

## **The Beverley Brook and Barnes Common**

The Beverley Brook flows briefly along the edge of Barnes Common and Barnes Green, as well as along the edge of the Vine Road Recreation Ground (although it is behind a high fence at this point). The 'riparian owner' of these stretches is the London Borough of Richmond upon Thames (LBRuT). As such, LBRuT is responsible for the maintenance of the banks within their management control. This also applies to other landowners all along either side of the Brook. Consequently, Friends of Barnes Common (FoBC) has an interest in the Brook and its well-being throughout its catchment area.

## **Where does the Brook come from?**

The Brook originally rose from natural springs in the Morden area. As the Metropolitan Water Works expanded to take more groundwater, water from the source near Morden became part of the Morden water works, which also passed some treated water into the Brook to maintain a basic flow. Since the relatively recent closure of the Morden works, the base flow is maintained by water piped from the water works on the Hogsmill. Therefore, today, the inflow of treated water from the Hogsmill Sewage Works is effectively the source of the Brook.

Beverley Brook is fed by a number of tributaries such as the Pyl Brook and other feeder streams, rising in Richmond Park and elsewhere within its catchment area. However, this is primarily surface water and because of this varies considerably by season and levels of rainfall. Today, there is little or no groundwater input, but considerable flow from surface water run-off. This urban run-off is very poor quality and carries a lot of contaminants from roads, including heavy metals and polynuclear aromatic hydrocarbons (PAHs). This has led to contamination of much of the silt you see along the Brook.

## **Catchment Area**

It is not possible – or productive – to look at any part of a stream catchment area in isolation. The key to good management is to have an informed overview from source to end. Like the Wandle, Hogsmill, and other Thames tributaries, the catchment area is quite modest in extent. The watershed is found in the Surrey hills, extending from Wimbledon back to Morden on one side and through Richmond Hill/Park, Surbiton and New Malden on the other.

Historically this grazing and farmland consisted of many boggy areas and woodlands that naturally absorbed rainfall, releasing it slowly into the watercourses. There were also flood plains in the lower catchment as the stream came nearer to joining the Thames. Extensive building on much of the catchment over the last 150 years has led to the drainage of land, greatly increased areas of hard surfacing resulting in rapid filling of drains and watercourses, and increased risk of local flooding. This building on flood plains has led to demands for better flood prevention to protect property built in vulnerable locations.

Old maps indicate that the lower reaches passed through water meadows (eg Moormead, now more prosaically called Barn Elms Southside), with considerable meanders between Barn Elms and Putney Lower Common. Both facilitated a natural capacity to deal with seasonal fluctuation, suggesting this fluctuation may have been considerable. Evidence suggests flow was not sufficient to attract use for water mills, so the Brook is not impacted heavily by barriers and associated impoundments found along many rivers.

## **Flood control – brief historical overview**

People have always tried to control water and throughout history, flood management has been a

complex affair. In the UK, the practice probably goes back to the eighteenth century and by the nineteenth century, was a routine method of draining water from water meadows once the flooding season was over. Water meadows were deliberately 'floated' by a complex system of sluices all along the water courses, usually streams or small rivers, keeping off the frost, bringing nutrients onto the meadows and providing that important 'first bite' of green, resulting in nutrient-rich early grazing for livestock. Opening the sluices encouraged water to move away quickly and not to cause flooding elsewhere. It was a highly-skilled, labour-intensive and complex system of water management.

The natural meander of streams and rivers slows the speed of the water. This is ideal for a trout stream or a cress bed and naturally manages bank erosion. However, it is not suitable if one wants to move water quickly to avoid a flood in an area other than a meadow, and inevitably our watercourses were straightened. This practice (canalisation) was undesirable on a large scale, which is what it became as the Industrial Revolution demanded a further need to transport goods and commodities in large quantities. Rivers were frequently straightened, widened and some eventually lined with concrete. The natural ups and downs of river beds were often flattened out with machinery. Indeed, even in 2015, some current Environment Agency staff remember doing this work! Thinking at the time was to move water through an area as quickly as possible to reduce the local flood risk. However, this simply pushed the flooding further downstream, exacerbating the effect, with many streams becoming little more than open drains.

