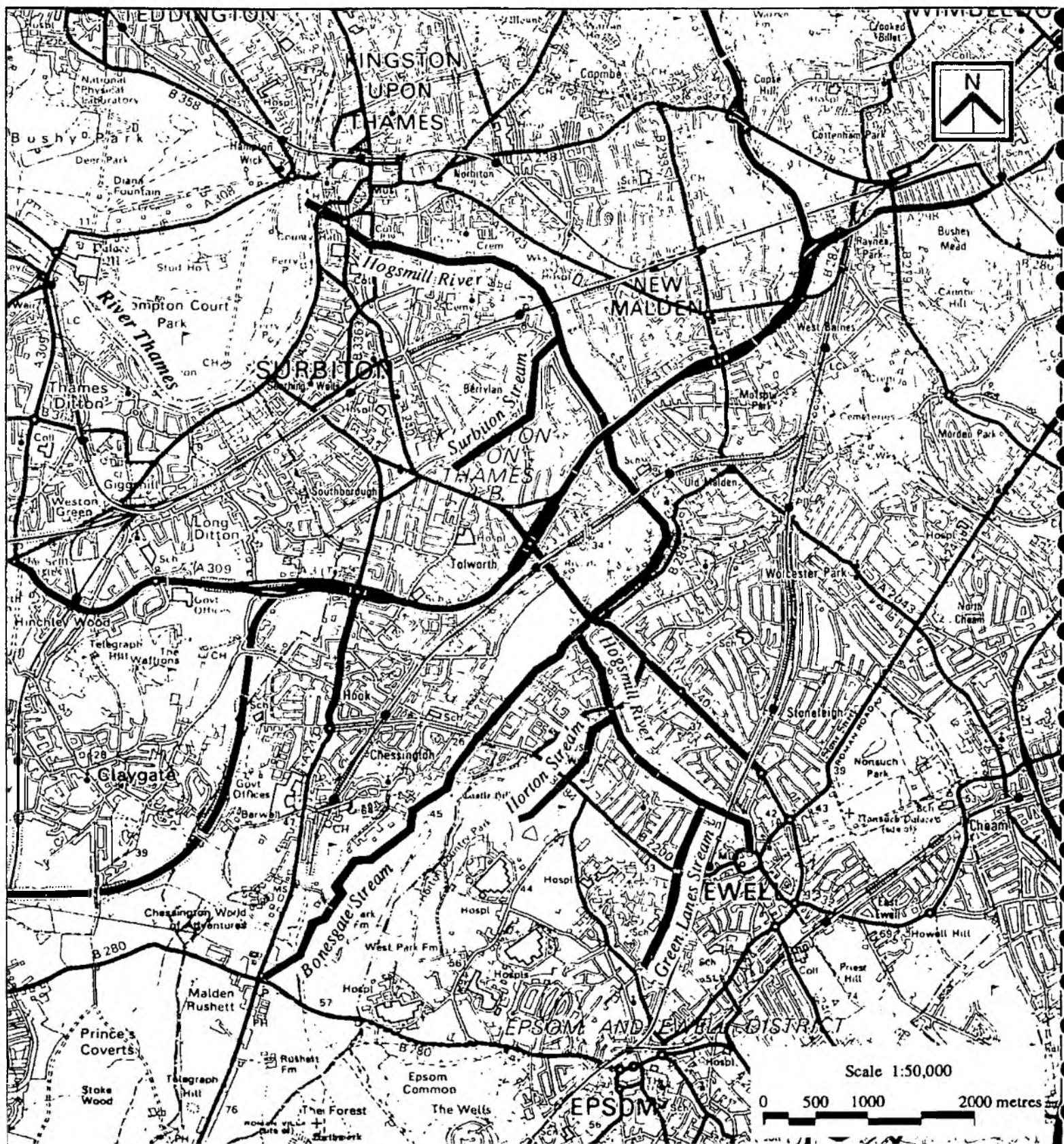
- 6.1 Landscape guidelines are the main mechanism to achieve action on the ground, whether this be through conservation, restoration or enhancement schemes. Guidelines defining the preferred strategy for each landscape type are outlined below. Definition of the strategy for different sections of watercourse will assist in the identification of priority areas for action, and help indicate where resources should be targeted to achieve optimum results. The three main strategy options defined by the NRA Methodology are:

Conservation	Emphasis on conservation of existing character and on appropriate management of particular features which contribute to this character.
Restoration	Emphasis on restoring landscape character where this is being degraded.
Enhancement	Emphasis on the enhancement of landscapes which have completely lost their former character and are downgraded, derelict or otherwise damaged. There may be opportunities to create new types of landscape as a result of enhancement.

- 6.2 The approximate relationship between the value classes set out in the NRA methodology and the management strategy options are:

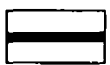
Value Class	Management Strategy
1, 2	CONSERVATION
2, 3	RESTORATION
3, 4	ENHANCEMENT

Figures 6.1 and 6.2 show the value classes and broad management strategies recommended for Micro landscapes of the watercourses within the Hogsmill Catchment.



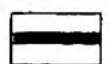
Value Class 1

Very strong, positive character with many valued features which are of great importance and essential to conserve.



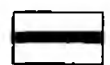
Value Class 2

Strong, positive character though perhaps some evidence of degradation. Should generally be conserved, but may need restoration or management.



Value Class 3

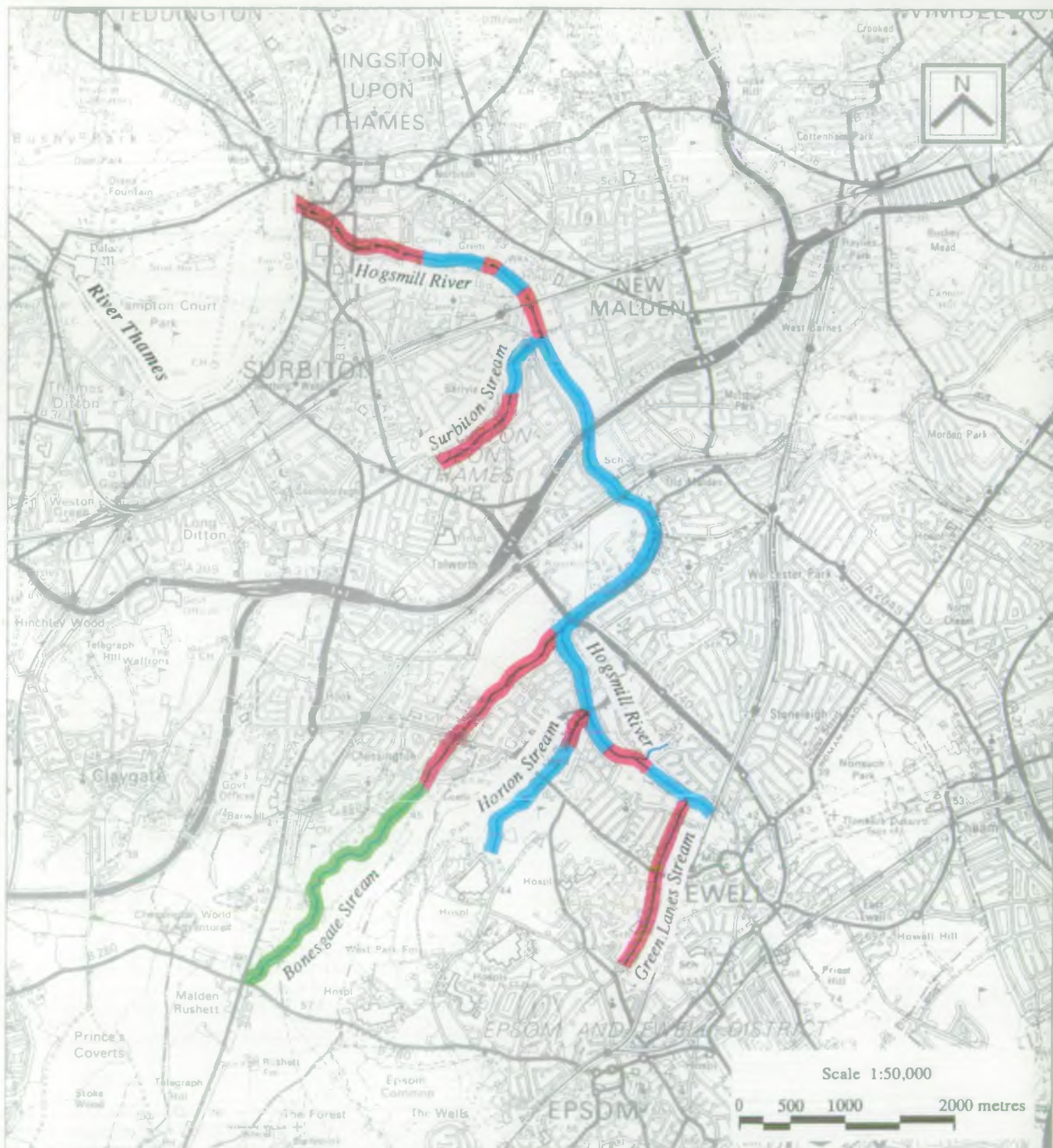
Some positive character but evidence that this has been generally eroded. These landscapes will benefit from restoration of landscape character but may also have some capacity to accept change.



Value Class 4

Largely negative in character with few strong positive features, offering significant scope for enhancement and potentially able to accommodate change.

Figure 6.1 Micro Landscape Value Classes



Conservation

Emphasis on conservation of existing character and on appropriate management of particular features which contribute to this character.



Restoration

Emphasis on restoring landscape character where this is being degraded.



Enhancement

Emphasis on the enhancement of landscapes which have completely lost their former character and are downgraded, derelict or damaged. There may be opportunities to create new types of landscape as a result of enhancement.

Figure 6.2 Management Strategy

CONSERVATION

- 6.3 A conservation strategy is appropriate where the river or its tributaries have been largely unmodified by man and have a positive landscape character. Within the Hogsmill Catchment only the upper and middle reaches of the Bonesgate Stream retain their semi-natural meandering course. All of the Hogsmill River and the remainder of its tributaries have been widened and straightened by flood alleviation and land drainage schemes.
- 6.4 The Bonesgate Stream flows within a narrow corridor of dense woodland for 3 kilometres from Chessington. There is little or no bankside or aquatic vegetation because of the heavy shading. The stream has steep clay banks, with evidence of lateral erosion and a well defined sequence of pools and riffles with gravel shoals and berms.
- 6.5 The upper reach of the stream as far north as Filby Road crosses mixed farmland and is within the Green Belt, the remainder is within public open space, which is designated Metropolitan Open Land. These sections of the stream are also of ecological and archaeological interest and the stream is designated a Site of Nature Conservation Importance. The stream passes close to Castle Hill, the remains of a medieval hunting lodge and a scheduled ancient monument.
- 6.6 Management strategy guidelines should focus on protecting and promoting the diversity of habitats and landscape features within the river corridor. These are likely to involve the following management techniques:
- leaving the channel untouched as far as possible, to conserve its structural diversity and variety of habitats
 - conserving vertical banks for kingfishers or sand martins
 - selected coppicing of riverside trees and scrub near the stream to increase light and the development of a more diverse marginal and aquatic flora
 - management of neglected woodlands
 - the provision of a buffer strip, untreated with herbicide or fertiliser, adjacent to the wooded stream where it crosses arable farmland. This could be part of the government set-aside scheme

