

## HA16 Rivers and Streams

### Definition

All free-flowing watercourses above the tidal limit

### London's rivers and streams resource

The total length of watercourses (not including those with a tidal influence) are provided in table 1a and 1b. These figures are based on catchment areas and do not include all watercourses or small watercourses such as drainage ditches.

**Table 1a: Catchment area and length of fresh water rivers and streams in SE London**

Watercourse name	Length (km)	Catchment area (km <sup>2</sup> )
<b>Hogsmill</b>	<b>9.9</b>	<b>73</b>
Surbiton stream	6.0	
Bonesgate stream	5.0	
Horton stream	5.3	
Greens lane stream	1.8	
Ewel court stream	2.7	
Hogsmill stream	0.5	
<b>Beverley Brook</b>	<b>14.3</b>	<b>64</b>
Kingsmere stream	3.1	
Penponds overflow	1.3	
Queensmere stream	2.4	
Keswick avenue ditch	1.2	
Cannizaro park stream	1.7	
Coombe Brook	1	
Pyl Brook	5.3	
East Pyl Brook	3.9	
old pyl ditch	0.7	
Merton ditch culvert	4.3	
Grand drive ditch	0.5	
<b>Wandle</b>	<b>26.7</b>	<b>202</b>
Wimbledon park stream	1.6	
Railway ditch	1.1	
Summerstown ditch	2.2	
Graveney/ Norbury brook	9.5	
Figgs marsh ditch	3.6	
Bunces ditch	1.2	
Pickle ditch	0.9	
Morden Hall loop	2.5	
Beddington corner branch	0.7	
Beddington effluent ditch	1.6	
Oily ditch	3.9	
Cemetery ditch	2.8	

Therapia ditch	0.9	
Micham road new culvert	2.1	
Station farm ditch	0.7	
<b>Ravenbourne</b>	<b>17.4</b>	<b>180</b>
Quaggy (kyd Brook)	5.6	
Quaggy hither green	1	
Grove park ditch	0.5	
Milk street ditch	0.3	
Ravensbourne honor oak	1.9	
Pool river	5.1	
Chaffinch Brook	4.4	
Spring Brook	1.6	
The Beck	7.8	
St James stream	2.8	
Nursery stream	3.3	
Konstamm ditch	0.4	
<b>River Cray</b>	<b>12.6</b>	<b>45</b>
River Shuttle	6.4	
Wincham Stream	5.6	
<b>Marsh Dykes (combined)</b>	<b>17.8</b>	<b>37</b>
Upper Bedon Stream	2.3	

**Table 1b: Catchment area and length of main fresh water rivers and streams in SE London**

<b>Watercourse name</b>	<b>Length (km)</b>	<b>Catchment area (km<sup>2</sup>)</b>
<b>Roding</b>	<b>22.5</b>	<b>342 (whole)</b>
Brookhouse Brook	4.7	
Ingrebourne	43.3	
Rainham Creek	1.7	
Carters Brook	1.21	
Paines Brook	2.2	
Weald Brook	4.3	
Aveley Sewer	1.0	
Ferry Lane Sewer	1.8	
Havering New Sewer	1.2	
Ingrebourne Branch	0.4	
Low Level Sewer	1.1	
Pooles Sewer	1.9	
Rainham Cross & Main Sewer	2.5	
Reed Bed Sewer	0.7	
Southall Sewer	2.1	
Wennington Branch Sewer (N, W & E)	3.9	
Wennington Main Sewer	2.4	
Beam	6.3	
Dagenham Branch	1.0	
River Rom	3.2	