### **Flood Control – along Beverley Brook**

For over a century, the flow of the Brook has been bound up with the Metropolitan/Thames Water operations, that includes taking water for purification, providing treated water to the Brook and, in the past, providing for overflows. Attention has focused, as elsewhere, on rushing water to the sea wherever flooding seemed likely to happen.

By 1913, Barnes, in the lower reaches, was already suffering flooding extending beyond the normal water meadows. The Great War put flood relief plans on hold, but in 1923 Parliament rushed through provision for a direct channel to the Thames from a fixed spillway at Priest's Bridge to 'the Depot' (It was installed in a 'cut and fill' excavation along White Hart Lane). A second relief channel was soon needed, from Westfields to Barnes Bridge with an automatic flow adjusting sluice. Together these control the volume of water flowing through Barnes Village to the stream's natural outflow into the Thames at Ashlone Wharf. Here a complex barrier prevents tidewater flowing back up the Brook, affording Barnes flood protection from the Thames and from water rushing down from the catchment area.

The flow of the Brook past Barnes Common is thus controlled and quite complex. The first priority is to avoid flooding in the village (the last major flood was in the 1950's). Beverley Brook is also part of the Thames tidal control, taking advantage of the twenty-minute difference in high tides at Putney and Barnes Bridge. The impact of this is that standard flow rate is quite low, and volume can be absorbed when there is significant rainfall upstream or high tides on the Thames. Anyone living upstream of Westfields but below Priest's Bridge will recognise that the Brook is tidal in this stretch, often rising more than two metres during 'Spring' tides'.

Today, the benefit of hindsight and a understanding of the importance of whole-catchment management brings a realisation that re-naturalising a river cannot only actually help reduce flood risk, but also aid water to infiltrate and re-charge the underground aquifers. This helps to reduce flood risk further, and make the river and its surrounds more 'self-reliant' and less susceptible to

drought.

### **Impact**

The building of roads, pavements, paving over of front gardens and building on green spaces has exacerbated the problem. Today, in the head waters of the Brook, particularly on the Pyl Brook, there are almost 'flash floods'. These activities are directly responsible for the need for the Thames Tideway Tunnel. Thames Water notes that although the population has massively increased, leading to much more sewage being produced, it is not this that is the problem - it is the increase in the amount of impermeable surface area that results in drains being overloaded with rainwater, which mixes with sewage in the sewer system, then overflows to rivers through Combined Sewer Overflows (CSOs) when the sewage treatment works lack capacity. In October 2015, Thames Water is also investing in Sustainable Drainage Systems (SuDS) as well as the Tideway Tunnel to address these issues.

You can help!! Introducing water butts to temporarily retain rainfall and removing paving to reduce surface run-off are just two examples of what can be done by individuals. Globally, there is increasing recognition that as a vital commodity, fresh water should, as far as possible, be harvested and released slowly – by such simple means as collecting rainwater to use for garden watering. More complex household or commercial brown water schemes include using untreated water to supply toilets or passing rainwater from roads through SuDS into ponds...there is much more that can be done to improve the situation in an economically viable and sustainable way. Arguably it would help if Planning regulations across the catchment area could be harmonised in favour of reducing hard surfacing and encouraging more rainwater harvesting.

### **Natural stream versus controlled watercourse**

Currently, Environment Agency policy is to replicate a natural stream as far as possible, whilst recognising the need to meet water quality standards, supply water where needed and avoid flooding. This is a reversal of the trend of the past century that saw canalisation and control as the answer. The aim is to slow down release of water into streams, to capture water in the aquifers, and to encourage wildlife by providing favourable habitats within streams and along their margins. Where possible, this revised approach facilitates the removal of concrete walls in favour of natural banks that can provide backwaters, where flood water can be stored and fish can find refuge when the stream is in flood. Long stretches of shallow water offer little habitat for fishes. Therefore, it is also important to replicate 'riffle and pool' sequences created in natural rivers, often together with meanders, especially in the lower stretches. These features result naturally from a combination of the energy a river has in its flow and the characteristics of the bed and bank.

### **Stream Width, Flow Rates and Silt**

Interventions along Beverley Brook over the last century or so have left an unnaturally wide, straightened and shallow stream bed (signs of toe boards in Richmond Park show the attempt to create a stream bed about twice the natural width for the normal flow rate, but also show how the banks have eroded since). The natural profile of steep headwater streams is a V-shape in the upper reaches, whereas much of the Brook's bed today resembles a flat U-shape. It is possible that originally much of the course below the Surrey hills would have been boggy with ponds and anastomosing (re-connecting) channels, reflecting scouring from rapid changes in flow as storms pass through. Near its confluence with the Thames, old maps offer evidence of a meandering stream winding through a much wider flood plain.