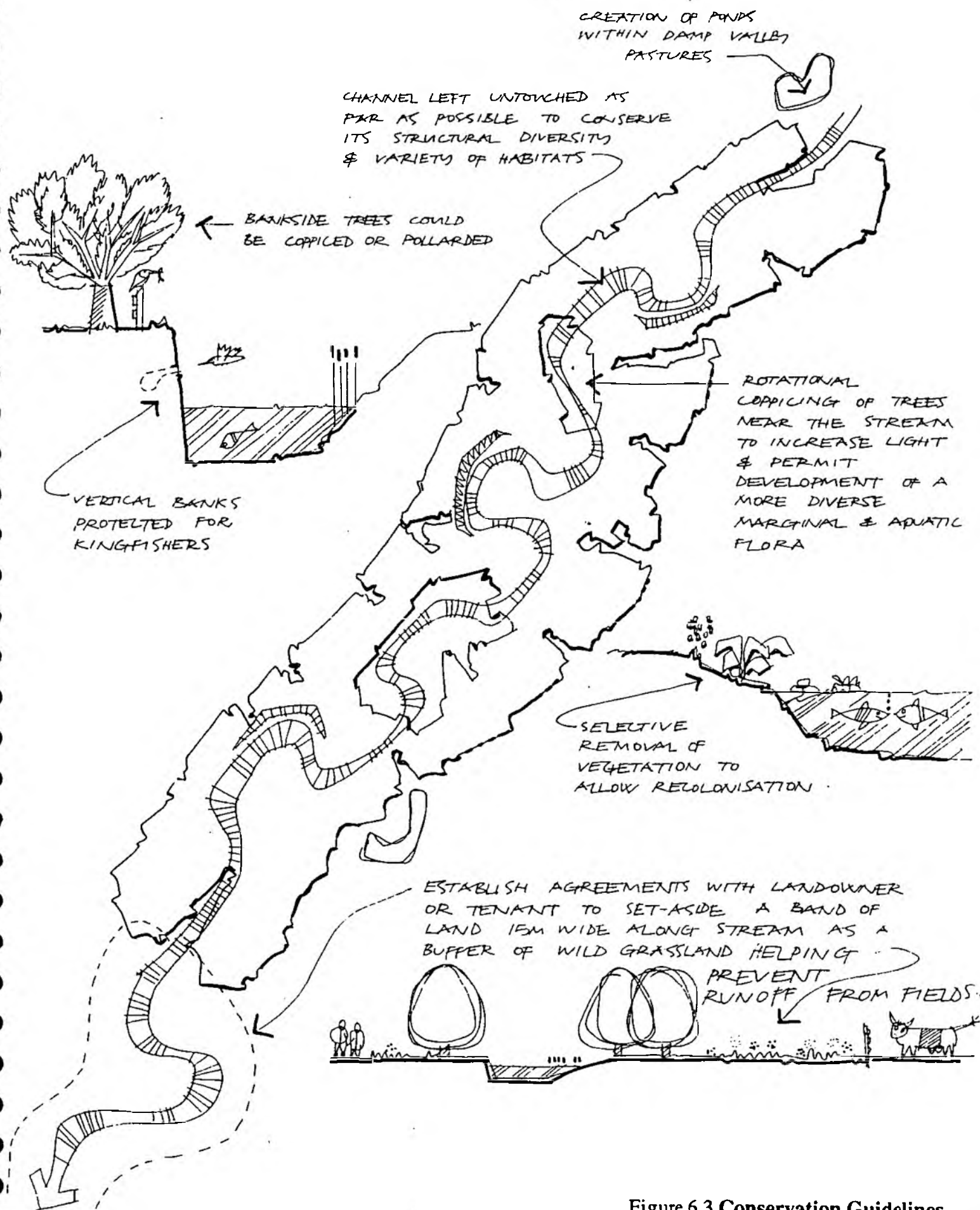


Figure 6.3 Conservation Guidelines

RESTORATION

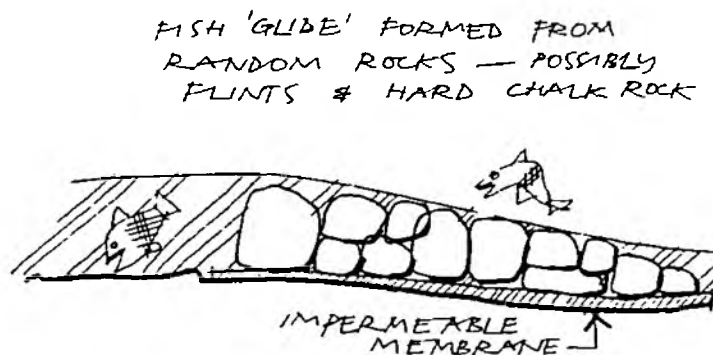
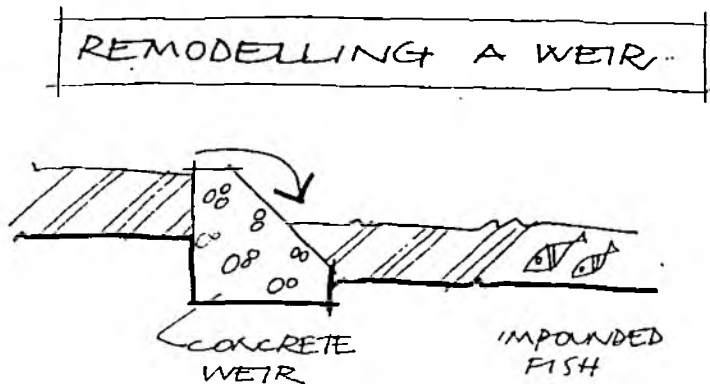
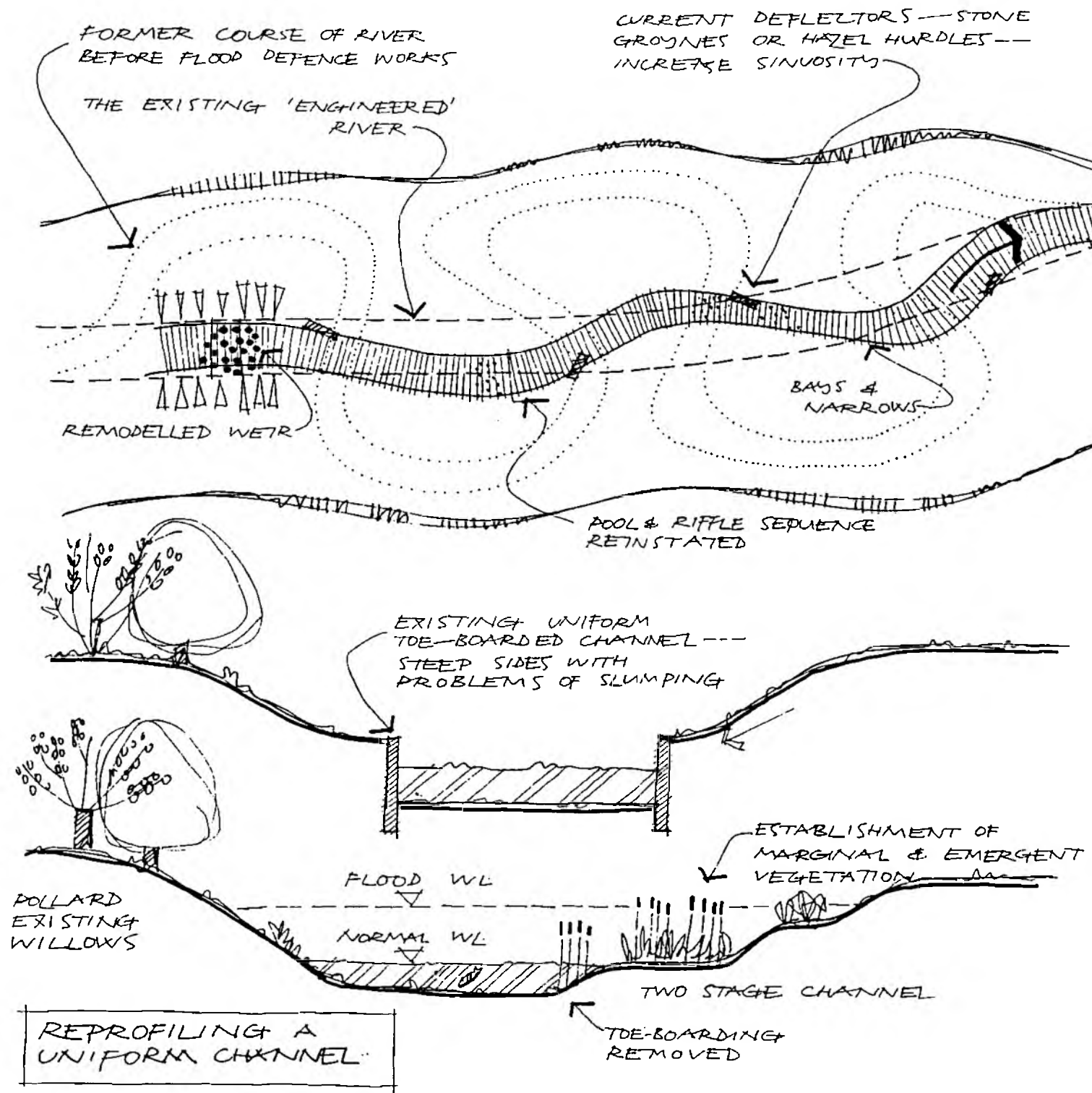
- 6.7 A large percentage of the Hogsmill River and its tributaries were widened and straightened during the 1950s and 1960s in a series of flood defence and land drainage schemes implemented by Surrey County Council. The previously natural meandering course of the river has been largely replaced by a uniform, over-wide channel constrained by toe-boarding. After 30 years many sections of toe-boarding have now rotted and the channel banks have begun to slump which has locally restored in-channel features and re-established more natural cross-sectional forms.
- 6.8 The majority of these reaches are bordered by an informal riverside park which forms a long ribbon of open land, penetrating into the urban area. The park is a mosaic of different habitats including woodland, neutral grassland, alluvial flood meadow and riverine communities. The Hogsmill Walk follows the river within the Royal Borough of Kingston, the floodplain is designated Metropolitan Open Land. The river corridor is also important for informal recreation within Epsom and Ewell where it is designated as Open Spaces in Urban Areas. Long lengths of the river are also Sites of Nature Conservation Importance and Areas of Archaeological Importance.
- 6.9 Management strategy guidelines should focus on repairing the riparian landscape and encouraging the natural process of recovery.

Channel

- the removal of unnecessary toe boarding to enable the channel to re-establish a natural equilibrium and recover natural bank features
- the installation of current deflectors, and gravel traps to narrow the channel, improve sinuosity and reinstate natural low flow widths within the confines of the existing over-widened channel
- the reinstatement of pools and riffles by importing gravels and boulders and the installation of random rock weirs
- the creation of shallow-water berms to maintain a self-scouring low flow channel, increase channel habitat variety and re-establish marginal beds of emergent vegetation.
- the establishment of aquatic plants

Banks

- reprofiling of banks to improve habitat diversity including vertical earth banks for kingfishers, sand martins and water voles
- the creation of shallow bays and widened pools, sheltered from the main water flow
- the dredging of abandoned ox-bow lakes and creation of wetland habitats
- the reinstatement of lost landscape features such as hedgerows, riverside trees and woodlands
- coppicing/pollarding of riverside trees and management of neglected woodland
- the control of invasive non-native species such as Himalayan Balsam and Japanese knotweed
- improved public access, way-marking and interpretation.



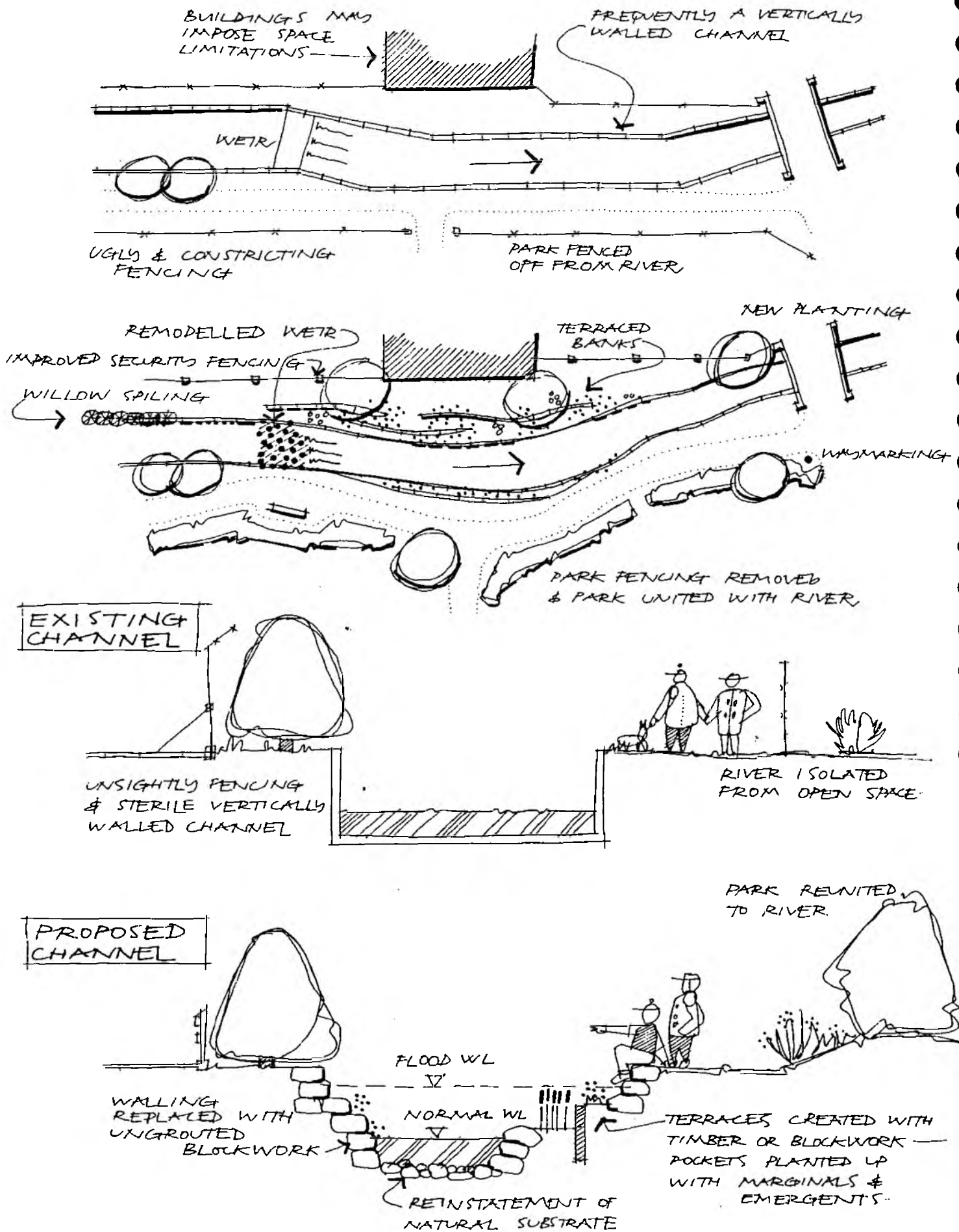
ENHANCEMENT

6.10 Downstream from the Hogsmill Sewage Treatment Works the river is largely channelised as it passes through Kingston Town Centre before entering the Thames. Elsewhere along the river short sections have been placed in channel or culvert where the river has been severed by roads and railway lines. The Surbiton Stream within the King Charles Recreation Ground and the adjacent allotments is also placed within a vertical walled channel.