Wantz Stream	1.2	
Loxford Water (Seven Kings Water)	11.7	
Hog Hill Ditch	2.3	
<b>Lee</b>	<b>33</b>	<b>1420 (whole)</b>
Lee Navigation	22.9	
Pymmes Brook	15.6	
Salmon Brook	13.2	
Turkey Brook	13.3	
<b>Brent</b>	<b>17.9</b>	<b>151</b>
Folly Brook	4.4	
<b>Crane</b>	<b>13.6</b>	<b>110</b>
Dollis Brook	1.8	
Silk Stream	5.3	
Duke's River	13.6	
Yeading Brook	25.8	
<b>Colne</b>	<b>18</b>	<b>1016 (whole)</b>
Potters Bar Brook	3.3	
Mimmshall Brook	9.8	
Frays	9.0	
Colne Brook	15	
Wraysbury	4.7	
Pinn	19.9	

**Hogsmill** - The source of the Hogsmill is a chalk spring at Ewell in Surrey. Its main tributary is Bonesgate Stream which rises near Malden Rushett to the south of Chessington and flows into the Hogsmill upstream of Tolworth Court Bridge. The Hogsmill River joins the River Thames close to the centre of Kingston-upon-Thames.

**Beverley Brook** - This rises from the Southern edge of the London Clay basin between Stoneleigh and Sutton in Surrey and flows into the River Thames at Barn Elms. Its main tributaries are Pyl Brook, East Pyl Brook and Coombe Brook. Beverley Brook flows through Wimbledon Common and Richmond Park. Two relief culverts (piped underground channels) carry storm flows into the Thames upstream of Barnes Bridge.

**Wandle** - The upper part of the river consists of two branches: the Carshalton branch, which rises from the chalk springs at Carshalton; and the Croydon branch, fed by chalk springs at Waddon, Croydon and Purley. The other main sources are Carshalton Ponds and Waddon Ponds. A tributary of the Wandle called the Graveney, rises just to the west of Croydon and joins the Wandle near Colliers Wood. In its upper reaches the Graveney is known as Norbury Brook. The Wandle joins the River Thames to the north of Wandsworth.

**Ravensbourne** - This rises at Caesar's Well on Keston Common and joins the Thames at Deptford Creek. Its tributaries include the Pool River, which joins the Ravensbourne at Catford, and the Quaggy River (known as Kyd Brook upstream of Sundridge Park), which joins at Lewisham. Both the River Beck and Chaffinch Brook flow into the Pool River. The source of the east branch of the River Ravensbourne

and of the Quaggy River all lie within an area to the east of Keston Common. The South branch of the Ravensbourne and the tributaries of the Pool have their sources between Addiscombe and West Wickham.

**River Cray** - The river Cray rises in the Priory gardens and flows north through St. Mary Cray (historically South Cray), St. Paul's Cray and on through Foots Cray and Crayford to join the Darent north of Dartford.

**Marsh Dykes** - These man-made dykes, drain the low lying areas previously used for grazing. The main watercourses are Thamesmead Canals on the former Plumstead Marshes; Great Breach and Green Level Dykes on Erith Marshes; and Crayford Dyke on the Crayford Marshes. The only river from an upland area here is the Wickham Valley Watercourse, with its source in Oxleas Wood on Shooter's Hill.

**Roding** - The Roding rises at Molehill Green, just east of Stanstead Airport in Essex and flows south to Chipping Ongar where it is joined by one of its main tributaries (Cripsey Brook). South of Chipping Ongar the river meanders in a south westerly direction to Passingford Bridge under the M25 and on to Loughton. A small number of tributaries join it through this section. From Loughton downstream the Roding is essentially an urban river, being joined by small tributaries through Woodford, Wanstead, Ilford and East Ham to join the Thames at Barking Creek. The lower reaches have tidal influences.

**Ingrebourne** - The Ingrebourne rises near Brentwood and is soon joined by the Weald Brook, Carters Brook and Paines Brook before flowing south for a long way before splitting into the southern tributaries of Raineham Creek and Wennington Sewers complex. The River flows through a relatively non-urbanised corridor, with much of the corridor dedicated to public open space and culminates in Raineham Creek just to the west of Rainham Marshes at its junction with the Thames at Ferry Lane.

