

A Stepping Stone to Urban Regeneration Highlighting the Opportunities in SOUTH LONDON



Executive Summary

The London Mayor and the Greater London Authority (GLA) have a vision for developing London as an 'exemplary sustainable world city'. This document highlights how and where river restoration can play an integral part in realising that vision.

The Government's Urban White Paper, published in November 2000, the Mayor's forthcoming draft London Plan and the political drivers that support these strategies have brought sustainable urban regeneration to the fore.

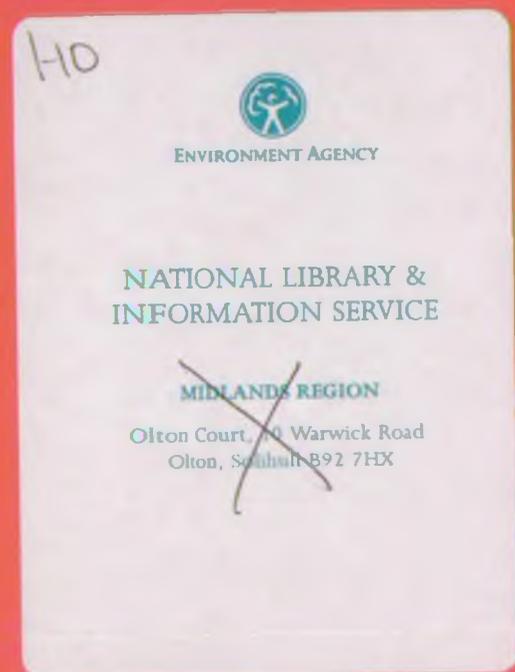
River restoration can play a positive role in urban regeneration and the creation of sustainable urban communities through delivering a wide range of social and environmental benefits for all. These can include:

- attractive, safe and accessible greenspace
- a diversity of natural habitats
- a community focal point promoting improved environmental awareness
- walking and cycling routes for sustainable transport
- improved health and well-being
- an invigorated area to help attract business and investment
- a natural river channel that is connected to its floodplain
- improved biodiversity in the urban environment
- habitats for some of London's key biodiversity species
- improved flood storage capacity that reduces flood risk in the urban environment
- water quality improvements

River restoration will not be possible along the entire length of South London's rivers but this document seeks to highlight the 'areas of immediate opportunity for river restoration'. It also seeks to promote the potential for enhancement of river corridors in areas of regeneration where culverted or channelised rivers pass through proposed development sites. Maps to highlight 'development zones' with potential for river restoration will be produced over the coming months for all the river catchments in London. These maps will help to highlight to local authorities and developers the potential for river restoration in London. The aim being that river restoration will eventually be considered as an integral part of any regeneration or development proposal within the river corridor.

The principles in this document are equally valid for the whole of London. It now just requires the maps to be produced for the other catchments in London, this will be done later in the year.

The Environment Agency and our partners strongly believe that regeneration incorporating river restoration actively promotes a more environmentally sustainable approach to design and planning. This will help to create a more attractive, safe and accessible urban environment that all local people can value and take pride in.



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Mill Lane, Carshalton – before regeneration



Mill Lane, Carshalton – after regeneration

There is a willow grows aslant a brook
 That shows his hoar leaves in the glassy stream;
 There with fantastic garlands did she come,
 Of crow-flowers, nettles, daisies and long purples.

William Shakespeare, Hamlet, IV. vii

Ophelia by Sir John Everett Millais
 ©Tate, London 2002
 The river scene was painted on
 location on the Hogsmill at Ewell
 (1851–1852)



Introduction

*I see what was, and is, and will abide,
Still glides the stream and shall forever glide*

William Wordsworth

Rivers and People

Throughout history, rivers have been a central feature in the development of human societies – the vast majority of our towns and cities are associated with rivers. This relationship has developed because of their social and recreational value to communities as well as for the opportunities they present for practical exploitation and economic development. However, as our societies have become increasingly urbanised the pressures placed on rivers have become ever greater. The development of London around the Thames and its tributaries provides a quintessential example of man's affinity for, and exploitation of, the river.



A forgotten river – channelised for maximum land take



Out of sight, out of mind – the river is no longer treated as a community asset

Trials and Tribulations of Urban Rivers

The increase in the density and extent of urbanisation in Greater London has increased the pressure on our river environment. Rivers are naturally dynamic systems, continually moving and interacting with their floodplain. This has, unfortunately, placed them in direct conflict with the process of urbanisation. Once urban development moved into the floodplain, rivers were heavily modified to allow maximum land take and to provide the subsequent flood protection that these new developments required.

During the 1900s the traditional approach to flood defence and river management was to 'take the river out' of river management and straighten it within concrete channels or culverts. This process, which is akin to putting them in a strait-jacket, results in a uniform and sterile channel of negligible ecological or social value and high long-term maintenance costs. Some rivers such as the Fleet, Tyburn and Effra, have been lost altogether, pushed underground to become part of the city's sewage system.

Increasing urbanisation has resulted in the gradual loss and degradation of natural habitats, such as river corridors and green open spaces, throughout London. Landscape assessment surveys on the rivers of South London have highlighted the legacy left by this type of insensitive river management. The results of the Ravensbourne landscape assessment showed that 63% of the river channel is highly modified, by containment in either a culvert or concrete channel.

The water quality in South London's rivers has improved over the last 10 years, but without accompanying improvements in the habitat quality of the river corridor, the ecological and social value of these rivers will never be realised.

Rivers and their Contribution to Urban Life

In urban areas rivers can provide important natural refuges and corridors between adjacent green spaces, for both people and wildlife. These river corridors are not only critical for maintaining the diversity and abundance of urban wildlife populations, but they also provide a place for people to connect with nature and escape from an urban environment which can otherwise be stark and impersonal. As London's population is expected to rise over the next 15 years the requirement for sufficient quantity of good quality, accessible open space is likely to become an increasingly important issue which can actually be addressed, in part, by river restoration.

Helping our rivers to return, in parts, to nature will provide a real opportunity for city dwellers to re-establish a lost relationship with the natural world and improve the quality of their lives. And nature is not income dependent. Across the board, people from Wimbledon to Lambeth will be able to reap the benefits.



Discovering nature

Rivers and the Opportunity for Restoration and Regeneration

The drive for urban regeneration and renewal is gathering pace and is now well supported by an array of political drivers and funding streams that have been developed by the UK Government and Europe. There now exists a great opportunity for river restoration to capitalise upon this political commitment and financial support for sustainable regeneration.

A sustainable approach to regeneration represents a real opportunity for us to re-discover our relationship with the natural world by 'putting the river back' into river management and, in doing so, make a huge contribution to improving the quality of urban life.

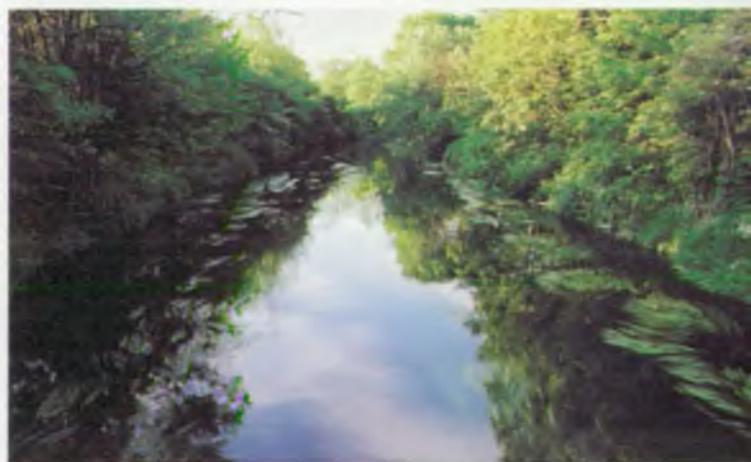
Rivers as a Measure of Sustainable Development

The quality of our urban rivers should be an important yardstick in measuring our progress towards this goal.