6.11 Management strategy guidelines would ideally aim at a return to a more natural channel form. However it is not possible to achieve a natural profile in most cases due to the hydrological constraints imposed by space limitation in urban areas. For these reasons the removal of artificial channels or the breaking out of culverts are unlikely to be feasible unless areas are subject to redevelopment or within public open space. For this reason enhancement opportunities are limited to sections of the Surbiton Stream, Green Lane Stream and Bonesgates Stream.

6.12 Opportunities could include:

- where space and hydrological constraints allow, the removal of unnecessary bank protection and reprofiling to form a natural edged channel
- the reinstatement of meanders and a sinuous plan form
- the removal/modification of flow regulating structures such as weirs to prevent fish impoundment and increase potential diversity of aquatic habitats
- the replacement of walled channels and heavy toe-boarding with more environmentally sensitive bank protection features such as willow spilling
- the reinstatement of natural riverbed substrates
- the installation of fish shelters and pools
- the removal of unsightly protective fencing
- new tree and shrub planting
- improved public access, waymarking and interpretation.



PLANNING POLICY GUIDANCE

- 6.13 The importance of the river as a landscape, recreation and nature conservation resource is reflected in both the strategic and local planning policies which apply to the Royal Borough of Kingston Upon Thames. Kingston Borough has also commissioned Management Briefs from the London Ecology Unit for the most important sections of river in the borough and has asked the Lower Mole Countryside Management Project to prepare management proposals for Tolworth Court Farm. This report also addresses the need for management of Tolworth Court Farm and highlights its value and considerable potential as an informal recreation, nature conservation and landscape resource.
- 6.14 Within the Borough of Epsom and Ewell, the Hogsmill River is not subject to such a specific planning policy approach. This is due to a range of both physical and administrative factors. Within Kingston town centre, the Hogsmill River is an important townscape feature and is more susceptible to development pressures on adjacent sites. In addition less of the land adjacent to the river is in public ownership (see Figure 2.7) and therefore greater development pressures may arise and hence a specific planning policy approach is required. Within the borough of Epsom and Ewell, a greater proportion of the Hogsmill and its tributaries is located adjacent to land owned by the Borough Council. Furthermore, tributaries such as Horton Stream lie within land designated as Green Belt and Horton Country Park. This area is already subject to a restrictive planning as expressed in general borough-wide planning policies.
- 6.15 With regard to river catchments generally, it is important that a comprehensive and consistent planning policy approach is adopted. The broad objective must be to conserve and enhance the total river environment. Such an approach is contained in the NRA's Guidance Notes for local planning authorities. Epsom Borough Council intend to prepare a Management Plan for the river during the 1994/5 financial year, information leaflets are being prepared and draft borough-wide nature conservation and green spaces strategies have been adopted. Epsom Borough Council are constrained however by a lack of resources to undertake significant work along the river or its tributaries.
- 6.16 The importance of a comprehensive planning policy framework cannot be over-emphasised. Such a framework should embrace all of the Hogsmill River and its tributaries whether in rural areas or town centres and regardless of issues such as adjacent land ownership and public access. Such a policy framework could include positive aims for conservation and enhancement. In the absence of specific policies,

new development schemes, such as the redevelopment of the Epsom Hospitals Cluster, may cause increases in the rate and volume of surface water run-off. This can result in the increased risk of flooding downstream and possible physical damage to the river environment. A comprehensive planning policy framework for the Hogsmill River within Epsom could be included in any formal Local Plan review.

- 6.17 From both a long term planning point of view and from a day-to-day management point of view, it would be beneficial for the two boroughs to work closely together in order to maximise the potential of the river and its tributaries, and to adopt common aims for conservation and enhancement. Such joint working would predominantly be at officer level, although the potential for Member-level collaboration may also be worth exploring. The experience and resources of the Lower Mole Countryside Management Project could also be utilised along the main river. Until now such efforts have concentrated on the upper reaches of the Bonesgate Stream, near Chessington.

7. DETAILED ASSESSMENT

The detailed assessment considers in greater detail the riparian landscape of the Hogsmill River and its tributaries. The study area has been divided into 13 different reaches. These have been determined according to the macro and micro landscape types. Notes have been prepared for each section of watercourse describing the river corridor, its nature conservation value, historical/cultural associations, planning status, public access and recreation. Where available, details are also given of the ownership of the river channel and adjoining land. Appropriate management recommendations are made in the form of target notes referenced to a 1:5000 scale map. Approximate capital costs of the work required to implement these proposals are given, together with a list of interested parties that should be consulted.

The location of the detailed assessment sheets are shown on Figure 7.1.

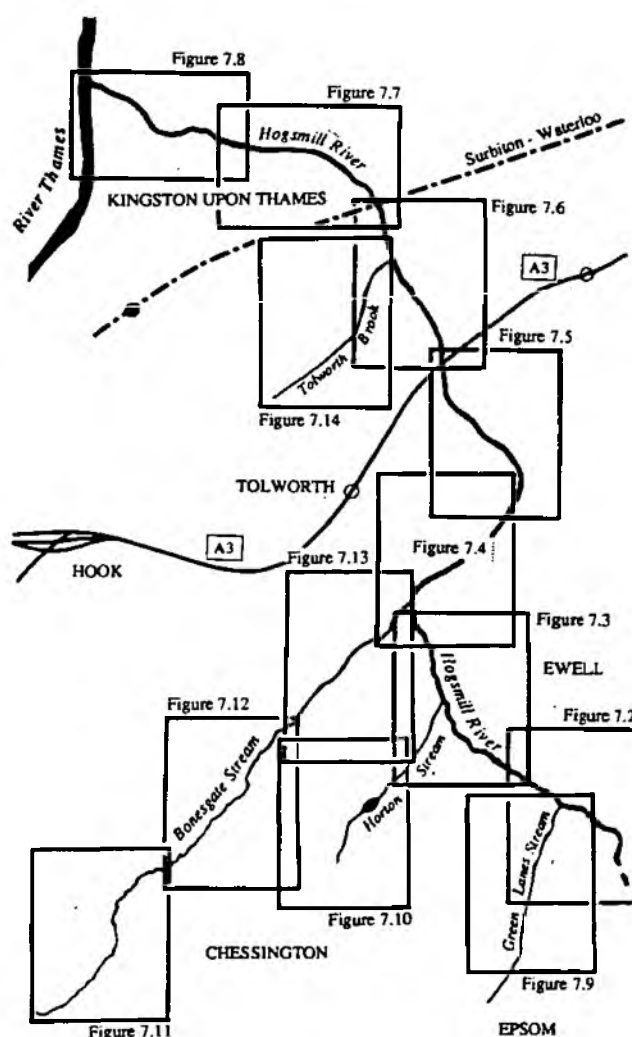


Figure 7.1 Location of Detailed Assessment Sheets

SOURCE OF THE HOGSMILL AND EWELL COURT

See Figure 7.2

LANDSCAPE CONTEXT

Description of River Corridor: The river rises as springs within the grounds of Bourne Hall in Ewell. The springs help feed five ponds which are linked by underground drains. There has been relatively little rainfall within the past few years which has reduced the amount of water which the ponds receive. Upper Mill Pond is within the study area and is fed by the Horse Pond and the main pond in Bourne Hall. The refurbished Upper Mill buildings straddles the pond, which runs parallel to the Kingston Road. All that survives of Lower Mill is the Miller's House, now offices. The former mill streams and channels to the south of Lower Mill are now overgrown.

The river passes through the railway line in a tunnel before opening out into the Hogsmill Open Space. The upper reaches of the river are impounded by the concrete bed and channel at the confluence with the Green Lanes Stream. Watercress completely covers the channel because of the low flow. The river is lined with mature willow trees downstream from the confluence at Chamber Mead. The river was extensively straightened in the 1950s and localised flood walls remain. Concrete stepping stones link the two banks. The river is channelised upstream of Ewell Court. Gunpowder works were once extensive in this area. The remains have become obscured by woodland and scrub.

Nature Conservation Value: The riverside park contains a range of habitats including woodland, scrub, neutral grassland and patches of marshy alluvial meadow. The section of river downstream from the Green Lanes Stream to the Bonesgate Stream was classified as 'Good' in the NRA Biological Survey, with the most diverse invertebrate assemblages in the catchment.

Historical/Cultural Associations: The area around Ewell Court formed the background to the painting of "Ophelia" by Sir John Millais and surrounding fields were depicted in "The Hireling Shepherd" by Holman Hunt.

Planning Status: Ewell Village is designated a Conservation Area and a number of listed buildings, including Lower Mill, are close to the mill ponds. The former gunpowder works near Ewell Court are designated a Site of Archaeological Potential and the riverside park is an 'Open Space in an Urban Area'.

Public Access and Recreation: The riverside walk in Ewell Village and the Hogsmill Open Space are well used and criss-crossed by paths.

Ownership: The public open space is owned and managed by the Borough of Epsom and Ewell. The river bed and banks are owned by the NRA.

MANAGEMENT STRATEGY	Cost
A. Selective removal of watercress and aquatic vegetation choking the former mill ponds in Ewell Village and channel downstream from the railway bridge.	1,000
B. Investigate feasibility of removing flow regulating structures at confluence with Green Lanes Stream to create a wetland area.	40,000
C. Remove remaining flood walls and regrade slopes to create gentler banks which will encourage emergent vegetation. Install current deflectors and sediment traps to improve sinuosity and create a sequence of pools and riffles.	20,000
D. Restore old mill channels and provide sign boarding and interpretative facilities to explain the archaeological and ecological features of interest.	5,000
E. Encourage the planting of native trees and shrubs near the Ewell Court Stream.	1,000
F. Investigate feasibility of removing flow regulating flume.	30,000
G. Liaise with Epsom and Ewell B.C. and Sutton Water Company about new borehole, to augment flows to the Bourne Hall Ponds.	N/A
Total	<u>£ 97,000</u>

LIAISON REQUIRED

Borough of Epsom and Ewell, Lower Mole Countryside Management Project, English Nature.



Figure 7.2 Detailed Assessment - Source of the Hogsmill, Ewell

THE HOGSMILL OPEN SPACE, EWELL

See Figure 7.3

LANDSCAPE CONTEXT

Description of Watercourse: This section of the river extends from Ewell Court to the confluence of the Bonesgate Stream. Downstream from the former gunpowder works, the river is channelised until it passes the confluence with the Ewell Court Stream. This area of open space is well used. There is a children's play area next to the river and two footpaths cross the valley, linking the residential areas of either side. The riverside park includes areas of rough meadow grass and groups of recently planted trees.

The river passes under Ruxley Lane and then flows within a narrow corridor between housing up to the confluence with the Bonesgate Stream. The banks are lined with mature willow trees.

Nature Conservation Value: The NRA Biological Survey identified the section of river below the Green Lanes Stream to the Bonesgate Stream as having the highest biological quality in the catchment. This length provides fast flowing riffle habitats with sections of deeper water and pools. Aquatic plant communities are well developed, with emergent plants forming more or less continuous marginal growth. Kingfishers can be seen downstream from Ruxley Lane.

Historical/Cultural Associations: The Hogsmill River probably in the area around Ewell Court, formed the background to the painting of "Ophelia" by Sir John Millais and surrounding fields were depicted in the "Hireling Shepherd" by Holman Hunt. The 18th century Packhorse Bridge crosses the Ewell Court Stream close to its confluence with the Hogsmill. This narrow, arched brick bridge is probably a garden feature from Ewell Court House.

Planning Status: The riverside park is designated by Epsom and Ewell Borough Council as an Areas of Archaeological Importance. The Packhorse Bridge is a Grade II listed building.

Public Access and Recreation: All of the river and its tributary the Ewell Court Stream are within public open space.

Ownership: Epsom and Ewell Borough Council own and manage the Hogsmill Open Space. The river bed and banks are owned by the NRA.

MANAGEMENT STRATEGY	Cost
A. Investigate feasibility of removing flow regulating structures at confluence with Ewell Court Stream to create a wetland area. Replace concrete weirs with chalk stream glides.	40,000
B. Removal of unnecessary floodwalls and toe boarding to accelerate the natural process of channel recovery. Regrade banks. Replace concrete weir with chalk stream 'glides'.	20,000
C. Regrade steep sections of bank to form gentle slopes which will encourage wetland fringe communities.	15,000
D. Pollard mature willows.	2,000
E. Extend surfaced path on eastern bank of river.	9,000
Total	<u>£ 86,0000</u>

LIAISON REQUIRED

Epsom and Ewell Borough Council, Lower Mole Countryside Management Project.

