

Fact File

SOUTH LONDON'S URBAN RIVERS:

HOGSMILL, BEVERLEY BROOK, WANDLE, RAVENSBOURNE AND MARSH DYKES



GUARDIANS OF THE WATER ENVIRONMENT



NRA

National Rivers Authority
Thames Region

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FACTS IN BRIEF

Hogsmill

- Main tributaries: The main tributary is the Bonesgate Stream, whose confluence with the Hogsmill River is upstream of Tolworth Court Bridge.
- Source: The Hogsmill River is fed from a chalk spring at Ewell and the Bonesgate Stream which rises near Malden Fashett to the south of Chessington.
- Catchment area: 73 square km.
- Population: 164,000.
- The river once flowed strongly enough to provide power for several riverside mills.
- The Hogsmill River joins the River Thames to the west of Kingston town centre.
- The river and surrounding countryside has provided a setting for several famous paintings including John Millais' "Death of Phelia" and Holman Hunt's "The Hiring Shepherd" and "The Light of the World".
- From its source to its confluence with the Thames the river is 9.9km long.

Beverley Brook

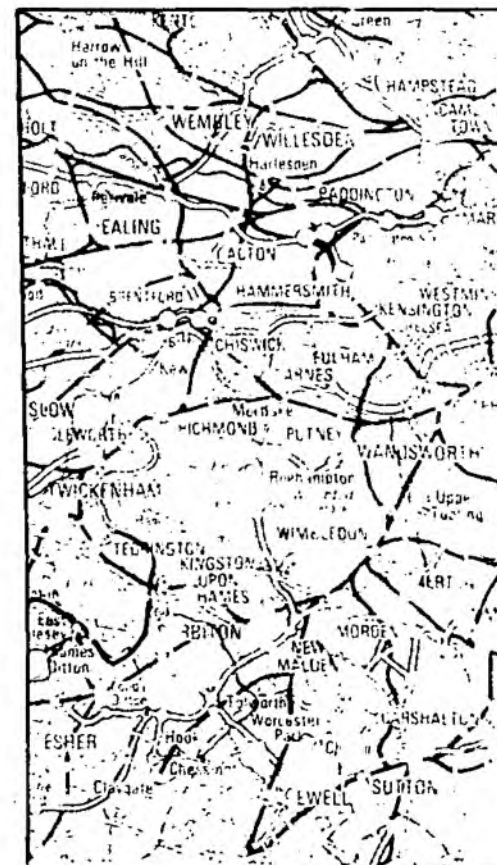
- Main tributaries: Pyl Brook, East Pyl Brook and Coombe Brook.
- Source: The Beverley Brook and its main tributaries are chalk fed along the southern edge of the London Clay between Stoneligh and Sutton.
- Catchment area: 64 square km.
- Population: 186,000.
- The brook flows past Wimbledon Common and through Richmond Park.
- The Beverley Brook joins the River Thames at Barn Elms, although relief culverts carry storm flows to the River Thames near Barnes Bridge.
- During periods of dry weather the Worcester Park Sewage Treatment works outfall provides 90% of the flow in the river.
- From its source to its confluence with the Thames the river is 14.3km long.

Wandle

- Main tributaries: The upper part of the Wandle consists of two arms (the Carshalton and the Croydon) which combine to form the River Wandle. In the lower reaches the Graveney (called the Norbury Brook in its upper reaches) joins the River Wandle near Collier's Wood.
- Source: The Croydon arm of the Wandle rises in the chalk area approximately one kilometre to the north-east of Purley. The other main sources are the Carshalton Ponds and the Waddon Ponds, as well as numerous small springs between Carshalton and Croydon. The Graveney/Norbury Brook rises approximately one kilometre to the east of Croydon.
- Catchment area: 207 square km.
- Population: 630,000.
- The River Wandle joins the River Thames to the north of the Wandsworth Town Centre.
- At one time the Domesday Book recorded 13 mills on the Wandle. This rose to as many as 90 prior to the Industrial Revolution, making it one of the most industrialised areas in the country.
- From the source of the Croydon Arm of the Wandle to its confluence with the Thames, the river is 26.7km.

Ravensbourne

- Main tributaries: The Ravensbourne River is joined successively by the Pool River at Catford, and then the Quaggy River at Lewisham. The Quaggy River is called the Kyd Brook upstream of Sundridge Park. The Beck and Chaffinch Brooks are main tributaries of the Pool River.
- Source: The Ravensbourne rises at Caesar's Well on Keston Common. The sources of the Ravensbourne East Branch and the Quaggy River/Kyd Brook all lie within an area extending 2km to the east of Keston Common. The sources of the tributaries of the Pool River and the Ravensbourne South Branch lie between Addiscombe and West Wickham.
- Catchment area: 180 square km.
- Population: 600,000.
- The Ravensbourne joins the River Thames via Deptford Creek.
- From its source to its confluence with the Thames the river is 17.4km long.