This Strategy aims to:

- demonstrate to London boroughs and others the potential for river restoration in South London by identifying 'areas of immediate opportunity for river restoration'
- highlight the environmental, social and economic benefits that can accompany river restoration
- promote the role that river restoration can play in sustainable urban regeneration
- highlight and develop the proposals on river restoration in both the Mayor's Biodiversity Strategy and the expected policy on tributaries of the Thames in the forthcoming draft London Plan or Mayor's Spatial Development Strategy
- encourage and inform those groups who already have an interest in river restoration

Rivers take their course William Shakespeare



Return of the River – Environmental Benefits

The waters running frizzled over gravel
That never vanish and forever travel

Edward Thomas



River restoration schemes have five broad environmental objectives that benefit humans as much as wildlife. By evaluating and measuring each scheme against these objectives it is possible to deliver a range of integrated environmental benefits.

The objectives are sequential and need to be considered together; by achieving one, you contribute to the next.



A restored river corridor

Re-establish Natural Channel Processes within the River Corridor

The creation of a natural river channel, a gravel bed and earth banks, re-establishes the natural hydro-geological relationship between the river and its channel. A process of erosion and deposition gradually creates a natural diversity of instream river habitats, such as riffles and pools, for river life.

Improve the Quality and Role of the River Corridor

Creating a natural channel within the river corridor – the river and its associated greenspace, such as riparian corridor and floodplain – provides a connection between the river and its corridor once again. The corridor plays a very important role in contributing to the abundance and diversity of both aquatic and terrestrial habitats within the river corridor. These habitats provide refuge areas for aquatic life during extreme events, such as high and low flows or pollution incidents. This provides a natural corridor for wildlife movement that links adjacent green spaces in the city and thereby helps to sustain healthy and viable wildlife populations.

Improve Flood Storage Capacity

Re-instating the floodplain provides a natural increase in the flood storage capacity of the site, providing improved flood protection for adjacent properties. The use of the floodplain for storing floodwater reduces the volume and velocity of water in the main channel during peak flows and contributes towards flood protection.



Wetland areas provide improved flood storage

downstream. The reduction in water speed during flood events is also important in ecological terms because it reduces the risk of aquatic and riverside flora and fauna being washed away. The wetlands that may be constructed as part of a restoration scheme can also improve water quality by intercepting run-off and filtering out pollutants before they enter the river.

Improve Biodiversity within the River Corridor

Creating a variety of aquatic and terrestrial habitats within the river corridor is the first part in improving the biodiversity of the site. As the habitats develop and mature, they are gradually colonised by a variety of flora and fauna. The river channel and its aquatic and marginal vegetation



provide habitats for fish and aquatic insect larvae. A high quality riparian corridor with its diverse vegetation provides habitats for riverine animals, such as water voles, dragonflies and kingfishers. Any wetland and pond areas in the floodplain provide additional valuable habitats that will be colonised by different plant and animal species.



improving water quality, there has to be a commitment to deliver the wider benefits available through a programme of river restoration.



Encourage Community Involvement and Improve People's Understanding of the Function and Value of Rivers

Involving local people in developing river restoration projects brings opportunities for public participation in regeneration. This often helps to meet the social needs of the community, by providing improvements to local quality of life through additional greenspace, traffic-free cycleways and footpaths and



Learning about the river



considerable improvements to the visual appearance and accessibility of the local environment. Not only this but it engenders a sense of place, community spirit and pride, values which are increasingly rare in today's urban societies.

Completing the Urban River Renaissance

The water quality in the rivers of London used to be so bad that it was the primary limiting factor to enhancing biodiversity and improving the recreational and aesthetic value of the river corridor. Over the last 10 years, considerable time and money has gone into improving the water quality in these rivers. It has improved so much that the primary limiting factor is now habitat quality and the physical constraints imposed upon rivers. For urban river

corridors to realise their potential for biodiversity, conservation and recreational provision, and to justify the money spent on

Rivers for All – Social Benefits

The social benefits of river restoration for a local community can be numerous and far reaching, but only if local people are actively involved in developing the aims of the project. Urban rivers represent a valuable social and environmental asset that should play a crucial role in the drive for sustainable urban communities.

It is one of the aims of the Mayor's Biodiversity Strategy that all Londoners should be within walking distance of a quality and accessible natural place. River restoration certainly offers London boroughs a chance to create many accessible and quality natural places within London. The catchment maps, in the next section, illustrate where the "areas of immediate opportunity for river restoration" are within South London.

Attractive, Accessible and Safe

*"Squiggly bits are cool." "The area where the river meanders looks attractive." **

The physical improvements to a site provide people with a visually pleasing and easily accessible experience. Developing better and safer access to the site, for groups such as the elderly, disabled and children, helps to open the area up to the socially excluded and more vulnerable groups in a community.



The unique variety of habitats and wildlife associated with a natural river corridor make these environments particularly special for communities in highly urbanised areas who may have few opportunities for regular contact with nature.

Furthermore visually stimulating and accessible sites create the perception of a much cleaner and safer environment. This often contrasts with many people's experience of much of our municipal urban green space which often comprises of an unimaginative and unappealing combination of mown grass and scattered trees.

Peace and Action

*"The children like the meanders, they imagine they are on a desert island." **

A variety of accessible and attractive environments provide local people with a range of recreational and amenity opportunities.

These opportunities include: walking, jogging, cycling, playing, dog walking, picnics, feeding the ducks and connecting with nature.

Such areas are highly valued by children as play areas because they provide new and exciting natural environments, ripe for exploration and adventure. Properly restored river corridors, redesigned with people in mind, can be safer than the concrete drainage channels that frequently pass for rivers in many urban locations.



Health and Happiness

*"It was a channel for conveying water and preventing flooding. Now it is an interesting place to visit." **

The wide range of active and passive recreational opportunities available in the restored area, can have a positive effect on the health and well-being of the local community.

Providing an attractive and safe place to go away from traffic and fumes can encourage people to start exercising more. These areas also provide a natural sanctuary, away from the hustle and bustle of city life, where people can relax, slow down and unwind.

Sustainable Transport

*"Looks more like a river than a canal." **

These new environments can contribute to a borough's sustainable transport plans by providing safe walking and cycling routes to the town centre or between other popular places in the area. In South-East London, the Green Chain initiative works to provide and develop natural corridors between adjacent green spaces.

The River as Teacher

*"You feel you have a bit of countryside in town." **

The improved natural environment and its wildlife can provide valuable opportunities for formal and informal learning, helping develop people's appreciation of their local environment and raising their awareness of environmental issues. It can also help to lessen the cultural gap between town and country.

On-site interpretation can provide information about the new site and the habitats and wildlife that can now be found there.

Local schools can run field trips for students to learn about their local river and its associated pond and wetland environments.



Connecting People and the Community

*"You see more people walking on a spring evening. The river is more open and you can see more. The wildlife has attracted people." **

As more people use the site, it starts to be seen as a safe place to visit and this will encourage others. As this happens it begins to provide a focal point for local people and helps to promote a sense of community.

If people develop appreciation for their river environment they will begin to protect and care for it.

The creation of a more attractive river environment as part of an overall regeneration programme can help local economic development by attracting businesses into a new and invigorated area. There is an increasing demand for quality riverside

developments in both the commercial and domestic sectors; the incorporation of river restoration within such developments provides an attractive and distinctive urban environment. Sustainable riverside development has become an integral part of many urban regeneration schemes throughout the country.