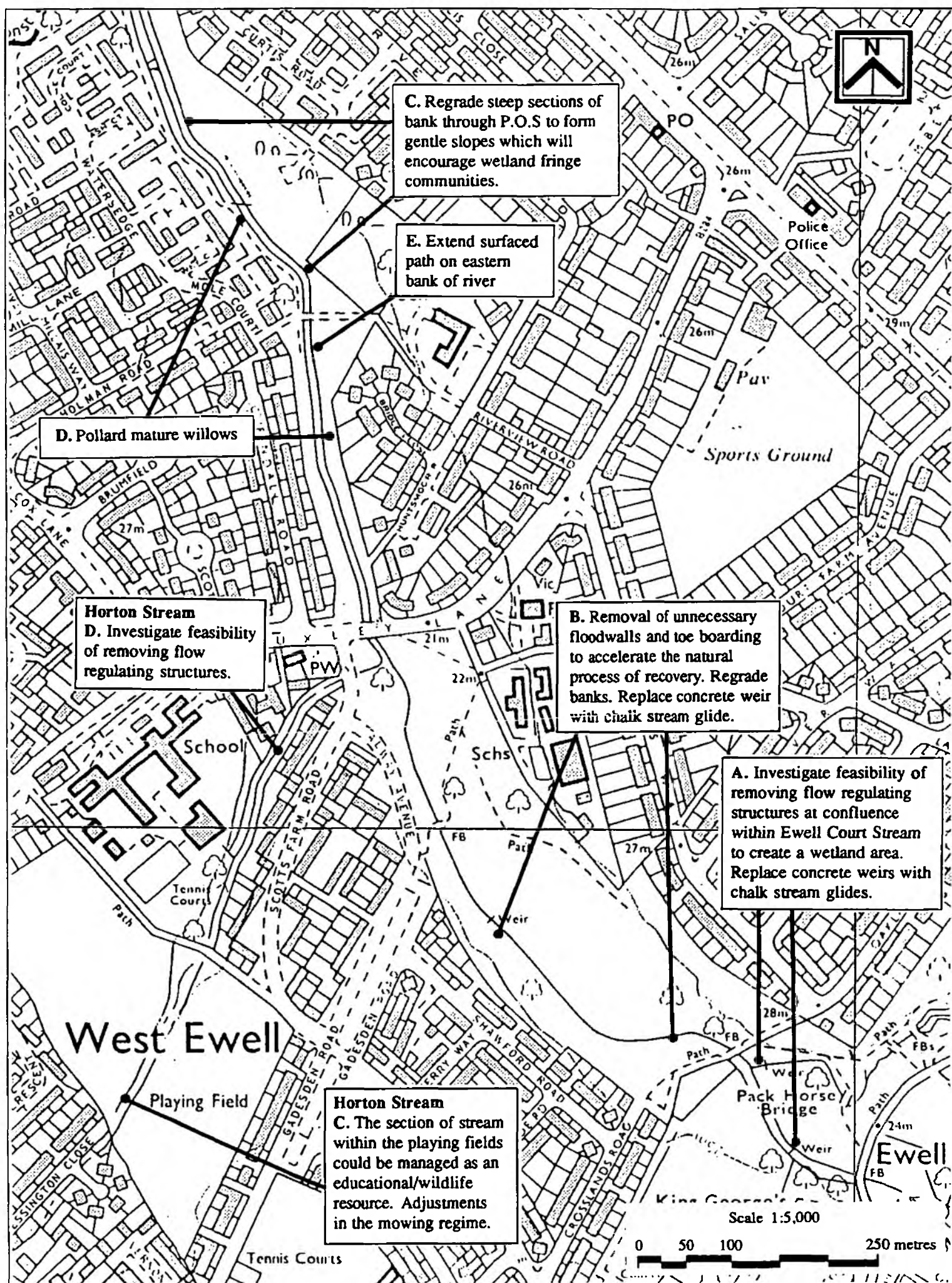


Figure 7.3 Detailed Assessment - Hogsmill Open Space - Ewell

HOGSMILL RIVER - TOLWORTH COURT AND RIVERHILL

See Figure 7.4

LANDSCAPE CONTEXT

Description of Watercourse: This section of river, downstream from the confluence with the Bonesgate Stream, was widened and straightened by Surrey County Council in the 1950s. Prior to these flood defence works the channel had been diverted and modified to drive the water-mill further downstream. The original meandering course of the river can be traced on a map by the sinuous historic boundaries between the Borough of Epsom and Ewell Borough Council and the Royal Borough of Kingston. The old course of the river ran close to Worcester Park Road and was filled in. A new straight channel was formed parallel to the road and the excavated material dumped along the northern boundary of the river. Woodland has grown up along both banks of the river, mainly composed of sycamore and willow, with a ground flora of ivy. Toe-boarding along the watercourse has rotted and bank material has slumped into the channel. This has encouraged a return to a more natural channel and the formation of in-stream features. To the north of the stream is the former estate of Tolworth Hall (now known as Riverhill House) which has been converted into a sports ground, show jumping arena and mobile home park.

Nature Conservation Value: London Ecology Unit have designated the woodland, pasture, stream and unmanaged grassland of Riverhill House a Site of Borough Importance in Kingston. The biological quality in this section is still good, but a uniform channel and loss of riffle habitats as a result of flow regulating structures and channel overdeepening reduced the diversity of aquatic plant and macroinvertebrate communities compared to upstream sections.

Historical/Cultural Associations: The remains of the moated manor house at Tolworth Court Farm are of archaeological importance. No extensive excavation has yet been carried out but documents available record a moated manor house with a gateway and a drawbridge. Outside the moat, fed by the river, was a water-mill known as Brayest Mulne. The remains of the old moat have become choked by vegetation.

Planning Status: Metropolitan Open Land, Area of Archaeological Importance and Site of Nature Conservation Importance.

Public Access and Recreation: The Hogsmill Walk which was opened in 1992 follows the northern boundary of the river as far as the road bridge serving the Riverhill Estate.

Ownership: Riverhill is owned by the Royal Borough of Kingston but leased to the Riverhill Estate, who look after the whole area. The river bed and banks are owned by the NRA.

MANAGEMENT STRATEGY	Cost
A. Install sediment traps and flow deflectors to increase sinuosity within channel.	6,000
B. Removal of toe boards to help bank recovery and narrow existing over-widened channel	15,000
C. Thinning of sycamore along river banks and coppicing of poor quality scrub near Tolworth Court Farm.	3,000
D. Replace footbridge.	5,000
E. Replace concrete weirs with random rock weirs which do not hamper fish migration.	8,000
Total	<u>£37,000</u>

LIAISON REQUIRED: Royal Borough of Kingston, Epsom and Ewell Borough Council, London Ecology Unit, Lower Mole Countryside Management Project, Museum of London.

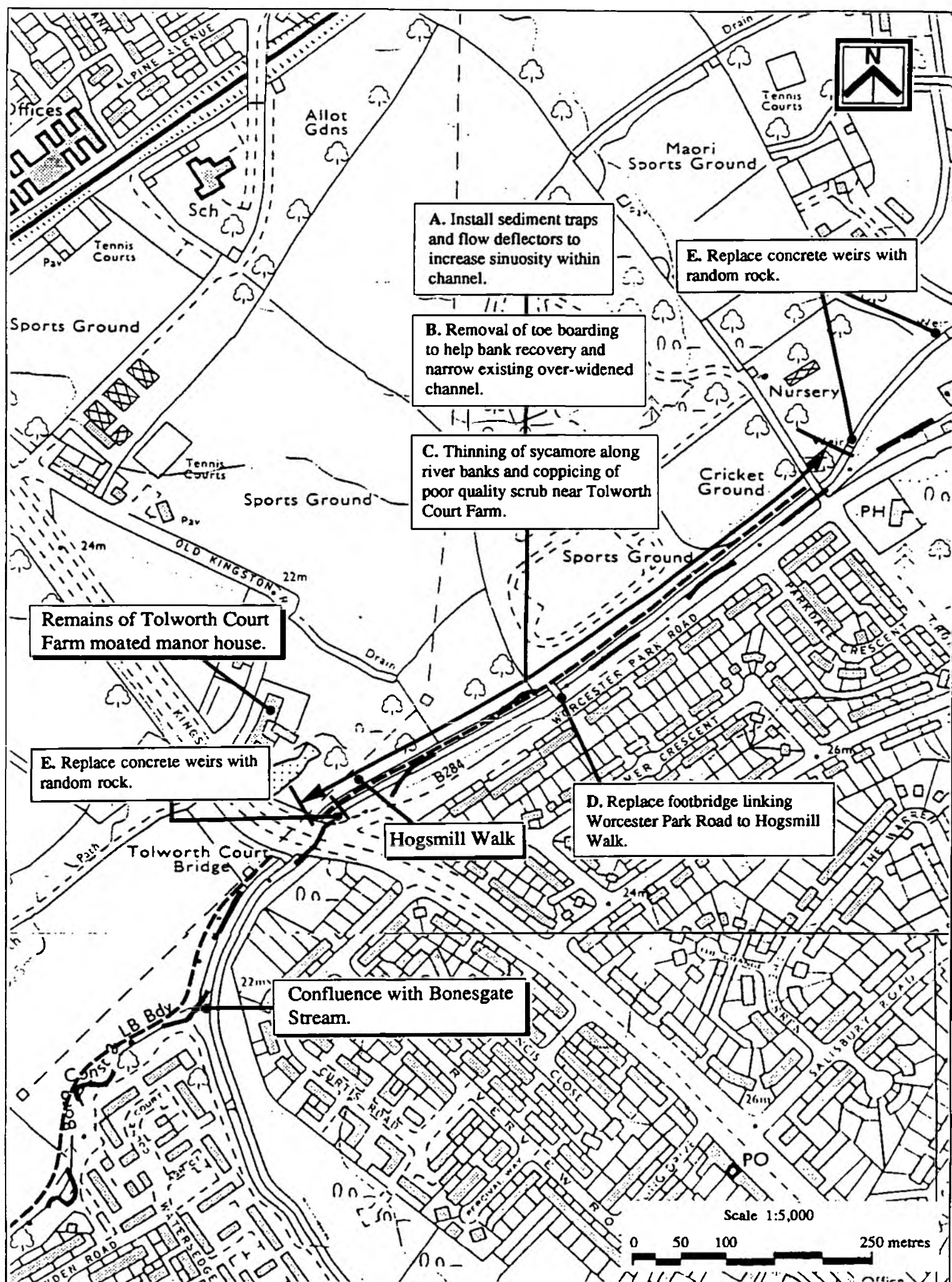


Figure 7.4 Detailed Assessment - Tolworth Court and River Hill

HOGSMILL RIVER - OLD MALDEN, HOGSMILL AND SOUTHWOOD OPEN SPACES See Figure 7.5

LANDSCAPE CONTEXT

Description of Watercourse: The river turns sharply north-west downstream from Old Malden Lane. On the sloping river terrace of the eastern bank stands the Church of St. John the Baptist, and the original village of Malden. The river has been artificially straightened throughout this length, and flows within an over-wide channel shaded by dense woodland. Toe boarding has begun to rot, causing bank material to slump into the channel. On the western bank of the river is an abandoned nursery and small grazed paddocks. Immediately south of the Malden Manor to Chessington railway line is an area of overgrown allotments.

To the north of the railway line Southwood Drive Open Space extends along the western bank of the river up to the A3 and on the eastern bank the Hogsmill Open Space rises up the river terrace slope. These open spaces contain scrub, tall herbs, semi-improved neutral grassland and mown amenity grass. Woodland occupies the southern end of the Hogsmill Open Space as well as most of the western bank of the river. The river, where shaded, is devoid of aquatic and marginal flora.

Nature Conservation Value: Old Malden Common and the Hogsmill Valley (Hogsmill Open Space and Southwood Open Space) are designated Sites of Borough Importance in Kingston by the London Ecology Unit. The biological quality of this section is fair/good. The river upstream of the A3 lacks riffle habitats and has steep bank with deeper, slow flowing water.

Historical/Cultural Associations: Malden, which took its name from Maeldune meaning the 'cross upon the hill', is mentioned in the Domesday Book. The cross upon the hill is thought to have formed the foundations of the Church of St. John the Baptist. There is a long history of settlement on the hill, remains from Iron Age, Roman, Norman and Medieval periods have been found. The church was rebuilt in 1610 and next to it is an 18th century manor house. Adam's Bristow Yard still has the remains of one of the old gunpowder mills which used to exist along the river in Malden Parish.

Planning Status: Two parts of the original village of Malden are designated a Conservation Area by the Royal Borough of Kingston, the first of which focuses on the church and manor house. Most of the river corridor is Metropolitan Open Land, a Site of Nature Conservation Importance and an Area of Archaeological Significance.

Public Access and Recreation: The Hogsmill Walk has been completed except for the missing link along the western bank of the river, and this is due to be implemented in the Spring of 1994.

Ownership: The public open space is owned by the Royal Borough of Kingston Leisure Services Committee. The river bed and banks are owned by the NRA.

MANAGEMENT STRATEGY	Cost
A. Removal of toe boarding and the installation of current deflectors/sediment traps to improve sinuosity.	20,000
B. Woodland management to improve species and structural diversity.	5,000
C. Interpretation facilities associated with the new stretch of the Hogsmill Walk to explain the historical significance of Old Malden and the gunpowder mills.	2,000
D. Tree and shrub planting to improve the setting of the river in the vicinity of the railway viaduct, abandoned allotments and the children's playground.	1,000
E. Localised remodelling of the bank to create bays and pools, shallow water berms.	15,000
Total	<u>£ 43,000</u>

LIAISON REQUIRED: Royal Borough of Kingston, London Ecology Unit, Lower Mole Countryside Management Project. The London Ecology Unit has prepared a Management Brief for the Hogsmill River Park.