The present rapid draining catchment area means water volume increases dramatically and water levels rise rapidly. The resulting fast flowing water carries silt, largely from road run-off, contributing to the scouring effect of the poached and eroded banks in Wimbledon Common and Richmond Park, where the banks are stripped bare of vegetation by deer and trampled by deer, dogs and people. This means that in flood, Beverley Brook carries a lot of silt (and an extraordinary number of golf balls!). As velocity slows, all this sediment drops out, as happens in Barnes Common and further downstream after the main flow has been diverted to the Thames.

This is another good example of the need for catchment management – if road water drainage was more frequently passed through SuDS treatment and some of the bank erosion upstream can be fixed, there should also be less silt depositing in the lower reaches of the river. Work in hand at Richmond Park is one such action, where access to the river banks by deer and dogs will be limited, but much work is needed upstream of this as well.

### **Cleaner water – more fish**

Effluent escapes and damaging dumping of waste can still occur. However, considerable effort has gone into cleaning up the water in the Brook and volunteers have been trained to monitor and investigate when problems arise and to try and identify the causes. A few years ago, the Environment Agency released chub (a native species of river fish) into the Brook which can now be seen in Richmond Park where they have flourished and spread downstream. Fisheries surveys in recent years have found eels, dab and stickleback. Dab (the flatfish also known as flounder) use the Thames tributaries as spawning ground. Stickleback are a favourite food for kingfishers – particularly the breeding pair that have been on the lower reaches of the Brook for some years! The decline in the European eel population is a major concern, but with signs of a modest recovery recently, eel ladders like the one at Ashlone Wharf are being introduced to help bypass barriers. Recent EA fish surveys (June 2015) showed a surprisingly good fish population. The South East Rivers Trust are awaiting official reports and will share these through the catchment partnership.

### **Marginal Plants**

Another reason for creating more natural banks is to encourage marginal habitats suitable for water voles and other stream-living creatures. Many species with an aquatic life stage, such as damselflies and dragonflies need this marginal vegetation: in their larval stage, they use marginal plants to crawl out and emerge. Juvenile fish also find refuge within the sheltered shallows safe from many predators. Mud and damp banks are habitats for many invertebrates, molluscs and amphibians. The fertile soil and supply of water makes for much greater variety and vigour of flora and fauna than typically found on dry land.

### **Unwanted Species (including Himalayan Balsam)**

Unwelcome and invasive non-native species spread for many reasons, including human intervention and the lack of natural predators to keep them in check that exist in their country of origin.

In our area, the most obvious is Himalayan Balsam. Introduced by the Victorians as a pretty garden plant, it thrives in streams and wet ground, and if left can clog up watercourses. It is an offence to plant or encourage this plant in open spaces. Unfortunately seeds disperse widely from ripe seed pods, can float on water, and spread rapidly once in a river. In August 2015, so far as we are aware, there was no Himalayan Balsam upstream of Priest's Bridge. This does need confirmation, as clearing needs to start at the highest point in the catchment if it is to be successful. However, there is a large quantity downstream of Westfields and we need to understand why. Suspicion falls

on water entering from the Thames (which is infected upstream of Barnes) on the high tides, backfilling the direct channels. If so, it may be very difficult to eradicate, but if not, there is a good chance to eradicate through Barnes Common and downstream to Ashlone Wharf.

Over the past five years, the Friends of Barnes Common (FoBC) has pulled Himalayan Balsam from Beverley Brook by the Common, and for the past two, also headed further upstream along Willow Avenue to reduce re-seeding from upstream. But pulling from the downstream areas is not our responsibility, and although we have a strong team of volunteers, we just do not have the manpower to do all this. Further, health and safety is an issue that needs to be highlighted here: some of these downstream areas are too dangerous for keen amateurs to undertake work, due to the tidal Ashlone Wharf complex and the very muddy stretches above that. Therefore, what is required is a major coordinated effort in which volunteers can then play their part alongside professionals.