** quotes from from public responses to River Skerne restoration project in Darlington:- Tapsell S.M., Tunstall S.M. and Eden S. (1999) How stable are public responses to changing local environments? A 'before' and 'after' case study of river restoration, Journal of Environmental Planning and Management, 42(4), pp.527-547.*





Geographic Coverage

This document looks at the potential for river restoration on four river catchments in South London – the Ravensbourne, Wandle, Beverley Brook and Hogsmill (see map), similar maps conveying the same information on the other rivers in London will be produced in the near future. This will not include the 'lost rivers' of London e.g. Effra. The area covered, at present, extends along the River Thames from Kingston-upon-Thames to Greenwich in the North, to the North Downs and the towns of Caterham and Warlingham in the South and from Epsom in the West to Bromley in the East.

Each of these rivers have their source at or near the spring line of the North Downs, which is where the porous chalk of the North Downs meets the impervious London Clay. This spring line runs West to East across South London through Epsom, Sutton, Croydon and Orpington. From each of their sources these rivers then flow in a northerly direction towards their respective confluences with the River Thames. The Ravensbourne flows into the Thames at Deptford, the Wandle at Wandsworth, the Beverley Brook at Barn Elms, near Putney, and the Hogsmill at Kingston-upon-Thames.

As mentioned, the principles in this document are equally valid for the whole of London and maps will be created, in the near future, for each of the other catchments in London to highlight the 'river channel types', 'areas of immediate opportunity for river restoration' and 'zones of development'.



A typical channelised river running through a park



A restored section of river in Wandle Park, Colliers Wood

Maps to Illustrate 'River Channel Types' and 'Areas of Immediate Opportunity for River Restoration'

This section contains two maps for each river catchment. The first highlights the existing river channel types, categorised by landscape assessment surveys, and the second highlights where the 'areas of deficiency for nature conservation' and 'areas of immediate opportunity for river restoration' are in each catchment. It is hoped that local authorities and developers will use these maps to assess where development proposals are in relation to the river corridor so that during development and regeneration the opportunity for river restoration is not overlooked.

Channel Type Definitions

Culverted Rivers

The river flows underground within either a brick or concrete chamber



Artificial Channel

Either the banks and/or bed of the river comprise of a man made material



Toe-boarded Channel

Wooden planks have been attached to the base of the riverbank



Semi-natural (straightened)

The bed and banks comprise of natural material, but the river has been straightened



Semi-natural (meandering)

The bed and banks comprise of natural material, and the course of the river has not been changed



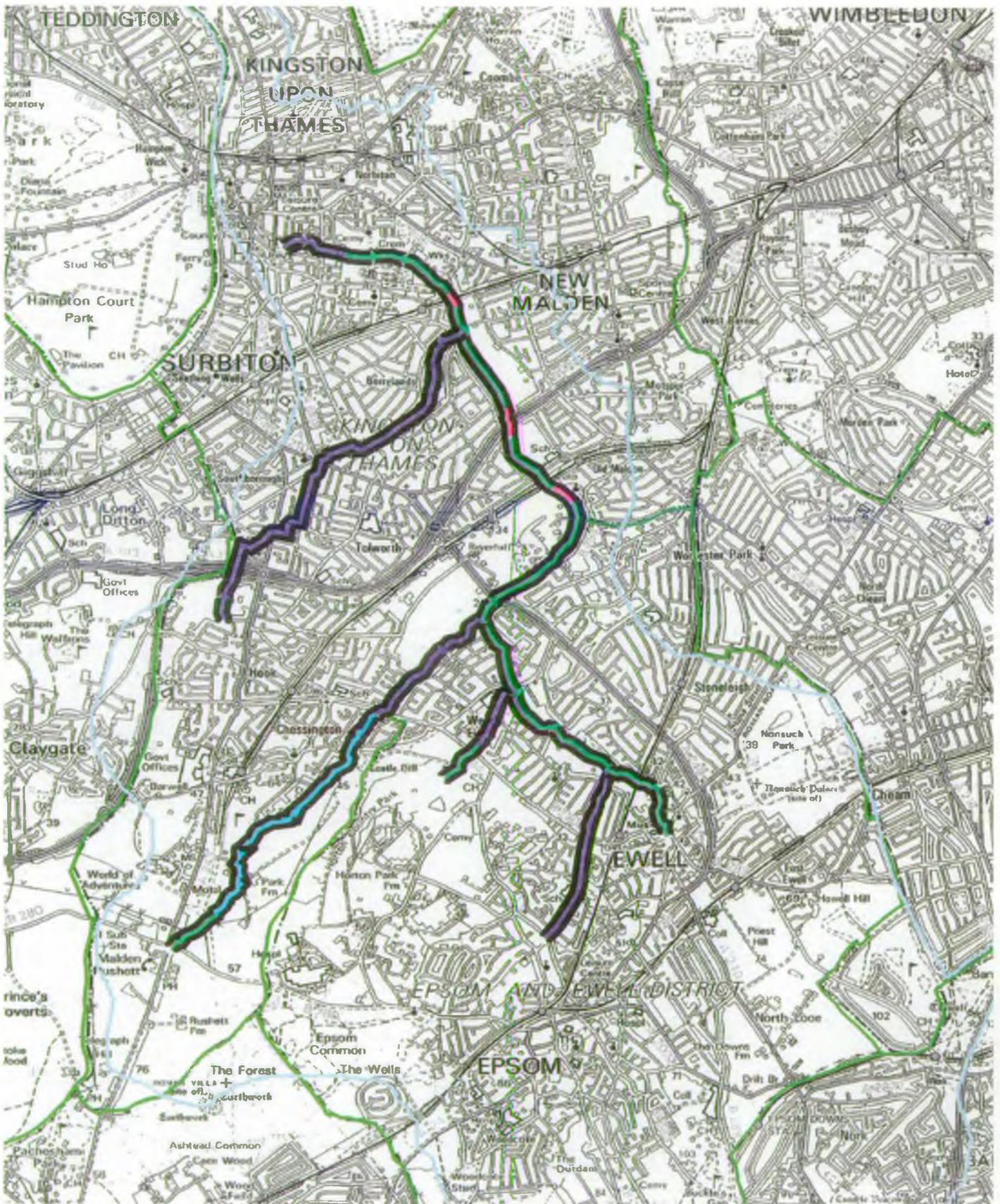
Areas of Deficiency for Nature Conservation

Areas more than 1 km from accessible wildlife sites that qualify as Sites of Borough Importance for Nature Conservation as shown in the Handbooks on Nature Conservation in the boroughs of Kingston-upon Thames, Sutton, Merton, Lewisham, and Greenwich published by the former London Ecology Unit between 1993 and 2000, plus surveys of the London Borough of Wandsworth in 1992 and London Borough of Bromley in 2000.