**Beam** - The Beam rises near Navestock as the Bourne Brook, before becoming the River Rom and subsequently the River Beam. All of the tributaries such as the Wantz Stream and the Dagenham Branch for example, join the river at its downstream end. The catchment is heavily urbanised but does run through a green corridor separating Dagenham from Hornchurch, much of it public open space. The Beam joins the Thames sandwiched between the Ford Industrial Park and Hornchurch Marshes.

**Lee** - The Lee rises in Luton in a southerly direction through Bedfordshire, Hertfordshire and London, joining the River Thames at Canning Town. Tributaries joining the Lee include Pymmes Brook and Cobbins Brook. The Lee Navigation starts at Hertford, and in places becomes the main river channel or runs roughly parallel with the main channel to its confluence with the Thames. The Lee flows through a shallow open valley through Hertford before flowing through a wide open plain to the Thames.

**Brent** - The River Brent derives most of its flow from 'run-off' from the urbanised areas through which it flows with some additional resources coming from groundwater from localised gravel aquifers. The main tributaries of the Brent are the

Silk Stream, Mutton Brook, Dollis Brook, Wealdstone Brook, Costons Brook, Clitterhouse Ditch, Deans Brook, Decoy Brook, Edgware Brook, Edwarebury Brook, Kenton Brook, Mitchell Brook and Wembley Brook. The Brent becomes tidal at Brentford Lock, shortly before joining the Thames at Brentford, opposite Kew Gardens.

**Crane** - The source of the Crane is taken to be a point south of North Hyde Road in Hayes from where the river flows in a southerly direction to join the Thames at Isleworth. The River Crane, as with the Brent derives most of its flow from 'run-off' from the urbanised areas through which it flows with some additional resources coming from groundwater from localised gravel aquifers. Tributaries of the Crane include the Yeading Brook East, Yeading Brook West, the Duke of Northumberland's River, the Longford River, Roxbourne, Hounslow Ditch, Whitton Brook, Cranford Park Brook, Frogs Ditch, Hayes Park Stream, Yeading Tributary, Greenhill Stream & Ickenham Stream. The man-made watercourses of the Duke's River and the Longford River are a particular feature of the Crane catchment. Both of these rivers take water from the Colne catchment and then cross into the Crane catchment. The Longford River goes to Hampton Court, while the Duke's River links the Colne at Harmondsworth with the River Crane at Hounslow Heath before branching off to the Thames at Syon Park. The Crane is tidal for a short distance before its confluence with the Thames.

**Colne** - The Colne rises near Colney Heath in Hertfordshire and flows down the slopes of the Chiltern Hills. The lower Colne is divided into several distinct channels including the Frays River, Colne Brook and the Wraysbury River. Near Uxbridge the River Pinn flows into the Frays which then rejoins the Colne, which finally flows into the Thames at Staines. The Duke of Northumberland and the Longford Rivers are both man-made and split off from the Colne flowing eastward into the Crane catchment.

## Geology

The catchments of South London's urban rivers lie within the London Basin which, towards the South, is an area of Chalk overlain successively by Thanet Sand, sandy gravels of the Woolwich and Reading Beds, Blackheath Beds and London Clay. In the Southern part of the Hogsmill, Beverley, Wandle and Ravensbourne catchments, these top layers have been sufficiently eroded to reveal chalk. Between the London Clay area in the Northern parts of the catchment and the chalk of the southern parts, the narrow bands of Thanet Sand and the Woolwich and Reading Beds are exposed.