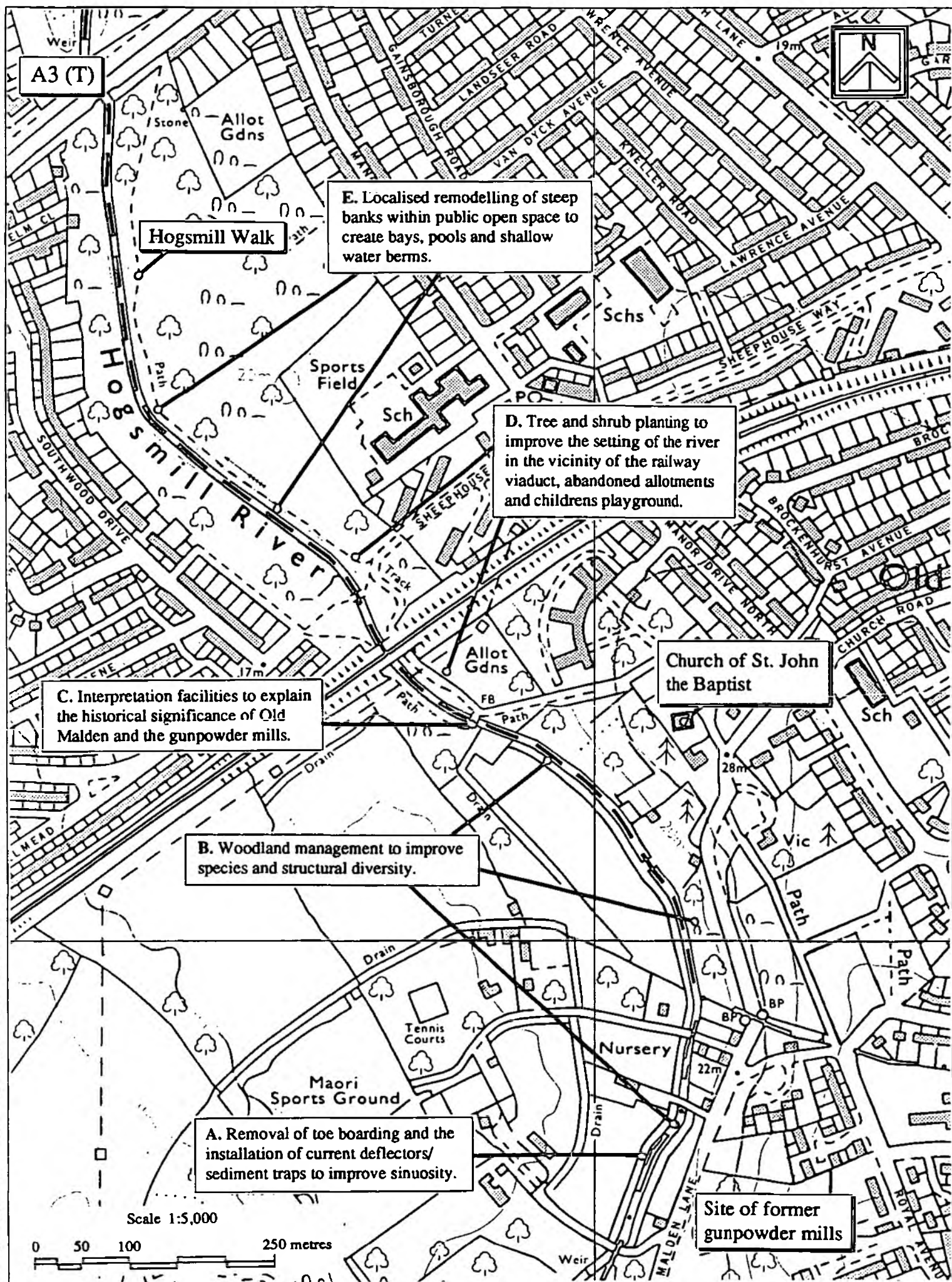


Figure 7.5 Detailed Assessment - Old Malden, Hogsmill and Southwood Open Spaces

HOGSMILL RIVER - ELMBRIDGE AVENUE AND ROSE WALK OPEN SPACES

See Figure 7.6

LANDSCAPE CONTEXT

Description of River Corridor: This section of the river extends north from the A3 Kingston Bypass to the Waterloo to Surbiton railway line. The Hogsmill River Park forms a long ribbon of open space on the western bank of the river. On the eastern side are private sports grounds and a public recreation ground. The site is subdivided into the Elmbridge Avenue Open Space extending up to the confluence of the Tolworth Brook. The Rose Walk Open Space continues north up to the railway line.

The river was widened and straightened by Surrey County Council in the 1950s. Much of the original toe boarding has now rotted away, and the banks have slumped, re-establishing a more natural and sinuous channel 3-4 metres in width with a gravel bed. The banks of the stream are fringed in places with reeds and pondweed trails in the water. Further up the banks are thick growths of nettles, hemlock and hogweed. Himalayan balsam is invasive. Occasional willows and alder also line the river bank. The riverside park contains a mixture of habitats including neutral grassland, amenity grassland, scrub, patches of marshy alluvial meadow, two small areas of fen carr woodland and secondary woodland originated from the various field boundary hedgerows. The Rose Walk Open Space was a former dump for building waste and was reclaimed in the 1960s. Open rough grassland with tall herb species cover the majority of the area.

Nature Conservation Value: The riverside park is designated by the London Ecology Unit as a Site of Borough Importance Grade 1 in Kingston. It has a high value for wildlife. Overall habitat diversity is an important feature, including the fen carr, the river and the neutral grassland. A small block of woodland just to the north of the A3 called Hogsmill Wood Nature Reserve is managed by London Wildlife Trust. The biological quality of this section is fair.

Historical/Cultural Associations: Maps of the nineteenth century shows this part of the valley a patchwork of fields, the former hedgerows of which can still be traced. A picturesque wooden trellis bridge previously crossed the river.

Planning Status: The whole of the riverside park is designated as Metropolitan Open Land and also as a Site of Nature Conservation Importance by the Royal Borough of Kingston.

Public Access and Recreation: The Hogsmill River Park is one of the most intensively used of the public open spaces alongside the river. The Hogsmill Walk follows a series of mown rides but there is no surfaced footpath. Public information boards are at the entrances to the park. A new footbridge near Hogsmill Wood has recently been installed.

Ownership: The riverside park is owned by the Royal Borough of Kingston. The river bed and banks are owned by the NRA.

MANAGEMENT STRATEGY	Cost
A. Replace concrete weir with random rock weir.	5,000
B. The extension of fen areas by digging out shallow scrapes from adjacent rough meadow and connecting them to existing ditches, cleaned out to increase water input.	8,000
C. Investigate feasibility of reinstating meanders and a natural channel over straightened section.	150,000
D. The laying of a permanent footpath alongside the river.	13,000
E. Woodland management to improve species and structural diversity including thinning of even-aged elm stands. The control of scrub and tall herb species to prevent their encroachment into rough meadow areas.	1,000
F. New woodland planting along the northern boundary of Rose Walk Open Space to screen the busy railway line.	3,000
G. Localised remodelling of steep river banks.	10,000
Total	<u>£190,000</u>

LIAISON REQUIRED: The Royal Borough of Kingston, London Ecology Unit, English Nature, London Wildlife Trust. The London Ecology Unit has prepared a Management Brief for the Hogsmill River Park.

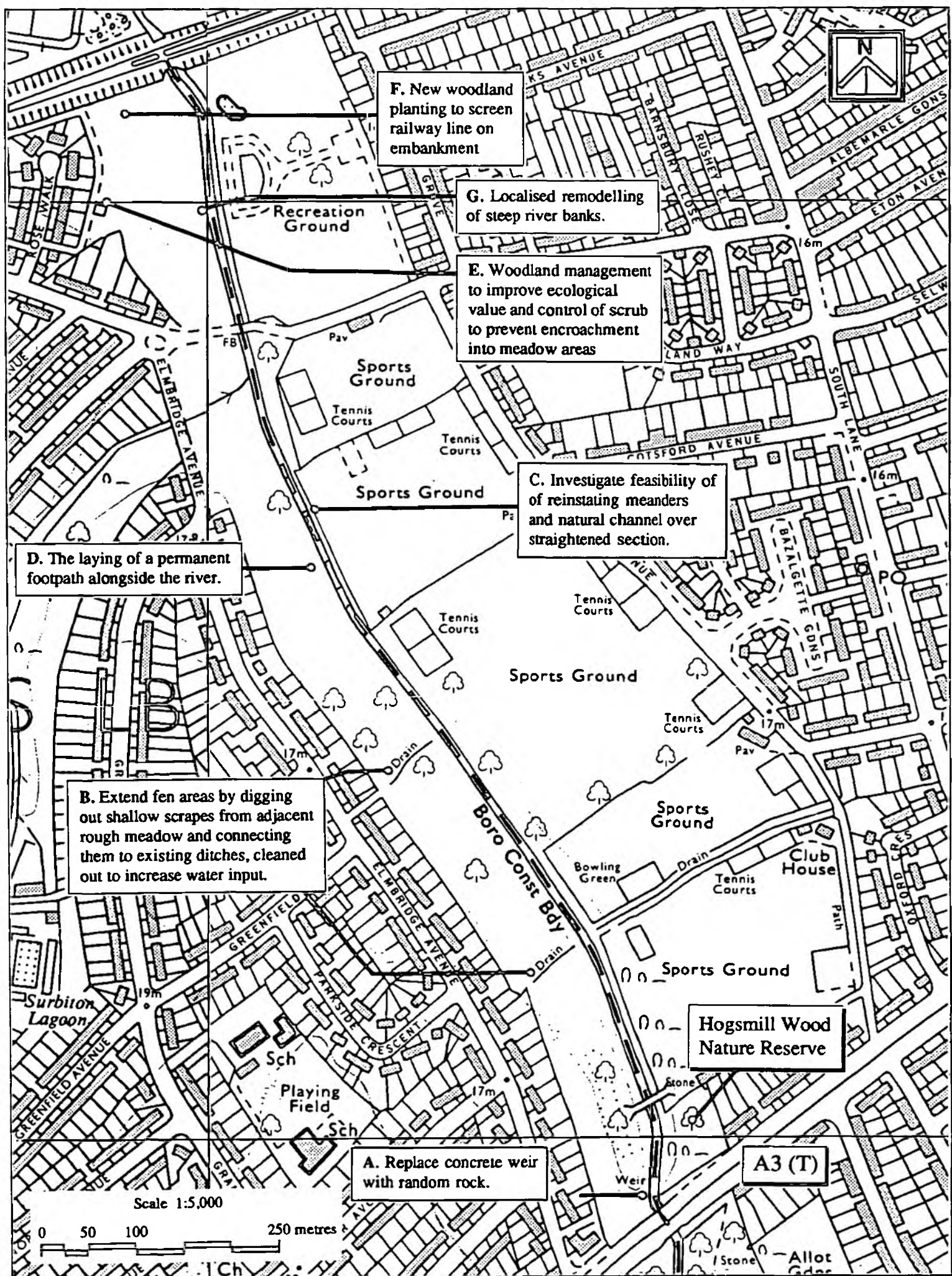


Figure 7.6 Detailed Assessment - Elmbridge Avenue and Rose Walk Open Spaces

HOGSMILL RIVER - SEWAGE TREATMENT WORKS AND KINGSTON CEMETERY See Figure 7.7

LANDSCAPE CONTEXT

Description of Watercourse: This section of the river extends downstream from the Surbiton to Waterloo main line, running to the north of the sewage works and to the south of Kingston Cemetery. The river flows within a cutting with steep, lushly vegetated banks and the river itself is shallow with a gravel bed. The course of the river was completely realigned as part of the flood alleviation scheme implemented by Surrey County Council in the 1950s; previously the river meandered to the north across the area now occupied by the Kingsmeadow Sports Stadium

Extending up the banks is a mass of nettles and bramble and in places the highly invasive Himalayan Balsam and Japanese Knotweed. Part of the banks have slumped and the vegetation overhangs the water's edge. Willows, ash and sycamore line the river together with birch scrub. Raised banks along the boundary with the sewage works increase the height of the cutting. To the north-east of the river and to the west of the sewage work are disused sludge beds and settlement lagoons which have been taken over by vegetation. The river remains in cutting past Kingston Cemetery. The south-eastern boundary of the cemetery is still defined by the old course of the river. A thin strip of neglected woodland adjoins the river.

Nature Conservation Value: The sewage works and river are designated by the London Ecology Unit as a Grade 1 Site of Borough Importance in Kingston, principally because of the wealth of bird life in the locality. Water rails, kingfishers, sand martins and grey wagtails breed along the river. The cemetery is a Site of Local Importance. The biological quality remains fair, including below the STW outfall, but deteriorates upon entering the concrete trapezoidal channel below.

Planning Status: The sewage works, cemetery and sports ground are designated Metropolitan Open Land. The disused settlement lagoons to the north of the river are planned for recreational development.

Public Access and Recreation: Public access to the river is limited to the grounds of the cemetery and Kingsmeadow Stadium. The Royal Borough of Kingston propose to extend the Hogsmill Walk along the northern bank of the river as part of the planned recreation development.

Ownership: The Kingsmeadow Stadium and the cemetery are owned by the Royal Borough of Kingston. The sewage works is owned by Thames Water. The river bed and banks are owned by the NRA.