Areas of Immediate Opportunity for River Restoration

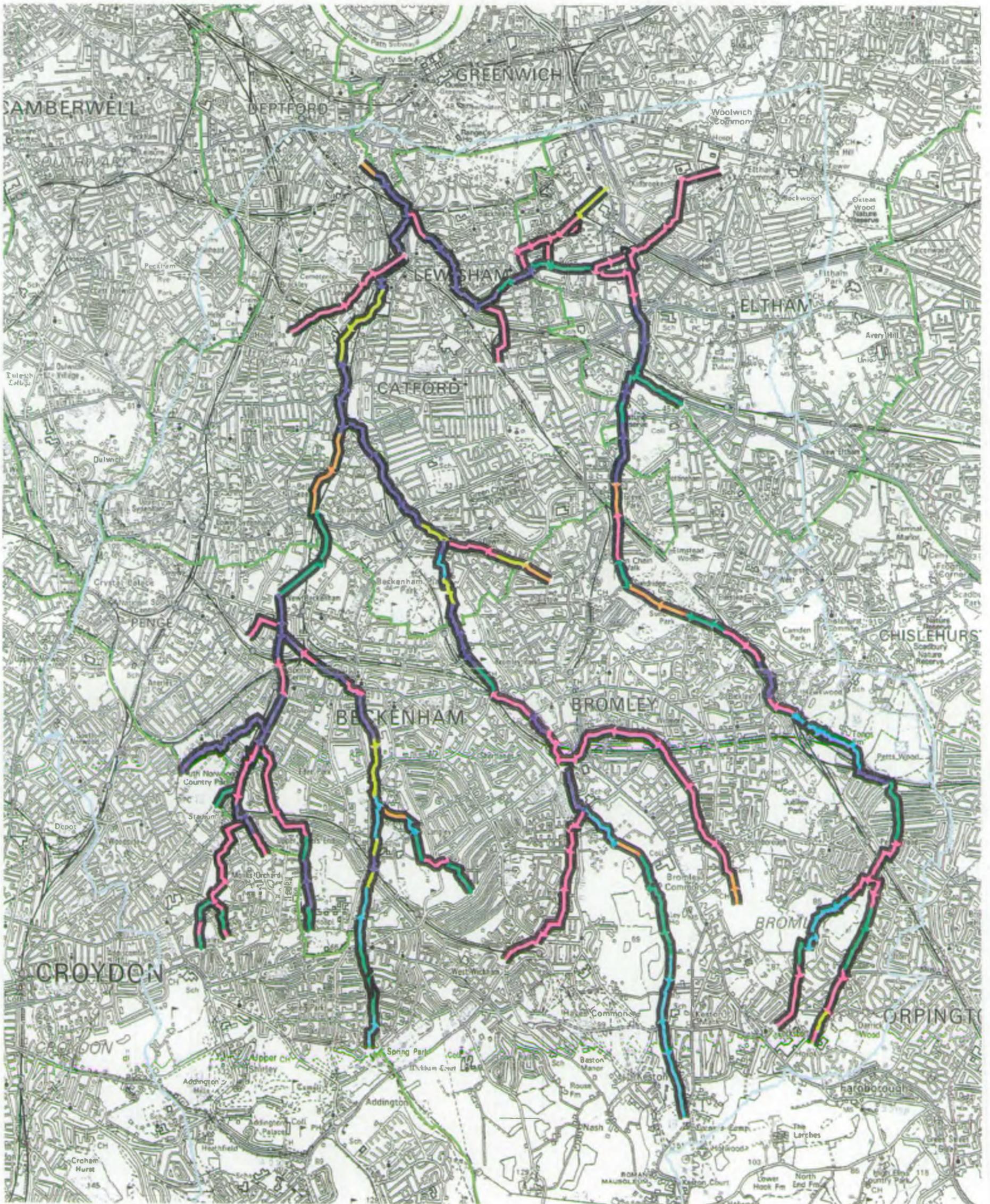
Modified channels within open space and in the public realm.

River Channel Types in the Hogsmill Catchment



River channel types (based on 1993 survey)

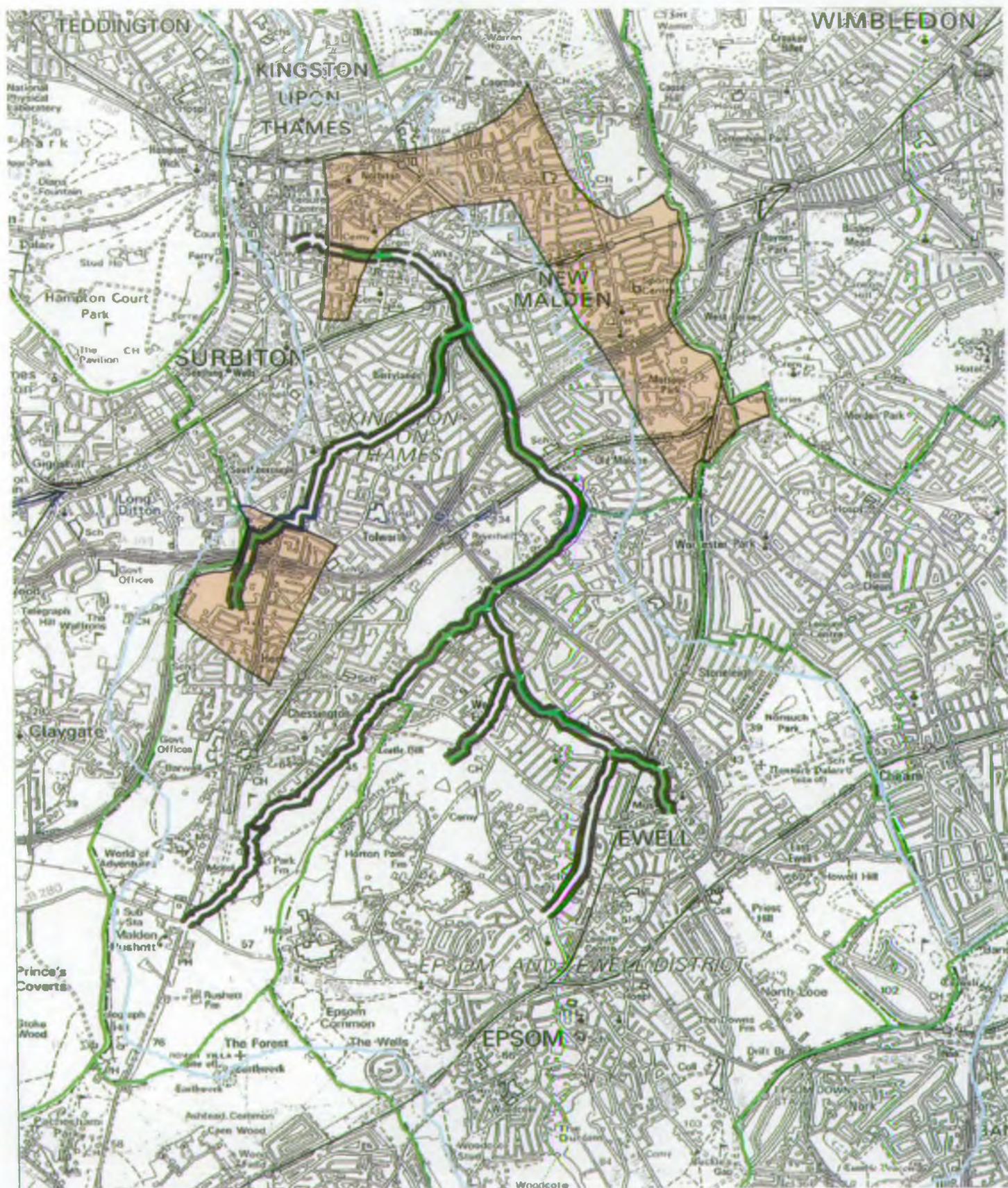
Culverted channel		Artificial channel		Toe-boarded channel		Semi-natural (straightened)	
Semi-natural (meandering)		Restored/semi-restored		Catchment boundary		Borough boundary	



River channel types (based on 1998 survey)

- | | | | | | | | |
|---------------------------|--|------------------------|--|---------------------|--|-----------------------------|--|
| Culverted channel | | Artificial channel | | Toe-boarded channel | | Semi-natural (straightened) | |
| Semi-natural (meandering) | | Restored/semi-restored | | Catchment boundary | | Borough boundary | |

'Areas of Deficiency for Nature Conservation' and 'Areas of Immediate Opportunity for River Restoration' in the Hogsmill Catchment