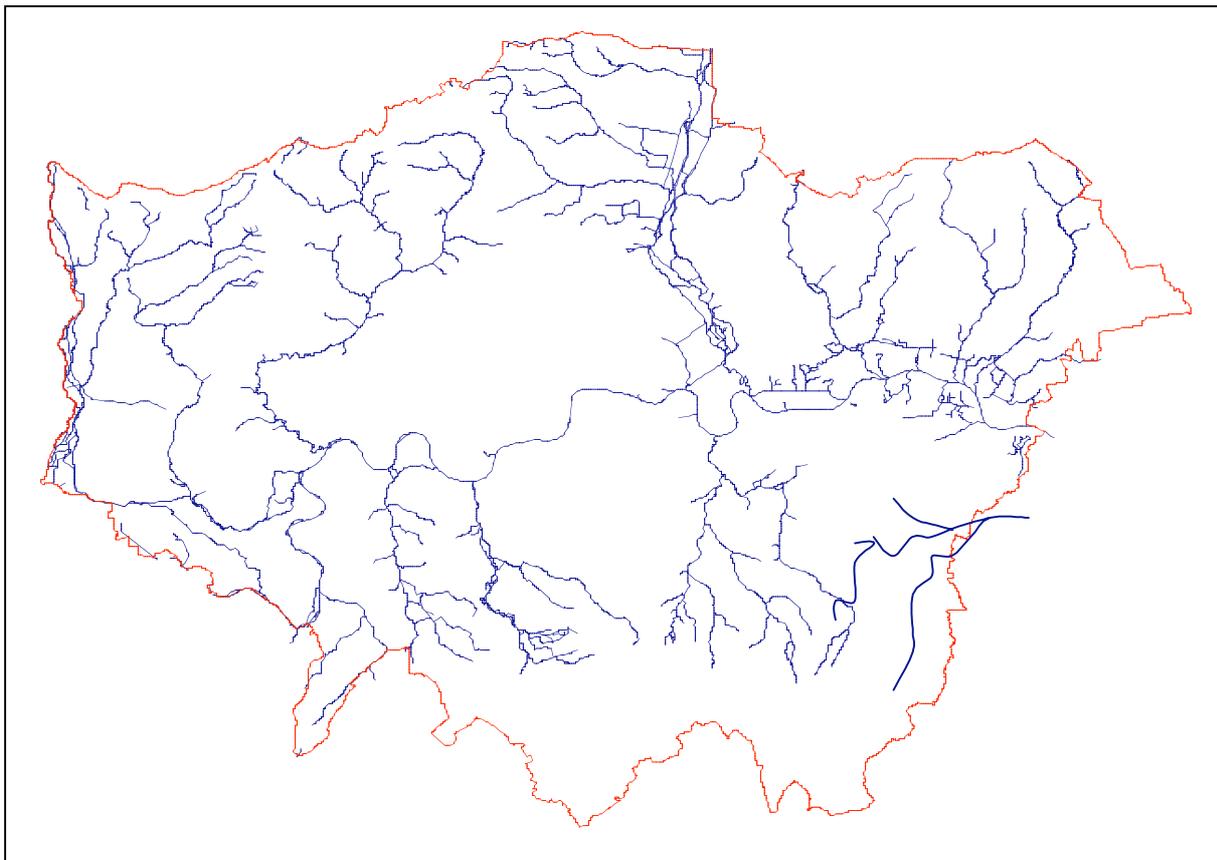
The underlying solid geology of north London is almost exclusively London Clay. This clay deposited 55 million years ago is virtually impermeable and ranges from 10m thick in the North to 120m in the South. Beneath the London Clay are a series of sand, silt and clay beds known as the London Lower Tertiaries. These beds are in hydraulic continuity with the Chalk that underlies them, which enables rivers such as the Brent & Crane to receive supplementary flow from groundwater.

## Topography

The South London catchments are bounded by the River Thames to the north and the North Downs to the south, a distance of approximately 25km, although the Marsh Dykes catchment only extends southwards 6km to Shooter's Hill. The North Downs rise to a height of some 260m above sea level.

The main rivers in the North of London drain in a general southerly direction towards the River Thames. However, in built up areas like London, much of the surface water goes into the surface water drains before being discharged into rivers. The topography of the North London area varies in height from approximately 10m Above Ordnance Datum (AOD) by the River Thames to 115m AOD in Epping Forest. Most of the London area is lower lying land, typically 30-60m AOD.