MANAGEMENT STRATEGY	Cost
A. Liaise with the Royal Borough of Kingston about improving the appearance of the Council Depot adjoining industrial land UDP Site No. 38.	5,000
B. Liaise with the Royal Borough of Kingston about the design of the new recreational development (UDP Site No. 37) which offers significant opportunities for environmental enhancement including realigning the river to follow its former meandering source and creating off-stream wetlands.	N/A
C. Install in-stream deflectors and concrete berms submerged and planted with aquatics to increase sinuosity and aid the migration of coarse fish.	10,000
D. Coppicing and pollarding of riverside trees.	3,000
E. Management of neglected woodland in the cemetery.	2,000
F. Liaise with Royal Borough of Kingston about the siting of the Hogsmill Walk to be extended along the north bank of the river.	N/A
G. Install in-stream deflectors to increase sinuosity over straight section between Villiers Road and cemetery. Realign path to provide space for planting.	10,000
Total	£ 30,000

LIAISON REQUIRED: The Royal Borough of Kingston, London Ecology Unit, English Nature and Thames Water

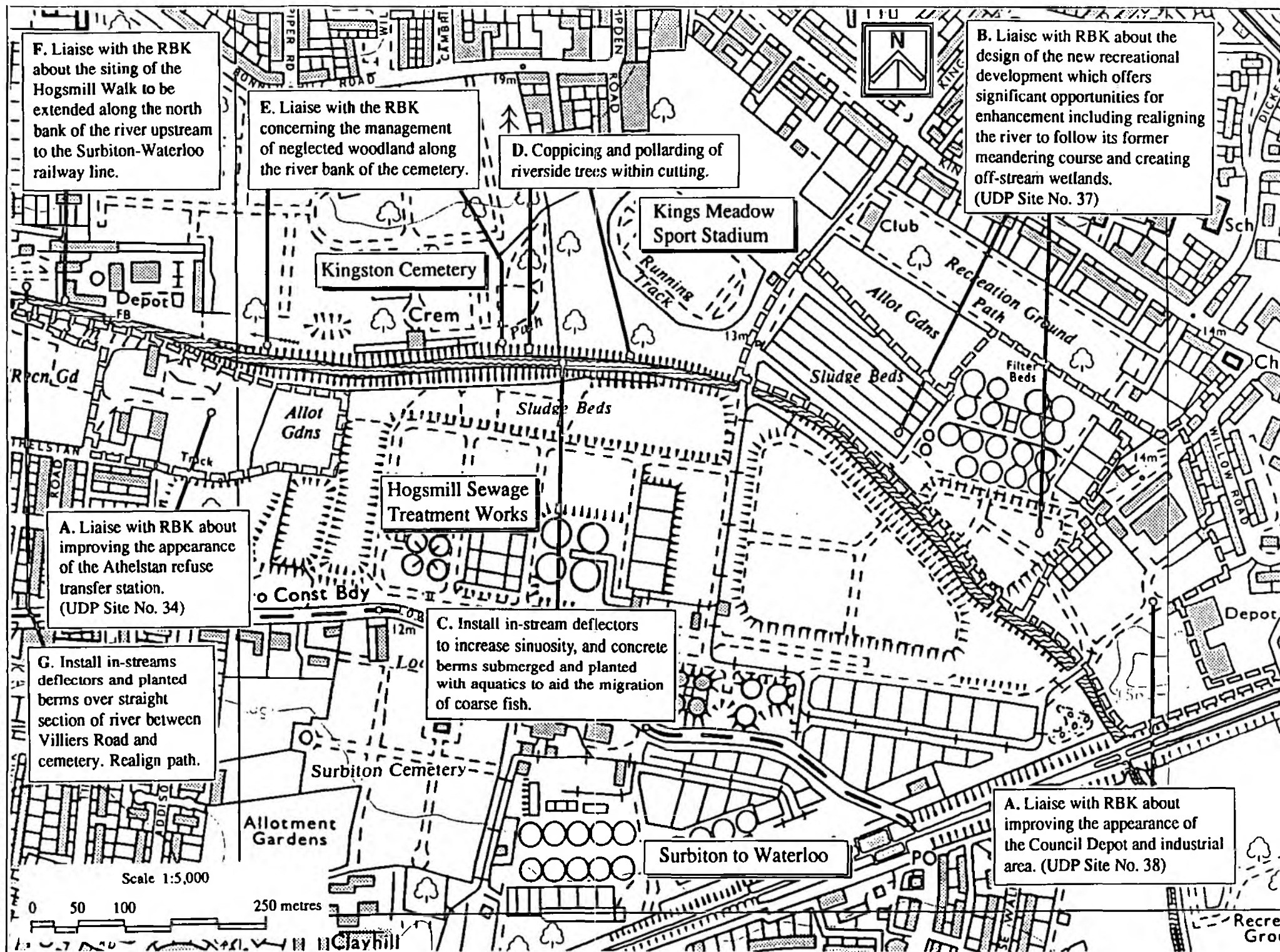


Figure 7.7 Detailed Assessment - Hogsmill Sewage Works

KINGSTON TOWN CENTRE

See Figure 7.8

LANDSCAPE CONTEXT

Description of Watercourse: Downstream from Kingston Cemetery the river is channelised and flows within a wide straight channel, between an industrial estate on the north bank and a council refuse transfer station and recreation ground on the south bank. To the west of the Villiers Road bridge, the river is flanked by residential and educational buildings. The channel divides at the former water mill at the end of Mill Street. The river is crossed by a number of roads which are the best viewpoints. Downstream from the inner relief road the final section of the river is urban in character and passes through the Guildhall complex and the historic centre of Kingston.

Nature Conservation Value: Although the vertical walled channel mostly precludes vegetation getting a foothold, there are places where gravelly margins remain. Submerged vegetation is largely restricted to algae.

Historical/Cultural Associations: Within the historic core of the town, the river flows under the Clattern Bridge close to the Coronation Stone, both scheduled ancient monuments. There were a number of mills on the Hogsmill at Kingston. Mill House, next to the Villiers Road Bridge, is the only surviving building.

Planning Status: The river runs close to three Conservation Areas and a number of listed buildings, including the Guildhall and Mill House.

Public Access and Recreation: The Hogsmill Walk runs alongside or close to the river for the majority of this urban section. To the east of Villiers Road the walk remains to be implemented.

Ownership: The river bed and banks are owned by the NRA.

MANAGEMENT STRATEGY

Space and hydrological constraints limit opportunities to enhance the river. The main scope for enhancement will occur when the sites identified next to the river in the UDP come forward. The NRA should ensure that development proposals respect the setting of the river and realise its potential as a landscape, nature conservation and recreation resource.

- A. Refuse transfer station and land at rear, Athelstan Road, Kingston (UDP Site No. 34)
- B. Recent Planning application (September 1993) for student residences at Middle Mill House Works on Hogsmill Island.
- C. 1 Penrhyn Road, UDP Site No. 32.
- D. Guildhall/County Court Complex, UDP Site No. 29.
- E. High Street/Emm's Passage/King's Passage/Market Place, UDP Site No. 4.

N/A

LIAISON REQUIRED

The Royal Borough of Kingston, London Ecology Unit

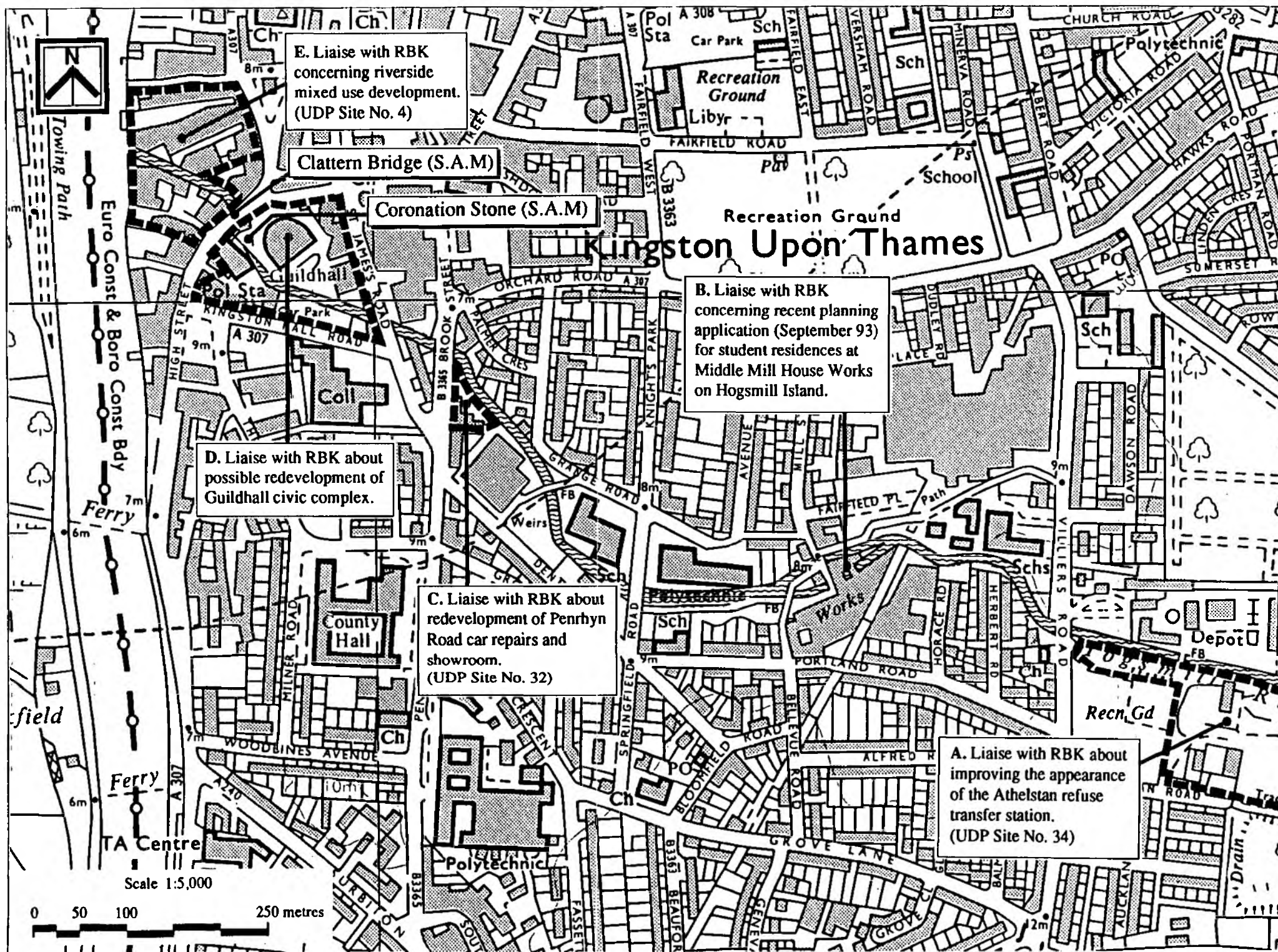


Figure 7.8 Detailed Assessment - Kingston Town Centre

GREEN LANES STREAM

See Figure 7.9

LANDSCAPE CONTEXT

Description of Watercourse: The stream rises in Epsom Common and flows for nearly 3 kilometres before joining the Hogsmill just to the west of the Epsom-Waterloo railway line. This study only considers the final kilometre of the stream downstream from the B284 Hook Road. The tributary was extensively straightened and resectioned as part of the Surrey County Council land drainage scheme implemented in the 1950s and 1960s. The watercourse was realigned within a new channel between Chessington Road and Hook Road and locally channelised near the Epsom and Ewell sewage works.

Downstream from Hook Road the stream flows within a corridor of public open space, between the Longmead Road to the west and the Longmead Trading Estate to housing to the east. The banks of the stream are uniform and constrained by toe boarding. The stream is culverted under the Chessington Road before flowing between the two Green Lanes into public open space. The stream is crossed in four places by footbridges. The confluence of the stream with the Hogsmill has been channelised.

Nature Conservation Value: The stream takes all the surface water run off from Epsom and the adjacent industrial estate. This can result in intermittent pollution. Dense growth of filamentous algae choke the stream, particularly during the summer months. The biological quality as measured by the fauna of the stream is fair.

Planning Status: The public open space either side of the stream is designated by the Borough of Epsom and Ewell as 'Open Spaces in Urban Areas'.

Public Access and Recreation:

Ownership: The public open space is owned and managed by the Borough of Epsom and Ewell.

MANAGEMENT STRATEGY	Cost
The stream provides significant opportunities for restoration and enhancement including:	
A. The removal of unnecessary toe-boarding and the reinstatement of a meandering natural edged channel, where space permits.	30,000
B. The installation of current deflectors/gravel traps to restore the channel to a more natural flow width. The use of a two stage channel to allow the formation of shallow water berms and the establishment of marginal vegetation.	40,000
C. Encourage the Borough of Epsom and Ewell to adjust the mowing regime within the public open space to create a distinction between frequently cut amenity grass and meadow with wild flowers cut 2-4 times a year.	N/A
D. Investigate feasibility of removing flow regulating structures at confluence with Hogsmill to create a wetland area (see Figure 7.2)	N/A
Total	<u>£ 70,000</u>

LIAISON REQUIRED: The Borough of Epsom and Ewell, Lower Mole Countryside Management Project.