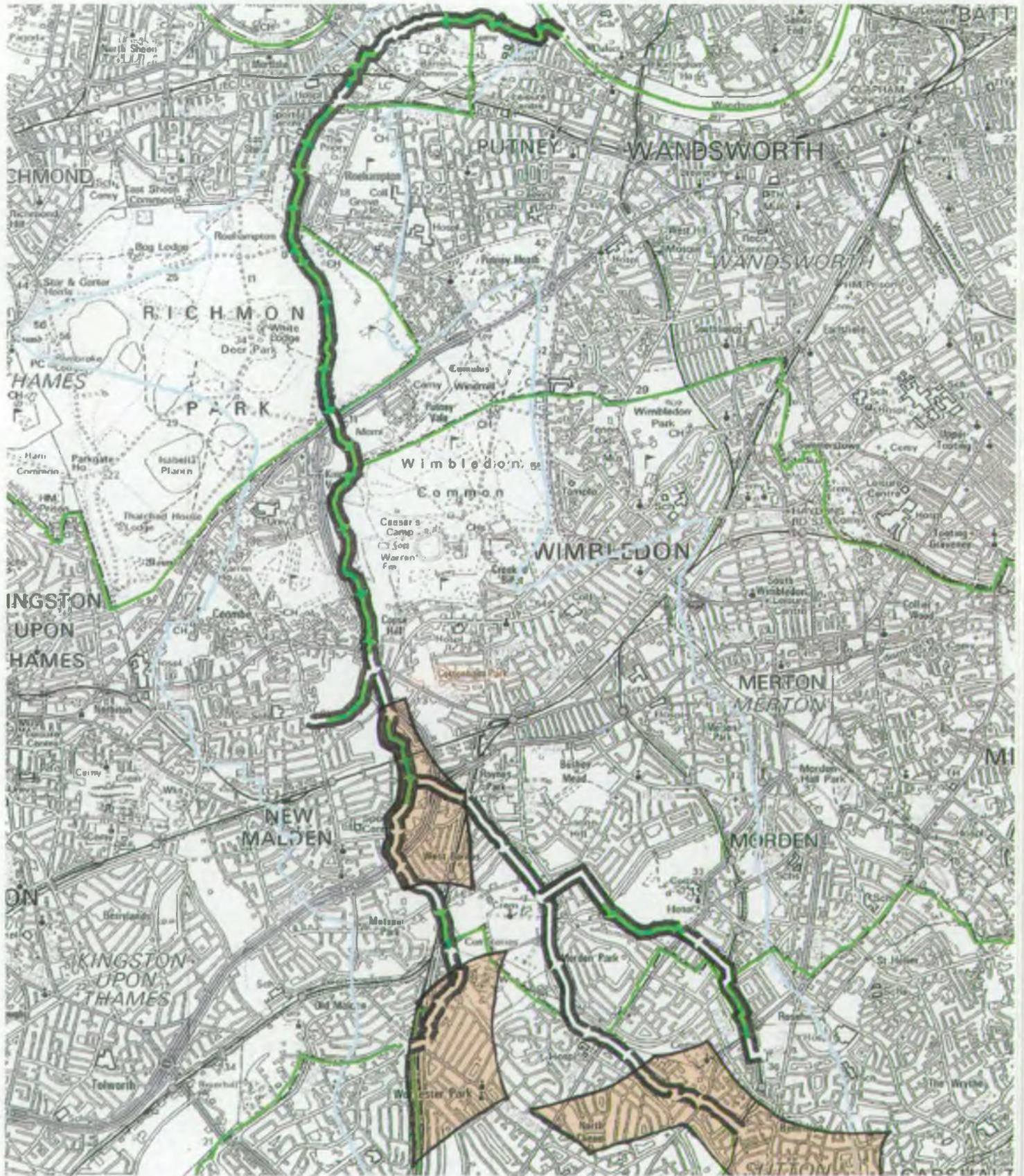
River Channel Types in the Beverley Brook Catchment



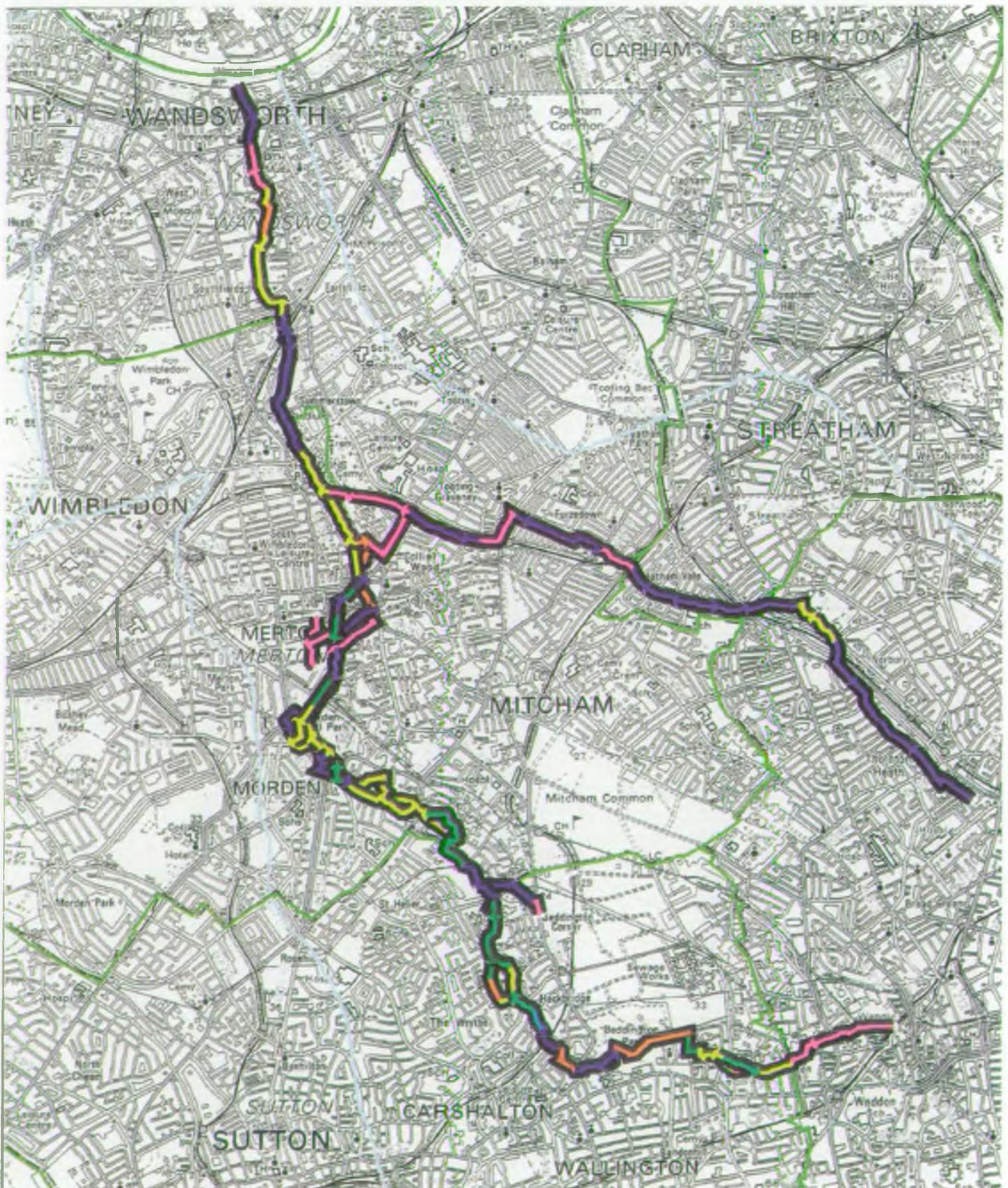
River channel types (based on 1998 survey)

Culverted channel		Artificial channel		Toe-boarded channel		Semi-natural (straightened)	
Semi-natural (meandering)		Restored/semi-restored		Catchment boundary		Borough boundary	

'Areas of Deficiency for Nature Conservation' and 'Areas of Immediate Opportunity for River Restoration' in the Beverley Brook Catchment