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Marsh Dykes

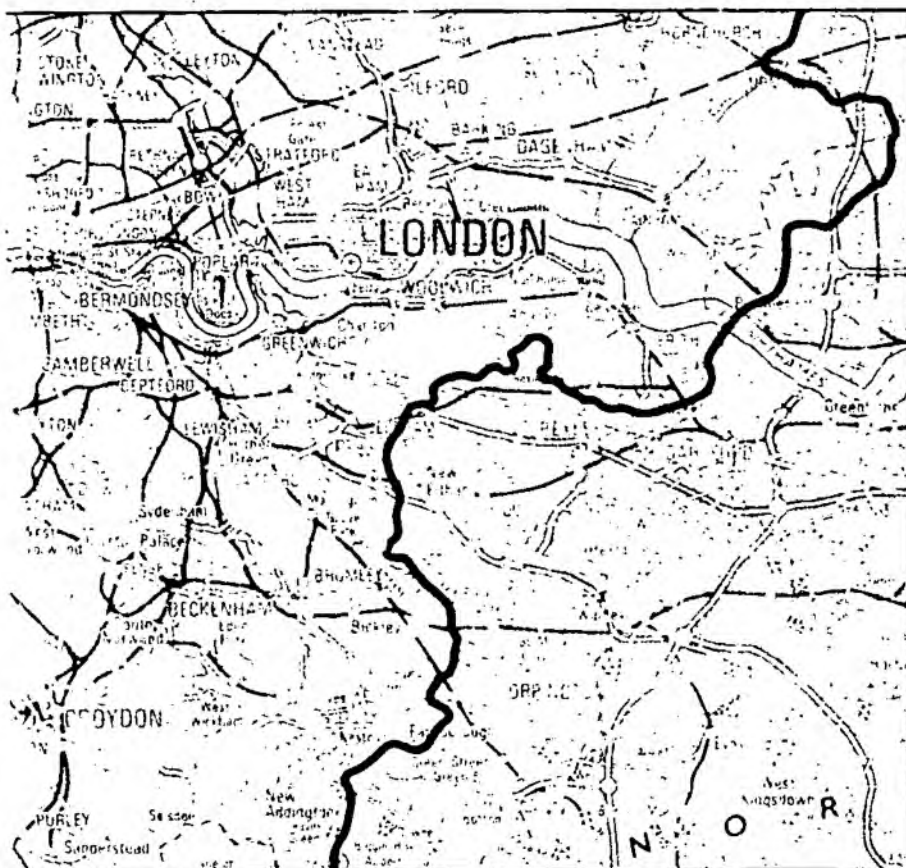
- Main watercourses are Ditts Canal at Thameshead on the former Plumstead Marshes, Great Breach and Green Level Dykes on the former Erith marshes and Crayford Dyke on the Crayford Marshes.
- Source: The Dykes are man-made, draining the low lying areas of the formerly extensive areas of grazing marsh. The only river from an upland area is the Wickham Valley Watercourse, with its source in Cxleas Wood on Shooter's Hill.
- Catchment area: 37 square km.
- Population: 139,000.
- Much of the land is below the high-tide level of the River Thames and is protected by tidal defence walls and embankments. Water can normally drain out under gravity only at low tide, with pumping stations to cope with heavy rainfall when the tide is high. The largest pumping station is Tripcock.

GEOLOGY

These catchments 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, and London Clay. In the southern parts of the Hogsmill, Beverley, Wandle and Ravensbourne catchments, these top layers have been eroded away to reveal the chalk. Between the London Clay area in the northern parts of the catchments and the chalk of the southern parts, the narrow bands of Thanet Sand and the Woolwich and Reading Beds are exposed.

TOPOGRAPHY

These 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.



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THE NATIONAL RIVERS AUTHORITY

Established on 1st September 1989, the NRA is an independent public body charged with safeguarding and improving the natural water environment. It is responsible for flood defence, regulating the quality of rivers and groundwaters, balancing the needs of various water users, protecting and improving fish stocks and promoting water-based recreation of all kinds. The NRA is committed to improving wildlife habitats and conserving the natural environment in all it undertakes.

PLANNING LIAISON

The NRA aims to work with local planning authorities in protecting catchments from undesirable development.

WATER QUALITY

The South London rivers all flow through predominantly urbanised areas, and as a consequence have a higher risk of pollution than rural rivers. There are also a number of sewage treatment works which discharge into these rivers. Run-off from the highways, containing oil and other pollutants, is a major source of pollution, as is the incorrect connection of foul sewers to surface water drainage systems.