This all highlights the very real opportunity to work in partnership with others upstream through the Beverley Brook Partnership. A useful starting point would be to map the extent of Himalayan Balsam to help determine the upstream limit where pulling needs to start - otherwise despite all our efforts, we will always end up with Himalayan Balsam on the Common.

### **Wanted and Unwanted Debris**

Within any watercourse, natural leaf-fall, sticks, plants and natural silt are all part of an ecosystem needed for healthy stream life, providing habitats and food for many creatures. Presented with any clear area of open water, most of us wish to throw something into it, be it a stone or a stick. Perhaps our dog likes to retrieve sticks but then leaves them in the water. Children love to build dams (we know we did!) – or simply enjoy the sound of a resounding almighty 'splish'! Unfortunately, while one stick or stone or log may not make much difference, tens or hundreds do, and all this unthinking human activity can add up to trouble when it clogs up the stream. Unfortunately, this happens too frequently downstream of the Common. Obviously, unwanted litter should never be thrown in, and we should encourage child-made dams of 'natural' sticks and stones to be removed when play has ended.

Equally, any branches or logs that have naturally found their way into the Brook should be left alone, please. In the event of logs or branches presenting a flood risk, the Environment Agency will remove any obstruction– they frequently check the river and clear anything they consider to be a risk, as their role is to reduce this risk to people and business. This means they may only move it to the river bank. This can result in piles of rubbish being put on the bank (providing a ready stash of material to be thrown back in!!)...again, another opportunity for us to coordinate with the Agency Operations Team – and muster willing volunteers, the council etc - to remove the rubbish after the EA Team has been through. A good general rule of thumb is that if it is inert, and arrived naturally, leave it.

However, earlier this year, FoBC removed over 150 granite setts from the Brook, which ought not to have been dumped on the Common in the first place. The key question we all have to ask ourselves is 'what if everyone did this?' – that soon suggests what is right and what is wrong! Interestingly, rubbish/litter dumped in rivers is an issue because of a legal loophole: it is actually no-one's responsibility to remove it. But it is the 'spirit of the law' that we address, as do other community groups. More and more evidence is emerging about the deleterious impact of plastics which break down very slowly and are ingested by wildlife in rivers or in the sea where the plastic eventually reaches.

## **The future**

Great improvements have been made to the River Wandle, and there is now a group of organisations with connections to Beverley Brook looking to make similar improvements. Regular meetings are held to consider needs, and what can be done. FoBC is an active participant in this forum and our reed bed at the top of 'Maisie's Meadow' near Glebe Road is one example of the sort of small-scale local improvement which can be achieved, and which could, if repeated elsewhere, have an increasing impact along the whole Brook. We have also raised the possibility of restoring the river bank margin along the edge of Vine Road Recreation Ground by creating ponds, a backwater, and more marginal habitats instead of the present metre high concrete and block wall with six foot barbed wire fence. Other ideas include improving the riffles and pools along the Brook by the Common by installing suitable in-channel features similar to those being installed in Richmond Park. However, this needs careful planning and the priority is to establish what would be possible under the current and future flow regime of the river. It appears likely that something could be done with the existing flow which would also reduce siltation, but much depends on the gradient of the river and its energy in our area as well as the flood and tidal water capacity needed.

Improvements to Beverley Brook will take coordinated effort over the whole catchment area by many statutory and non-statutory organisations, including local Friends' groups, the GLA and London Boroughs of Merton, Wandsworth and Richmond upon Thames, the Environment Agency, Thames Water, the South East Rivers Trust, land owners (including Royal Parks and Wimbledon and Putney Common Conservators), conservationists and members of the local community, to name but a few. It will require considerable funding, although support for improved rivers and water quality to meet EU standards does mean that funding is available at least for those actions which contribute most towards such targets, while Thames Water has a budget for works associated with and compensating for disruption due to the Thames Tideway Tunnel. Volunteers are vital to this ongoing work in many ways, including helping to monitor the Brook and passing on information to the wider community.

As indicated above, this is a complex subject, and we by no means have all the answers....but that is all the more reason to show how much we care and become involved in the stewardship of this space that means so very much to us all – we are all the drivers of change and improvement - each and every one of us has something to contribute however big or small. We welcome enquiries, expertise and offers of help because ultimately, together we will be the ones who make change happen!

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