River Channel Types in the Wandle Catchment



River channel types (based on 1998 survey)

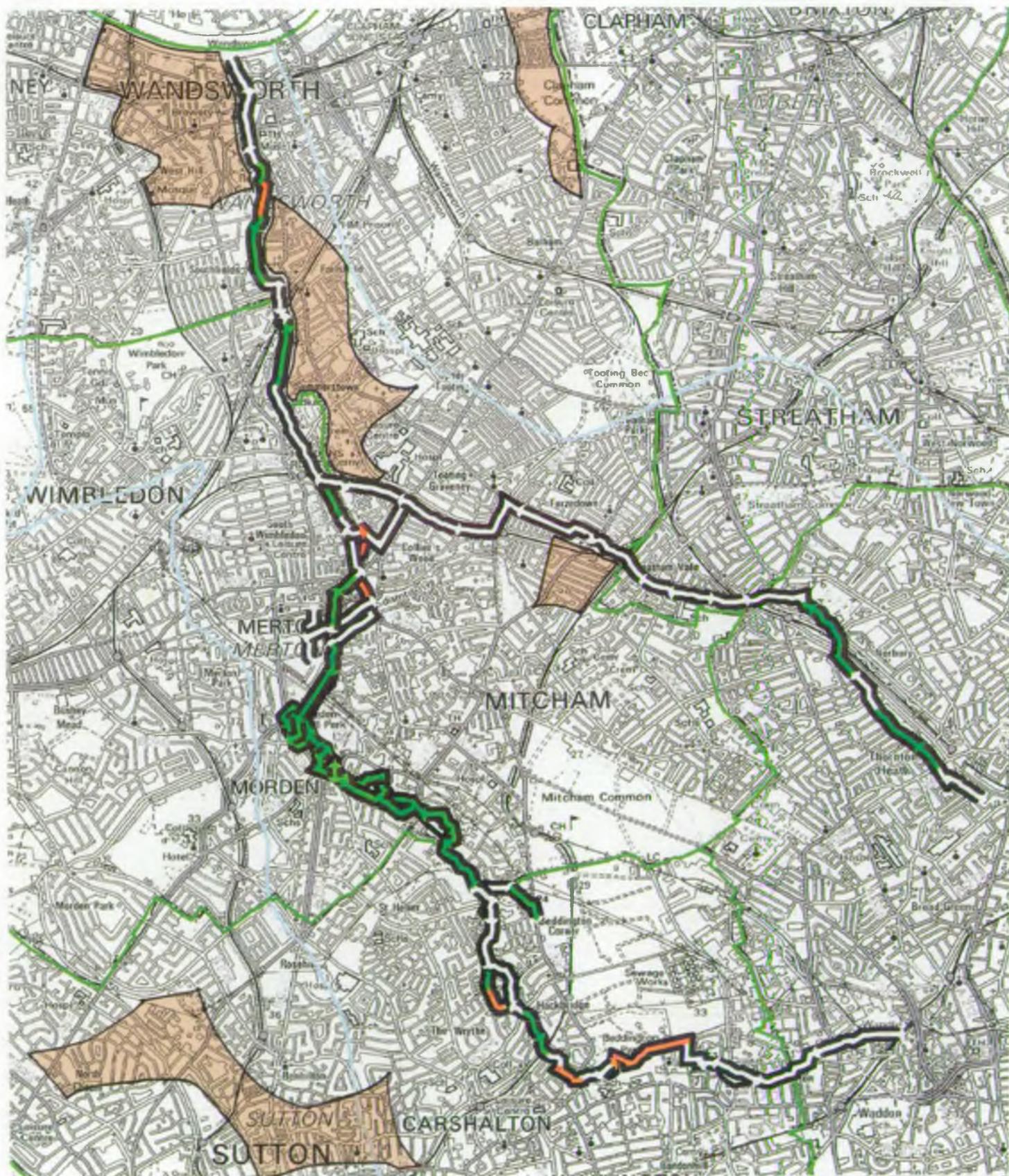
Culverted channel		Artificial channel		Toe-boarded channel		Semi-natural (straightened)	
Semi-natural (meandering)		Restored/semi-restored		Catchment boundary		Borough boundary	

'Areas of Deficiency for Nature Conservation' and 'Areas of Immediate Opportunity for River Restoration' in the Ravensbourne Catchment



Areas of deficiency for nature conservation		Areas of immediate opportunity for river restoration	
Restored/semi-restored channel		Catchment boundary	
		Borough boundary	

'Areas of Deficiency for Nature Conservation' and 'Areas of Immediate Opportunity for River Restoration' in the Wandle Catchment



Areas of deficiency for nature conservation Areas of immediate opportunity for river restoration
 Restored/semi-restored channel Catchment boundary Borough boundary

How River Restoration is Done

Through the work of the Environment Agency, river restoration has and continues to be achieved through capitalising on opportunities offered by regeneration and redevelopment, when improving or updating flood defences and by effective partnership working. This necessitates effective partnership working with local authorities, landowners, the local community and statutory bodies.

Partnership development and public consultation is very important for successful river restoration in the public realm because there are so many different interest groups involved (for recent examples of good practice read the case studies at the end of this document).

Feather-footed through the plashy fen passes the questing vole

Evelyn Waugh (Scoop)

Planning and River Restoration

The land-use planning process provides great opportunities for incorporating river restoration within a proposed development. Planning agreements or planning conditions can help deliver river restoration schemes. Developers can be made aware of such opportunities at the pre-planning stage by inclusion of a river restoration policy, highlighting 'areas of immediate opportunity for river restoration' and areas of opportunity in 'development zones', within each local authority's Unitary Development Plan.

Consents and Permissions

There are a number of legal consents and permissions required from various bodies before being able to undertake a river restoration project. These may include the landowner, the Environment Agency, the Local Authority and English Nature. For further information contact the Environment Agency or your local authority.



Habitat improvements within the confines of the existing channel



The Wandle, at Wallington Road Bridge

Making River Restoration Happen

There are a variety of political drivers, or mechanisms, designed to support the implementation of Government policy and E.U. legislation, such as the Government's Urban White Paper and the E.U. Habitats Directive. These drivers ensure the availability of considerable financial resources to support appropriate initiatives that will deliver their primary objectives and directly improve the 'quality of life' for local communities and secure sustainable environmental improvements.

Regeneration in London

In London, at present, the key political drivers are aimed at achieving sustainable regeneration and growth; and, in particular, improving people's quality of life by



A restored river

transforming the local environment and infrastructure in deprived urban areas and then helping local people to access these new opportunities.

These objectives are encapsulated by the Mayoral strategies on economic

development, transport, waste, energy, biodiversity, culture, and air quality. The London Plan, the Mayor's Spatial Development Strategy, will establish the land use planning policies for London for the next 20 years. This is complimented by its Blue Ribbon Network Annex, which will help address spatial development issues with respect to the network of waterways across London.

The most important strategies for driving river restoration will be the London Plan, especially its annex the Blue Ribbon Network, and the Mayor's Biodiversity Strategy. This document aims to identify opportunities for urban regeneration projects in London to restore river corridors in line with the strategic approach to river restoration that is already identified in the Mayor's Biodiversity Strategy and expected within the draft London Plan and its Blue Ribbon Network Annex.



A restored river

Environmental Drivers

There are also more direct legislative drivers for environmental improvements, such as the Water Framework Directive (2000/60/EC) and Habitats Directive (92/43/EEC).

Amongst other requirements the Habitats Directive requires the management of "features of the landscape which are of major importance for wild flora and fauna". These features include those which provide corridors and stepping stones which aid migration, dispersal and genetic exchange. Particular mention is made of rivers and ponds in this context. This element of the Habitats Directive is reaffirmed in Regulation 37 of the Conservation (Natural Habitats, &c) Regulations 1994 and para. 16 of Planning Policy Guidance: Nature Conservation (PPG9, 1994).