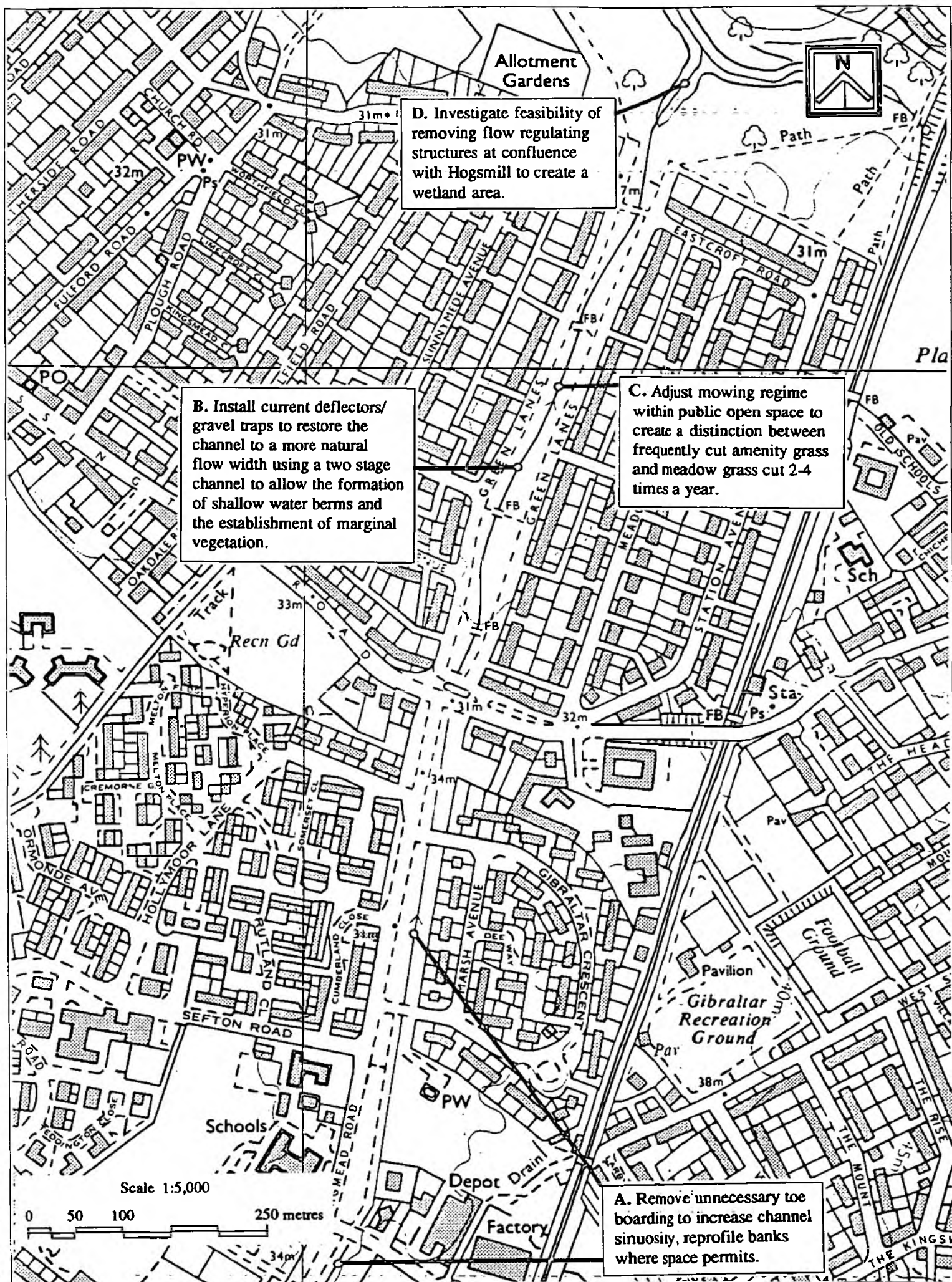


Figure 7.9 Detailed Assessment - Green Lanes Stream

HORTON STREAM

See Figures 7.10 and 7.3

LANDSCAPE CONTEXT

Description of Watercourse: The source of this small tributary is within the grounds of Long Grove Hospital and not included within the study area. The watercourse is in culvert until just outside the boundary of the hospital. After emerging from the hospital culvert, the watercourse flows within a narrow ditch alongside a hedgerow, which separates the golf course and an area of hay meadow within Horton Country Park.

The tributary is then overgrown with vegetation, before entering the first of two man made ponds which have been formed by damming the stream. The upstream pond is fringed by bulrushes and marsh. The downstream pond is more ornamental and is within the golf course. The stream then passes beneath a wooded embankment which is the former track of the Horton Light Railway.

The tributary passes beneath the Chessington Road in culvert, and then runs through the gardens of Chessington Close within a narrow channel. The stream crosses the playing fields of Epsom and Ewell High School enclosed within an overgrown hedgerow. There is toe boarding on the lower part of the stream from the school grounds downstream to about 50 metres upstream of Scotts Farm Road. At this point there is a concrete step weir about 1.5 metres high.

Nature Conservation Value: The hay meadows, wetland and ponds within Horton Country Park are important wildlife habitats. The biological quality of the stream at a site just above the Hogsmill was good, which represented the best fauna of any tributary of the Hogsmill. Further upstream, above Chessington Road, biological quality was fair.

Historical/Cultural Associations: The stream is severed by the track of the former Horton Light Railway which was built to help construct, and later supply the Epsom hospitals cluster. It was closed in 1950.

Planning Status: South of Chessington Road and Horton Country Park the stream is within the Green Belt. The playing fields of Epsom and Ewell High School are designated 'Open Spaces in Urban Areas'. Long Grove Hospital is now closed and is part of a major redevelopment planned for the hospitals cluster.

Public Access and Recreation: Within the country park the stream and its ponds are accessible. The ponds are part of a signposted circular walk.

Ownership: The Borough of Epsom and Ewell own the country park and the school playing fields. Mid-Surrey Health Authority own Long Grove Hospital.

MANAGEMENT STRATEGY	Cost
A. Outside of the study area, the upper reaches of the stream within the grounds of Long Grove Hospital could be taken out of culvert and enhanced as part of the redevelopment planned for the former hospital.	N/A
B. Enlargement of pond to extend wetland area and control of invasive reedmacro.	3,000
C. The section of stream within the playing fields of Epsom and Ewell High School could be restored and managed as an educational/wildlife resource. Adjustments in the mowing regime would provide a transition between the close mown grass and the hedgerow (see Figure 7.3).	2,000
D. The lower reaches are impounded by flow regulating structures, and the feasibility of removing these should be investigated (see Figure 7.3).	<u>3,000</u>
Total	<u>£ 8,000</u>

LIAISON REQUIRED: Borough of Epsom and Ewell, Horton Country Park Ranger Service, Mid-Surrey Health Authority, Lower Mole Countryside Management Project.

BONESGATE STREAM - PARK FARM AND CHESSINGTON WOOD

See Figure 7.11

LANDSCAPE CONTEXT

Description of Watercourse: The Bonesgate Stream rises on the north facing slopes of Ashted Common, and flows along the eastern side of Chessington Wood to the north of Rushett Lane. The woodland lies on a flat area of London Clay and is dominated by oak. Dense thickets of scrub and regenerating elm enclose the stream. Downstream from Chessington Wood, the stream meanders within a narrow strip of woodland through gently undulating mixed farmland. The steep clay banks and heavy shading of the trees and scrub, restrict the aquatic flora. At the southern end, the woodland is dominated by hawthorn, with increasing quantities of oak, ash and field maple downstream towards Castle Hill. The stream is no more than a metre in width, with steep clay banks tangled with roots. It has been relatively unmodified by man and retains its meandering course. There are short riffle sequences throughout and river cliffs.

Nature Conservation Value: Chessington Wood and the stream downstream to Castle Hill are designated Sites of Borough Importance in Kingston by the London Ecology Unit.

Historical/Cultural Associations: According to local belief the Bonesgate Stream derived its name from plague pits used to bury the bones of victims of the plague in London. This derivation is however uncertain. In medieval times the valley was used as a deer park owned by Merton College, Oxford.

Planning Status: Green Belt, Site of Nature Conservation Importance, Area of Archaeological Importance.

Public Access and Recreation: There is no public path alongside this stretch of the stream, but it is crossed by several public footpaths. It flows close to Green Lane, an ancient drove road and public right of way.

Ownership: Merton College

MANAGEMENT STRATEGY	Cost
A. Leaving the channel untouched as far as possible to conserve its structural diversity and variety of habitats.	N/A
B. Coppicing of trees and scrub near the stream to increase light and the development of a more diverse marginal and aquatic flora.	7,000
C. Discuss with landowner/farmer tenant the Set Aside of a strip 5-15 metres in width adjacent to the stream where it crosses arable farmland. This could be managed as low productivity grassland, untreated with chemicals.	N/A
D. Create an off-stream pond within damp valley pasture, by agreement with landowner/farmer tenant.	3,000
Total	<u>£ 10,000</u>

LIAISON REQUIRED: Royal Borough of Kingston, Lower Mole Countryside Management Project, London Ecology Unit, Merton College and tenant farmer.

BONESGATE STREAM - CASTLE HILL AND BONESGATE OPEN SPACE

See Figure 7.12

LANDSCAPE CONTEXT

Description of Watercourse: The middle reaches of the Bonesgate Stream have been spared substantial modification by man, and the stream retains a semi-natural meandering course. The stream flows within a narrow corridor of dense woodland through Castle Hill and Bonesgate Open Space. There is little or no bankside or aquatic vegetation because of the heavy shading. The stream has steep clay banks, which increase to 5 metres in height where the stream has formed a down cut channel at Castle Hill. There is a well defined sequence of pools and riffles with gravel bars and berms.

Nature Conservation Value: Castle Hill and Bonesgate Open Space are designated a Site of Borough Importance in Kingston by the London Ecology Unit. The mature oak trees within Castle Hill date back to the 19th century, however the abundance of rare plants, like wood melick and anemone, indicate that this site was an ancient woodland.

Historical/Cultural Associations: The steeply sloping bank in the centre of the Castle Hill woodland marks the site of a medieval hunting lodge which was located at the end of an extensive deer park owned by Merton College, Oxford. The steep hummocks either side of the stream at Castle Hill are thought to be the remains of a dam across the stream for a long lost mill.

Planning Status: Castle Hill is just within the northern limit of the Green Belt and Bonesgate Open Space is designated Metropolitan Open Land. Castle Hill is a Scheduled Ancient Monument. All of the stream is within an Area of Archaeological Importance and is also a Site of Nature Conservation Importance. Castle Hill was declared a Local Nature Reserve in 1992.

Public Access and Recreation: The Hogsmill Walk follows the eastern side of the stream through Bonesgate Open Space and into Castle Hill, where The Lower Mole Countryside Management project have completed various public access and interpretation improvements at entrances and along pathways. The recently way-marked circular Chessington Walk also crosses the stream.

Ownership: The north-west corner of Castle Hill is owned by the Royal Borough of Kingston. The rest of Castle Hill is owned by Merton College, Oxford and has been leased by the Royal Borough of Kingston since August 1988. Bonesgate Open Space is owned entirely by the Royal Borough of Kingston.

MANAGEMENT STRATEGY	Cost
The London Ecology Unit has prepared Management Briefs for both Castle Hill and Bonesgate Open Space.	
A. Investigate the feasibility of restoring the former meandering course of the stream over straightened section.	40,000
B. Coppicing and canopy thinning of riverside trees to improve structural and species diversity.	6,000
C. Adjust frequency of mowing within Bonesgate Open Space to create a scalloped woodland edge. Introduce wild flowers to diversify amenity grass sward.	N/A
D. The provision of a new footbridge linking Thrigby Road to the Hogsmill Walk, near where the pipeline bridges the stream.	5,000
E. New tree and shrub planting to screen rear of properties in Ashby Avenue.	4,000
Total	<u>£ 55,000</u>

LIAISON REQUIRED: Royal Borough of Kingston, London Ecology Unit, Lower Mole Countryside Management Project, English Nature