During storms the rivers are polluted from many storm overflows that discharge from the foul sewers into the surface water sewers and rivers.

Hogsmill

The quality of the lower part of the Hogsmill is determined by the sewage effluent discharged from the Hogsmill Sewage Treatment Works. Pollution incidents associated with the large surface water sewer at Tolworth have diminished due to the closure of chemical plants and the diversion of polluting effluents to the foul sewer in the late 1970s.

Beverley Brook

Below Worcester Park STW, 90% of the Beverley Brook is treated effluent and consequently water quality is dependent upon the works performance. Improvements to the work's percolating filter beds in 1975 resulted in a reduction in suspended solids, ammoniacal nitrogen and biological oxygen demand and a consequent improvement in quality.

Similar improvement took place in the Pyl Brook following the installation of an upward flow clarifier at Sutton STW which reduced the amount of suspended solids discharging from the final humus tanks. By the early 1970s the Brook supported over sixteen different species of invertebrates. The closure of Sutton STW in 1985 (the flow was diverted to Worcester Park STW) and a comprehensive survey of wrongly connected drains in Sutton High Street brought further improvements.

The Sutton District Water Company have a statutory obligation under the Sutton District Waterworks Act 1903 to soften the water that is put into public supply. The method of softening results in an effluent of calcium chloride waste which is discharged to both the Pyl and the Beverley Brooks. Restrictions are placed on the volume and discharge rate of the effluent to comply with the National Rivers Authority's objective of a maximum of 400 mg/l of chloride in the river at Richmond Park.

Wandle

The river once supported a good fishery but by the 1930s water quality had deteriorated as increased public supply from groundwater reduced the natural springs which fed the river and an increase in sewage effluent discharged to the river from the sewage treatment works at Beddington (serving Croydon), Wandle Valley (serving Mitcham and Merton) and Wimbledon. At this time sewage effluent accounted for over 90% of the total average flow. Industrial discharges also contributed to the general decline.

The 1960s and 1970s brought the following improvements:

- Sutton and District Water Company's decision to maintain the flow in the Carshalton branch at 4,500 cubic metres/day by recycling treated river water to Carshalton Ponds from Goat Bridge upstream of the confluence with the effluent from Beddington (1967).
- The commissioning of a new activated sludge sewage treatment plant at Beddington (1970).
- The diversion of the entire flow of Wimbledon Sewage Treatment Works and part of that from Wandle Valley to Crossness (1971).
- Extension at Beddington STW (1978).

The only direct industrial discharges remaining consist of cooling water.



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The Wandle's main tributary, the Graveney, is entirely confined within a concrete channel from its source near Selhurst to its confluence with the Wandle at Collier's Wood. Like the Wandle, it drains a largely impervious urbanised area so that during periods of rainfall, large amounts of road run-off discharge into the river causing fluctuations in the flow and water quality. The installation of a new oil interceptor and other drainage works by British Rail brought an end to chronic oil pollution from Selhurst Railway Depot.

Ravensbourne

The whole catchment drains a predominantly urban area. Water quality in the Ravensbourne and its tributaries improved in the mid-1960's when the flow (except for a storm discharge) from the outdated South Norwood STW was diverted to Long Reach STW at Dartford, which discharges directly to the tidal Thames.

Quaggy

The Quaggy River was for many years affected by polluted surface water discharges due to wrong sewer connections. These have been gradually corrected, with a resulting improvement in quality.

Marsh Dykes

There is very little natural flow in the dykes and because of the lack of gradient and weirs the levels of dissolved oxygen are sometimes poor. There has been much industrial development in the area, and several companies have been prosecuted for causing pollution in the past. There are a few, small consented discharges, mostly for cooling water.

WATER QUALITY OBJECTIVES

From	To	Length Km	Objective
HOGSMILL			
Bourne Halls	Hogsmill STW	8.2	2B - Fair
Hogsmill STW	River Thames	1.7	3 - Poor
BEVERLEY BROOK			
Source	Worcester Park STW	2.1	X
Worcester Park STW	Tidal Thames	12.2	3 - Poor
PYL BROOK			
Rectory Road	Kimpton Road	1.0	X
Kimpton Road	Beverley Brook	4.3	2B - Fair
WANDLE (CROYDON ARM)			
Wandle Park	Hackbridge Mill	4.4	1B - Good
WANDLE (CARSHALTON ARM)			
Source	Hackbridge Mill	1.6	1B - Good
WANDLE			
Hackbridge Mill	Goat Bridge	1.8	1B - Good
Goat Bridge	Tidal Thames	10.1	3 - Poor
RAVENSBOURNE			
Keston Ponds	Rookery Lake	3.4	E*
Rookery Lake	Tidal Thames	14.0	2B - Fair
QUAGGY			
Sundridge Park	Little Quaggy	3.1	X
Little Quaggy	Ravensbourne	5.6	2B - Fair
POOL			
Source	Ravensbourne	5.1	2B - Fair
MARSH DYKES			
Source	Tidal Thames	17.8	X

E* - Ephemeral: stream is regularly dry. When flowing it should comply with the objective of the downstream reach.