The Water Framework Directive introduces an integrated and co-ordinated approach to water management through development of river basin management plans. The environmental objectives of the Directive are to achieve "good surface water status", "good groundwater status" and also to prevent deterioration in the status of those waters that are already good. Ecological status will now be used as the key indicator of quality in surface waters. There are five categories: rivers, lakes, estuaries, coastal waters and heavily modified water bodies (e.g. urbanised rivers). The inclusion of heavily modified water bodies, as a separate group, gives recognition to the fact that habitat is often the limiting factor to these water bodies achieving good ecological status. This will hopefully act as a major driver for river restoration where the opportunity exists and there are no overriding social or economic reasons for not doing so.

Both these directives can be delivered in urban areas by the implementation of integrated river restoration schemes.

New Funding Opportunities

The new political and environmental drivers, some of which are listed above, are supported by significant new funding opportunities. However, the majority of these funding streams aim to support cross-cutting, integrated initiatives. River restoration schemes are well-placed to exploit these funds because of their ability to deliver a wide array of social, environmental and economic benefits.

External Funding Streams

There seems to be an ever-increasing array of funding opportunities that are now available to support the various political drivers developed by the UK Government and Europe. Funding streams are available for environmental projects but there are many more for social and regeneration projects as this reflects the increasing number of political drivers being developed to promote sustainable development.

The key to accessing a wide range of funding opportunities is in placing appropriate emphasis on the objectives of the project that match the funding stream's criteria. So to access the numerous funding streams that support sustainable development and urban regeneration it is critical to illustrate clearly the social and, where appropriate, economic benefits of river restoration as well as its environmental benefits.

There are 3 main sources of funding: National Lottery, UK Government Funds and European Funds. This section will only give an initial insight into the possibilities offered by these various funding streams and for further information please go to the internet sites provided.

National Lottery Funding

The three funds appropriate for river restoration are:

Heritage Lottery Fund: aims to safeguard, enhance and give wider public access to and understanding of natural habitats and the countryside, urban green spaces, archaeology, historic buildings, museums, libraries etc.

For further information go to www.hlf.org.uk

New Opportunities Fund: funds health, education and environment projects. The most appropriate initiative is the

'Green Spaces and Sustainable Communities' programme. For further information go to www.nof.org.uk

The Community Fund: is an independent organisation set up to distribute financial support to charities, voluntary and community groups. Its aim is to improve the physical or social environment of disadvantaged or low in-come communities. For further information go to www.nlcb.org.uk





UK Government Funding

The grants that may be appropriate for river restoration in this section originate from various Central Government departments, but some of the funds may be administered by or through agencies. The primary focus of these funds in London is to support the political drivers for sustainable urban regeneration and renewal, examples of such grants are Neighbourhood Renewal and the Landfill Tax Credit Scheme.

For further information go to:

www.info4local.gov.uk/subjects.asp

www.hmce.gov.uk/business/othertaxes/landfill-tax.htm

www.hmce.gov.uk/forms/notices/lft1.htm

www.regeneration.dtlr.gov.uk/index.htm

European Funding

There is potential among some of the European Community Funding programmes for projects which demonstrate good practice and innovative thinking in the environment, and it is possible that some River Restoration projects could be supported in this way. The process of developing an application is complex and time consuming, and a first step may be liaison with funding specialists in Local Authorities or the Government Office for London.

The three most appropriate funds are:

Interreg – is one of the programmes of the European Regional Development Fund, and is aimed at promoting and integrating regional development amongst member states. Projects must be carried out in association with one or more partners from another member state in north-west Europe and must have trans-national goals.

Fifth Framework – this supports research and technological development. The following themes may be appropriate for river restoration: quality of life and management of living resources; competitive and sustainable growth; energy, environment and sustainable development.

LIFE - this fund is designed to support the development and implementation of community environmental policy and there are 2 LIFE programmes that are relevant to river restoration in the UK

- **LIFE-Environment** - promotes sustainable development in land use and industrial activities
- **LIFE-Nature** - protects endangered species and habitats, especially if protected by legislation or of community importance

For more information go to www.europa.eu.int or any Government Office web site

e.g. www.dti.gov.uk/europe/structural.html



Rivers can create a focal point at a site

1. The Ravensbourne at Brookmill Park

Location Lewisham, South East London
Rivers / Catchment River Ravensbourne / Ravensbourne catchment
London Borough Lewisham
Developer DLR Ltd, CGL Rail and LRG Contractors
Date Started / Completed Completed - 1998
Types of Enhancement Improving Quality of Life
River Restoration Sustainable Flood Defences
Delivering Biodiversity Development Type
Light railway system Contact details
Customer Services Environment Agency
South East Area Office 10 Albert Embankment, London, SE1 7SP.

Site History

The Ravensbourne, at Brookmill Park, downstream of Lewisham used to flow through a concrete flood channel and provided negligible environmental or social value. The extension of the Docklands Light Railway (DLR) to Lewisham provided the perfect opportunity to restore this section of river. This is because the flood channel actually provided the most direct route for the DLR to Lewisham and using it would have minimal environmental and visual impact on the park and surrounding area. The Ravensbourne could then be diverted into a new natural channel in the park to create a quality river environment for both wildlife and people to enjoy. This scheme was financed by DLR Ltd., CGL Rail and LRG Contractors as part of the planning conditions for the DLR extension.

Description of Scheme

The river was diverted into a new 300 metre meandering 3-stage channel that provides a natural gravel bed, sloping river terraces with native landscaping, wildlife features and increased flood storage capacity. A waterproof membrane was laid along the river diversion, at least 1 metre below the new river bed, to protect the chalk aquifer below. An existing ornamental lake on the site was redesigned to create a more natural lake and a variety of still water habitats.



The 1st stage is a low flow channel cut specifically within the main channel to convey river water during low flows to protect aquatic life. The 2nd stage is the main channel of the river that conveys normal flows. The 3rd stage is a flood meadow with grassed banks designed to accommodate flood flows of up to a 1 in 100 years flood.



Environmental Benefits

- creation of sustainable in-stream, marginal, wetland and floodplain habitats
- increased biodiversity through natural colonisation and native landscaping
- increased flood storage capacity
- creation of a natural river corridor for animal movement

Social Benefits

- attractive, accessible and safe river environment near to Lewisham town centre
- a natural river environment removed from its surrounding urban environment
- a place to play or relax
- a local river for school children to study river life



2. The Wandle at Wandle Park, Colliers Wood



Location Wandle Park, Colliers Wood, South London
Rivers / Catchment River Wandle / Wandle catchment
London Borough Merton
Developer London Borough of Merton, Groundwork Merton and Environment Agency
Date Started / Completed 1999 / 2000
Type of Enhancement Sustainable Urban Drainage
Restoring Landed Improving Quality of Life
River Restoration Sustainable Flood Defences
Length of Enhancement 500 metres
Development Type Environmental Improvement
Contact details Environmental Improvements Team – Flood Defence, Environment Agency, South East Area Office, Swift House, Frimley Business Park, Frimley, Camberley, Surrey, GU16 5SQ

Site History

The old concrete channel or loop running through Wandle Park, Colliers Wood, was one of many dis-used mill leats that still exist in the Wandle catchment, a remnant of its rich industrial past. The channel had become neglected, the water was polluted and generally it was



detracting from the overall social and environmental value of the park. The restoration took 4 years from design to completion and was a partnership between the Environment Agency, London Borough of Merton and Groundwork Merton. The project cost about £900,000 and utilised money from the European Life Fund, Single Regeneration Budget, Landfill Tax Credits, commercial sponsorship and matched funding.