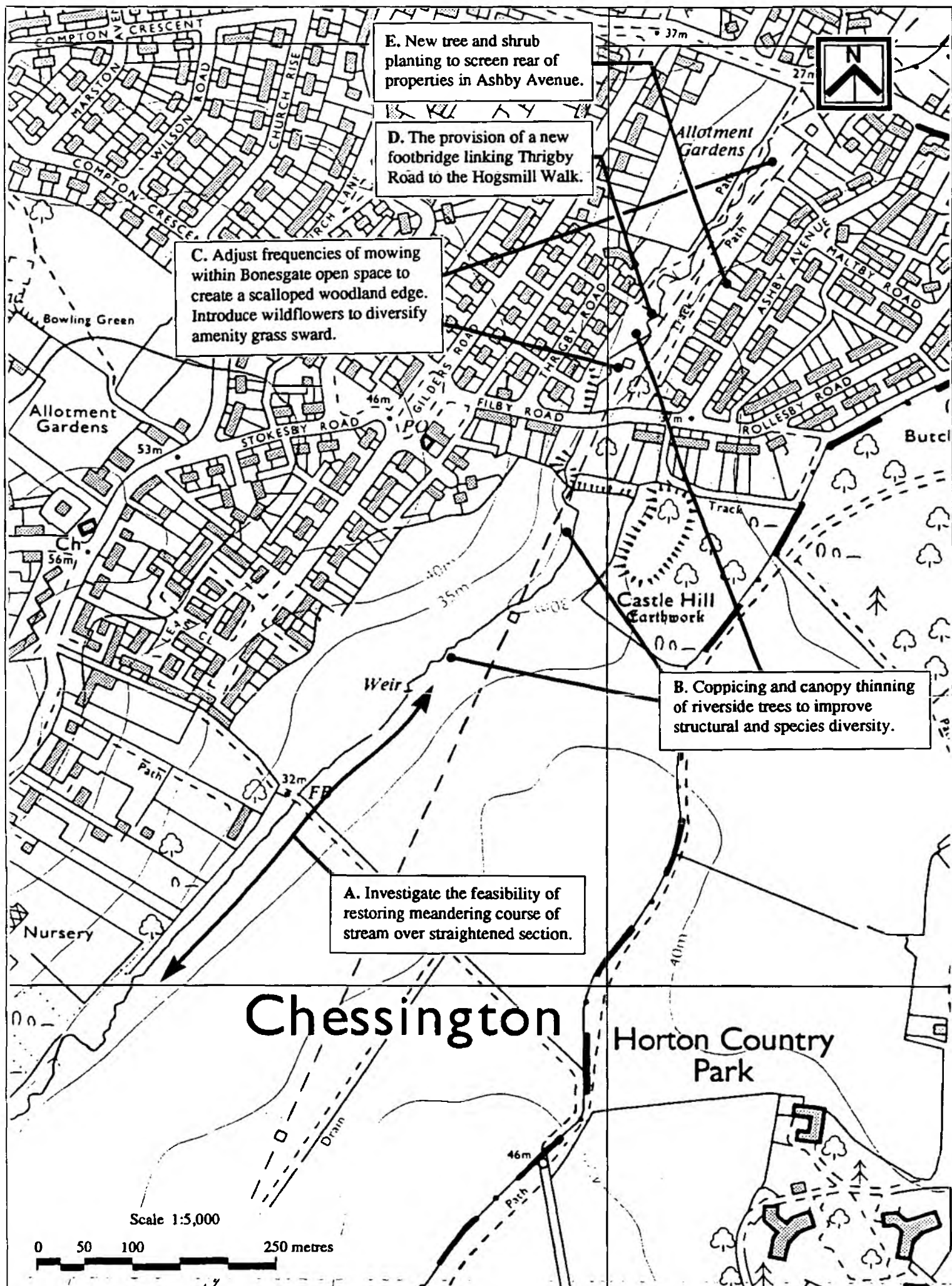


Figure 7.12 Detailed Assessment - Bonesgate Stream, Castle Hill

BONESGATE STREAM - TOLWORTH COURT FARM

See Figure 7.13

LANDSCAPE CONTEXT

Description of Watercourse: Downstream from Moor Lane to its confluence with the Hogsmill, the stream has been substantially widened and straightened. Its previous meandering course was replaced in the 1960s by an over-wide channel with toe boarding. The banks are reinforced with concrete near bridges, weirs and pipe outfalls. The stream is heavily shaded in parts by scrub and large over-mature willows. The watercourse forms the boundary between the Borough of Epsom and Ewell and The Royal Borough of Kingston. To the south, within Epsom and Ewell, post-war housing, abandoned allotments and a gypsy site abut the stream. To the north there is a narrow corridor of public open space (Chessington Park) before the valley opens out downstream within the Royal Borough of Kingston at Tolworth Court Farm. The farm covers 90 hectares and is criss-crossed by old hedgelines with 200-300 year old oak standards. Unimproved grassland and former hay meadow adjoin the stream. The confluence with the Hogsmill is channelised.

Nature Conservation Value: Tolworth Court Farm is designated by the London Ecology Unit as a Site of Borough Importance in Kingston.

Historical/Cultural Associations: Tolworth Court Farm has a long history of settlement, with evidence that the farm site has been used since medieval times. The field system has changed little since the Ordnance Survey 1st Edition in 1865.

Planning Status: Tolworth Court Farm is designated by the Royal Borough of Kingston as Metropolitan Open Land, an Area of Archaeological Importance and a Site of Nature Conservation Importance.

Public Access and Recreation: The Hogsmill Walk follows the northern side of the stream, and Epsom and Ewell's Round the Borough Walk follows the southern side. Tolworth Court Farm is crossed by two public rights of way. One of these is an old drove road or green lane. Tolworth Court Farm has considerable potential for countryside recreation and is an important landscape/nature conservation/archaeological resource. Draft management proposals have been prepared by the Lower Mole Project Countryside Project for the Royal Borough of Kingston.

Ownership: The Royal Borough of Kingston have recently purchased Tolworth Court Farm. The thin corridor of public open space on the southern edge of the stream is owned by Epsom and Ewell.

MANAGEMENT STRATEGY	Cost
A. New tree and shrub planting to enhance the setting of the stream within Chessington Park. Regrade steep banks to form a gentle slope down to the stream.	3,000
B. Management of woodland and scrub, control of flytipping.	3,000
C. Signpost and surface missing section of Hogsmill Walk and introduce measures to limit access by motorcycles and horses. Extend surfaced footpath up to confluence with Hogsmill.	15,000
D. Tree and shrub planting to help screen the gypsy site and improve the setting of the stream at Cox Lane. Control of flytipping.	4,000
E. Investigate feasibility of restoring stream to its former meandering course along the Borough boundary within Tolworth Court Farm.	180,000
F. Investigate feasibility of removing weirs and flow regulating structures at the confluence with the Hogsmill.	20,000
G. Install new footbridge near confluence with Hogsmill.	5,000
Total	£ 230,000

LIAISON REQUIRED: Royal Borough of Kingston, Epsom and Ewell Borough Council, Lower Mole Countryside Management Project, London Ecology Unit, English Nature, Museum of London.

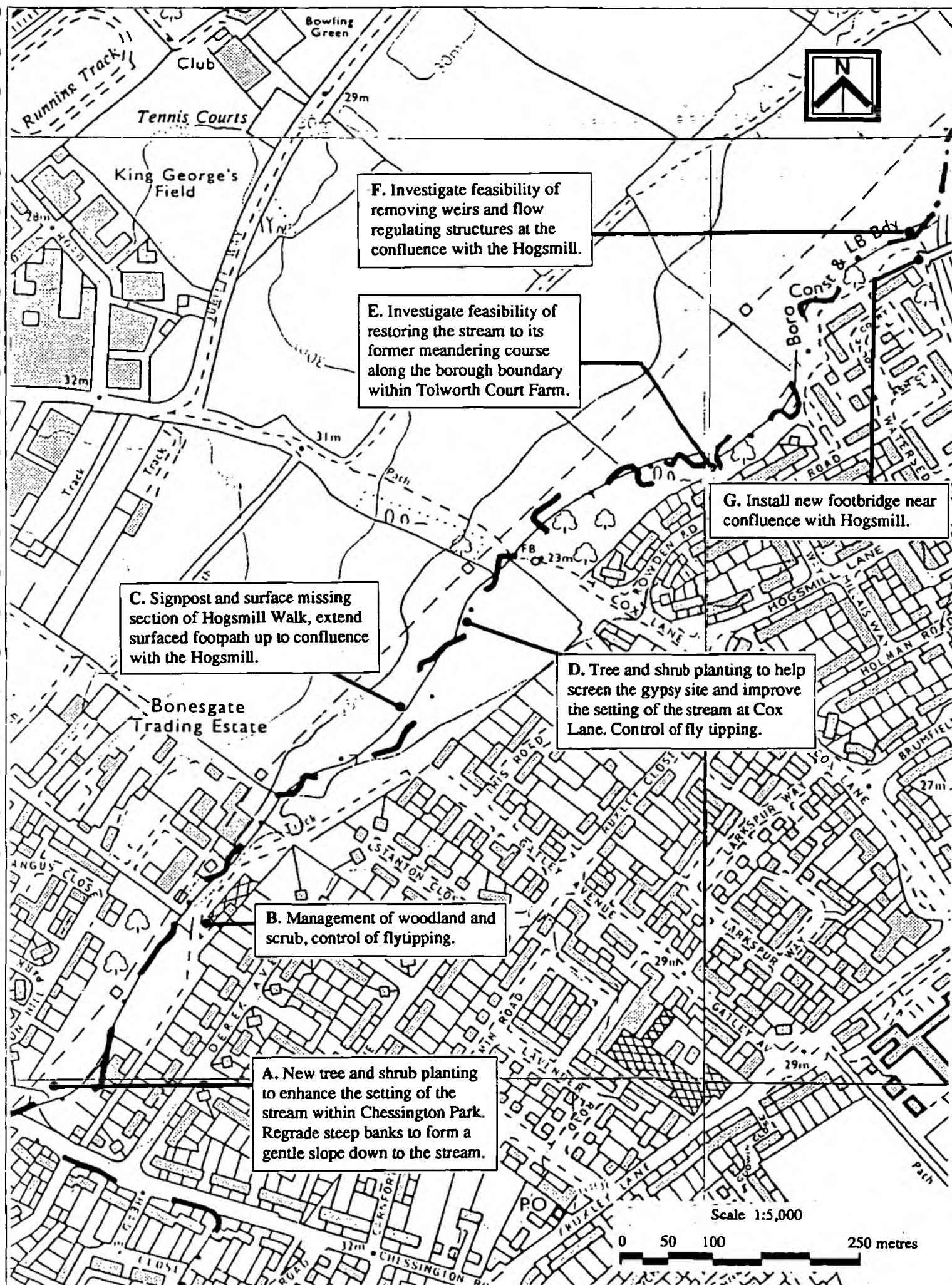


Figure 7.13 Detailed Assessment - Bonesgate Stream - Tolworth Court

SURBITON STREAM

See Figure 7.14

LANDSCAPE CONTEXT

Description of Watercourse: The brook rises as a spring at The Grapsome, a small woodland near Claygate. The section included in this study extends from King Charles Recreation Ground to its confluence with the Hogsmill in Elmbridge Avenue Open Space. The brook flows within a vertical walled channel downstream from King Charles Road, through the recreation ground, abandoned allotments and the old Surbiton Lagoon site, which has recently been made into an informal park. The watercourse is downgraded, and has completely lost its former character over this section.

The character of the brook changes when it enters Raeburn Open Space. The brook flows down the centre of the site within a narrow strip of woodland and elm scrub. The brook is constrained at first within straightened banks with intermittent sections of vertical walling. Downstream, the channel has recovered some of its sinuosity and a sequence of pools and riffles is beginning to re-establish. The banks are steep throughout. About half-way down stream a bridge provides access for Leisure Department vehicles. Immediately after the bridge, the brook disappears under dense elm scrub, until it reaches Elmbridge Avenue.

Nature Conservation Value: Raeburn Open Space is designated by the London Ecology Unit as a Grade II Site of Borough Importance in Kingston. Edith Garden Allotments, a narrow strip of abandoned allotments between back gardens, is a Site of Local Importance and a local nature reserve. The biological quality of this stream was found to be fair, which is encouraging for a watercourse subject to substantial urban run-off and culverted through a large part of Surbiton.

Planning Status: Raeburn Open Space and the former Surbiton Lagoon site are designated Metropolitan Open Land. The abandoned allotments next to King Charles Recreation Ground are planned for redevelopment.

Public Access and Recreation: There is access to the brook within Raeburn Open Space and the old Surbiton Lagoon site. Within King Charles Recreation Ground the brook is fenced off. There is no public access to the allotments.

Ownership: All of the land alongside the brook including Raeburn Open Space is owned by the Royal Borough of Kingston.

MANAGEMENT STRATEGY	Cost
A. Remove concrete floodwalls in King Charles Recreation Ground to form two stage channel retained with timber edging.	30,000
B. Remove concrete floodwall on Tolworth Main Allotments side of water course and liaise with the Royal Borough of Kingston concerning extension of riverside park.	20,000
C. Remove concrete flood walls in former Surbiton Lagoon site and Raeburn open space.	45,000
D. Liaise with the Royal Borough of Kingston concerning the extension of the riverside park through the area of abandoned allotments planned for redevelopment (UDP Site No. 68). Opportunities for wetland habitat creation.	N/A
E. Coppicing of riverside trees and elm scrub near the stream, within the Raeburn Open Space, to increase light and the development of a more diverse marginal and aquatic flora.	5,000
Total	<u>£ 100,000</u>

LIAISON REQUIRED: The Royal Borough of Kingston, London Ecology Unit, English Nature.

SUMMARY OF COSTS

MAIN RIVER

	£
Figure 7.2 Source of Hogsmill, Ewell	97,000
Figure 7.3 Hogsmill Open Space, Ewell	86,000
Figure 7.4 Tolworth Court and River Hill	37,000
Figure 7.5 Old Malden, Hogsmill and Southwood Open Spaces	43,000
Figure 7.6 Elmbridge Avenue and Rose Walk Open Spaces	190,000
Figure 7.7 Sewage Treatment Works and Kingston Cemetery	30,000
Figure 7.8 Kingston Town Centre	<u>N/A</u>
TOTAL	<u>£ 483,000</u>

TRIBUTARIES

Figure 7.9 Green Lanes Stream	70,000
Figure 7.10 Horton Stream	8,000
Figure 7.11 Bonesgate Stream - Upper Reaches	10,000
Figure 7.12 Bonesgate Stream - Castle Hill	55,000
Figure 7.13 Bonesgate Stream - Tolworth Court Farm	230,000
Figure 7.14 Surbiton Stream	<u>100,000</u>
TOTAL	<u>£ 473,000</u>

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