X - Unclassified.



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DISCHARGES

The following are the major discharges into the South London Rivers. The figures given are the maximum amount permitted to be discharged.

Discharge	Cubic Metres per Day	Type of Effluent
HOGSMILL		
Hogsmill STW	86400	Sewage effluent
BEVERLEY BROOK		
Worcester Park STW	71000	Sewage effluent
WANDLE		
Beddington STW	70200	Sewage effluent

BIOLOGY/FISHERIES

The rivers of South London are regularly monitored by NRA biology and fisheries staff.

Hogsmill

A variety of invertebrate families are now present in the river including: caddis flies, freshwater shrimps, mayflies, beetles and freshwater limpets. Downstream of Hogsmill Sewage Treatment Works the water hoglouse, leeches and non-biting midge larvae can be found.

Beverley Brook

The brook supports four mollusc species, freshwater shrimps, and the water hoglouse (Asellus). The invertebrate community is extremely restricted, with only very tolerant species present. A river corridor habitat survey was carried out in 1989.

Wandle

The river supports a coarse fishery and large populations of invertebrate species including the water hoglouse (Asellus), caddis flies, mayflies, freshwater shrimps, freshwater limpets, beetles, leeches, midge larvae and oligochaete worms. A river corridor habitat survey was carried out in 1989.

Ravensbourne

Elvers have been seen in the upper reaches of the Ravensbourne. A recent survey identified Deptford Creek as a valuable breeding and nursery area for flounders. The Quaggy River supports freshwater shrimps. A river corridor habitat survey was carried out in 1988/9.

Marsh Dykes

A fish survey carried out in 1990 discovered excellent populations of roach, perch, tench and bream in the Thamesmead canals and lakes. A major conservation survey by the NRA identified many sites of value and sites where enhancement is appropriate. NRA maintenance operations are making use of this information. The survey confirmed the high value of the remaining marshes particularly at Crayford.

WATER RESOURCES

The major water resource of the area is groundwater in the chalk aquifer of the London Basin. There are many abstractions made from boreholes to provide water for public supply and industrial uses.

Average rainfall over the area is between 550mm in the east and 650mm in the west and south.

In order to ensure that there is sufficient information on river flows, the NRA carries out regular measurements and has a number of fixed gauging stations on these rivers.



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FLOOD DEFENCES

Reducing the risk of flooding from London's rivers forms a part of the NRA Thames Region's work.

The NRA's control rooms at Reading and Waltham Cross keep a round the clock check on weather conditions and river levels. Staff interpret the information and give the local emergency services early warning of possible floods.

Flood defence teams are based at Sunbury, Catford and the Thames Barrier to carry out regular river maintenance work. This includes dredging, weed cutting and general channel clearance. These teams are mobilised during flood emergencies to keep the rivers clear of obstructions so that flood waters can be conveyed away as quickly as possible. They also regularly assist the environmental quality staff in cleaning up after pollution incidents.

The NRA is committed to protecting and improving the natural river environment and wherever possible our flood defence work includes features of environmental conservation and enhancement.

Beverley Brook

Due to frequent flooding the entire length of the Beverley Brook and its principal tributaries was subject to flood alleviation works between 1937 and 1940. These were found to be inadequate in the upper reaches of the Pyl Brook and in 1956/7 further works were undertaken.

Wandle

Following frequent flooding particularly in 1955, major flood alleviation works were carried out along the entire length of the Wandle from Richmond Green to the River Thames between 1959 and 1965. Most of this river is now canalised downstream of Hackbridge Mill. Six mill structures were replaced by automatic level control devices.

Flood alleviation works by the NRA incorporating flood storage at Beddington, are currently in progress.

Ravensbourne

Major flood alleviation works undertaken in the 1960s and 1970s canalised many of the lower reaches. Flood alleviation works to the lower Quaggy River, which incorporate environmental considerations, are planned for 1991-4. In 1991, a study was commenced by the NRA, looking into flood defence needs and opportunities for environmental enhancements.

Marsh Dykes

The most significant works were carried out in the 1960s and 1970s to cater for the development of Thamesmead with drainage canals, storage lakes and pumping stations.



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