Scheme Description

After public consultation, which included a planning for real exercise, the four main objectives of the scheme were agreed: improve the water quality in the park; improve the visual appearance of the channel; increase the variety of natural habitats and improve the bridges and paths. The scheme started in 1999 and was completed in 2000. In the first phase, summer 1999, a new river channel, reed bed and footpaths were created. The second phase, in 2000, involved landscaping the site, installation of children's playground equipment and creating additional footpaths. The site also contained an area of contaminated land, this was treated on site by storing it within a purpose built containment cell that was then landscaped within the scheme.



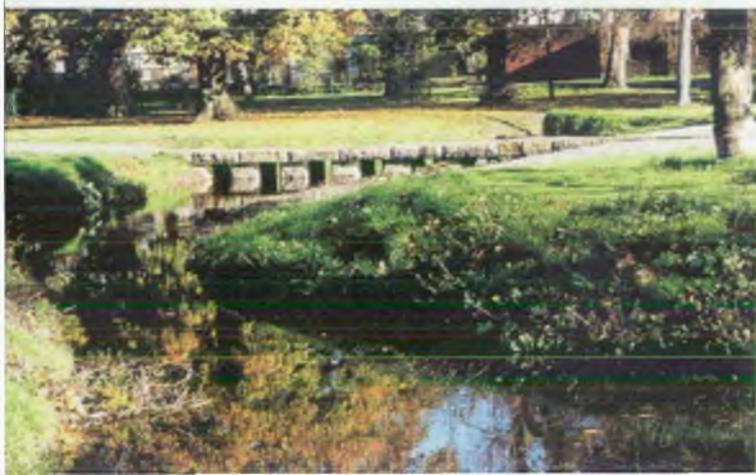
Overview of enhancements

Environmental Benefits

- creation of sustainable in-stream, marginal, wetland and floodplain habitats
- increased biodiversity as a result of colonisation by natural flora and fauna and native landscaping
- reed beds provide some treatment for discharges from urban surface water drains and this helps to improve the water quality in the new channel
- treatment of contaminated land

Social Benefits

- improved natural environment just off Colliers Wood High Street
- improved visual appearance and social value to the community
- better access into and through the park through creation of footpaths
- a variety of play areas for children, including gravel beach areas and the playground



3. The Ravensbourne at Norman Park

Location Norman Park, Bromley, South East London
 Rivers / Catchment River Ravensbourne, Ravensbourne catchment
 London Borough Bromley
 Developer Environment Agency and London Borough of Bromley
 Date Started / Completed Types of Enhancement
 Improving Quality of Life, River Restoration
 Sustainable Flood Defences
 Delivering Biodiversity
 Length of Enhancement 600 metres
 Length of Enhancement Environmental Improvement
 Contact details Environmental Improvement Agency, South East Area Office, Swift House, Frimley Business Park, Frimley, Surrey GU16 7SQ



Site History

Norman Park is a large public open space in the Ravensbourne catchment within the London Borough of Bromley. As part of an

historic flood defence scheme for the area the river was diverted into a concrete culvert, 1 metre wide and 330 metres long, that ran the entire length of the park buried underground before finally re-emerging at ground level in a field downstream of the park. This turned the park into one large, uniform recreation park with little visual or habitat diversity. The park was consequently deprived of all the social and environmental benefits that a river can provide for a local area and its people. This river restoration scheme was a partnership between the Environment Agency and London Borough of Bromley.



Environmental Benefits

- creation of a **natural** channel in place of a buried culvert
- creation of **sustainable** instream, marginal, wetland and floodplain **habitats**
- potential for **improved** biodiversity in the area
- increased **flood storage** capacity
- re-connected **the 2** stretches of semi-natural channel up and downstream of the park



Scheme Description

The scheme was started in February 2000 and completed in May 2000. A new natural channel was excavated within the park, to create the variety of natural habitats usually found in a river corridor, and the river was then diverted into its new channel. Part of the scheme was landscaped with native vegetation and the rest of the scheme will be colonised naturally. There are two bridges allowing people to cross the river and the gently sloping banks give safe and easy access to the water's edge along most of its length.

Social Benefits

- creation of a **more** attractive, diverse and accessible public open **space**
- a public open **space** that now provides opportunities and interest for a **larger** number of people within the local community
- increased **access** and interest has meant local people have begun to see **the** park as a focal point
- a river for local **schools** and the community to visit, learn from and enjoy

4. Spring Brook at Shaftesbury Park



Location
Shaftesbury Park, Downham,
South East London
Rivers / Catchment
Spring Brook, Ravensbourne
catchment
London Borough
Bromley
Developer

Environment Agency and London
Borough of Bromley
Date Started / Completed
Completed - May 2000
Types of Enhancement

Improving Quality of Life
River Restoration
Sustainable Flood Defences
Delivering Biodiversity
Length of Enhancement
130 metres
Development Type: Environmental
Improvement
Contact details

Environmental
- flood Defence, Environment
Agency, South East Area Office,
Swift House, Frimley Business Park,
Frimley, Surrey GU16 7SQ



Site History

Spring Brook, a tributary of the Ravensbourne, runs through Shaftesbury Park in Downham and is part of the London Borough of

Bromley. The river was confined within a concrete channel as part of an historic flood alleviation scheme. This resulted in the river contributing virtually nothing to the ecological or social value of the area. This river restoration scheme was a partnership between the Environment Agency and London Borough of Bromley

Scheme Description

The scheme began in March 1999 and was completed in May 2000. It required the excavation of a new natural channel, 130 metres long, and the subsequent removal of the old concrete channel. The river restoration included the construction of two gravel beaches to allow safe and easy access to the river, a path along its length and a blockstone bridge for safe crossing. A pond was also created next to the river to provide a variety of still water habitats to attract different animals and plants.



Environmental Benefits

- creation of sustainable instream, marginal, wetland and floodplain habitats
- creation of a pond and the additional still water habitats it provides
- increased contribution to biodiversity in the area, especially wetland species such as watercress, water-forget-me-not, dragonflies and damselflies
- increased flood storage capacity
- a natural river to help improve local people's environmental awareness

Social Benefits

- a more attractive, accessible and safe environment
- an environment that provides a greater variety of interests and stimulation for local people
- a place for local children to play safely
- a local school is developing the site as a local educational resource to study river systems and their ecology



Endorsements

Ken Livingstone, Mayor of London

"I wholeheartedly welcome this document which is an important stepping stone towards my vision of London as a sustainable World City. River Restoration helps people to connect with natural processes, as well as enhancing the local environment and providing habitat for aquatic creatures. I wish the strategy every success and look forward to seeing many exciting projects stem from this initiative, and to seeing the process extended to all of London's tributary rivers in due course."

English Nature

"The tributaries of the Thames infiltrate London's urban environment providing wildlife corridors from suburbia to the city centre. River restoration – restoring existing river corridors and recreating lost links – can significantly enhance their nature conservation value and that of adjacent greenspaces. English Nature welcomes this document and hopes it helps gain acceptance for a sustainable approach to the management of river corridors within urban regeneration schemes in London."

Acknowledgements

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<p>TURKISH</p> <p>Eğer İngilizce ana diliniz değilse ve tercümeye ihtiya_ciniz varsa lütfen bize telefon edin, size tercüme eden birini bulabiliriz.</p>	<p>URDU</p> <p>اگر انگریزی آپ کی مادری زبان نہیں ہے اور آپ کو ترجمہ کی ضرورت ہے تو براہ مہربانی ٹیلیفون کریں، ہم آپ کے ترجمہ کا انتظام کریں گے۔</p>	<p>VIETNAMESE</p> <p>Nếu qui vì không thạo tiếng Anh và cần bản dịch, chúng tôi có thể giúp qui vì lấy một bản.</p>

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