#### **HA16: Map to illustrate the extent of watercourses in Greater London**



#### **Nature Conservation Importance**

The catchment of London rivers is mainly urban and these rivers provide a valuable green corridor within the built environment. The mosaic of features found in rivers and streams support a diverse range of plants and animals. Grey wagtails and kingfishers can be seen feeding and nesting along London's watercourses. Diverse assemblages of wetland plants can also be seen such as brooklime, water mint, sedges and watercress. Watercourses also provide links between various sites of conservation interest including Special Areas of Conservation, Special Protected Areas, Sites of Special Scientific Interest, Local Nature Reserves and Sites of Metropolitan, Borough and Local Importance, thus connecting plants and animal communities that would otherwise be isolated.

Important populations of common and nationally rare fish species are present within London's rivers. Growing pollution and habitat loss combined to destroy fisheries in the early nineteenth century, however since the 1960's there have been major improvement in waste water treatment and improved river water quality. Fish populations are generally recovering but still remain fragile. There are small populations of minnows (*Phoxinus phoxinus*) and bullhead (*Cottus gobio*). Recent enhancement schemes and river restorations, for example those on the Ravensbourne, have found elvers as far upstream as Norman Park in Bromley.

The water vole has declined by 90 per cent throughout Britain while in Greater London it has disappeared from over 72 per cent of the sites occupied prior to 1997. However, Greater London does support some strongholds for water voles with significant populations at Rainham Marshes, the River Cray, Lee Valley, Crayford, River Crane and Erith Marshes. The Marsh Dykes display some of the finest examples of floodplain grazing marsh and are rich in bird life, plants and mammals.

## Threats and Opportunities

### Threats

A consequence of urbanisation resulting in the loss of floodplain and associated river corridors, has been to increase the "flashiness" of its rivers, meaning that river levels rise very quickly following heavy rain. Historically, the response to an increased demand for land for development and infrastructure has been to culvert, straighten and artificially reinforce the river channels, thereby losing natural features and habitats. Plants and animals including fish are simply washed away in the concrete channels during times of heavy flow.

There are also a number of exotic invasive plant species that have been introduced and subsequently naturalised into London waterways and wetlands at the expense of more natural vegetation. Plants such as floating pennywort (*Hydrocotyle ranunculoides*) and New Zealand pygmyweed (*Crassula helmsii*) can form large mats of floating vegetation that cover and choke the water surface. Within Greater London, floating pennywort is now widespread on the River Lee, River Roding, Wandle and Marsh Dykes. Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*) and other species are also spreading along the banks of our rivers. The introduced Chinese mitten crab (*Eriocheir sinensis*), which burrow into river banks, can severely erode them leading to eventual collapse of the banks. These can be found on the Ravensbourne, River Quaggy, River Wandle, Hogsmill River, River Roding, River Lee, River Crane and River Brent and are another potential threat to freshwater habitats and their native species.

Pollution from many different sources including misconnections within domestic drains impact on the ecology of our London watercourses.

Furthermore, habitat fragmentation is a problem in London, as elsewhere in Britain. It is therefore important to improve degraded habitats to help link existing sites and make them viable.

Climate change may also impact upon the biodiversity of London. The recent colonisation and expanding distribution of certain insect species in the south and east of England for example insects such as Roesel's bush cricket (*Metrioptera*

*roeselii*) and the Long-winged conehead (*Conocephalus discolor*) are rapidly expanding their range in a north westerly direction across Britain. Birds too are reflecting subtle changes in the climate. This means that in order to protect and enhance London's importance wildlife these changes should be reflected in future proposals to improve the watercourses.

## **Opportunities**

There are, however, significant opportunities to restore and enhance our rivers as part of urban regeneration. In order that regeneration is sustainable it will have to recognise the environmental, economic and social benefits of river restoration. Examples of such restoration work can be seen within all our London river catchments.

## **Data Sources**

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