

# The Hogsmill in November 2023

It's been "water, water, everywhere" along the Hogsmill this month. Not only has this produced strong flows down the river, but also natural "backwaters" and, unfortunately, an early start to winter pools on the paths.



At last there've been proper autumn colours on the trees to admire in the sunny interludes, though the wind and rain have now brought many of the leaves down creating colourful carpets along the banks.



There've been some exciting finds this month: a flint axe dropped by an "ancient mariner" in the Hogsmill; and some mayfly larvae in our river sampling, a species rarely found in urban rivers as they need clean water and good habitat to survive. There've also been increasing sightings of some of our iconic birds, especially an early return to the Ewell ponds of a kingfisher that hopefully will take up winter residence there.

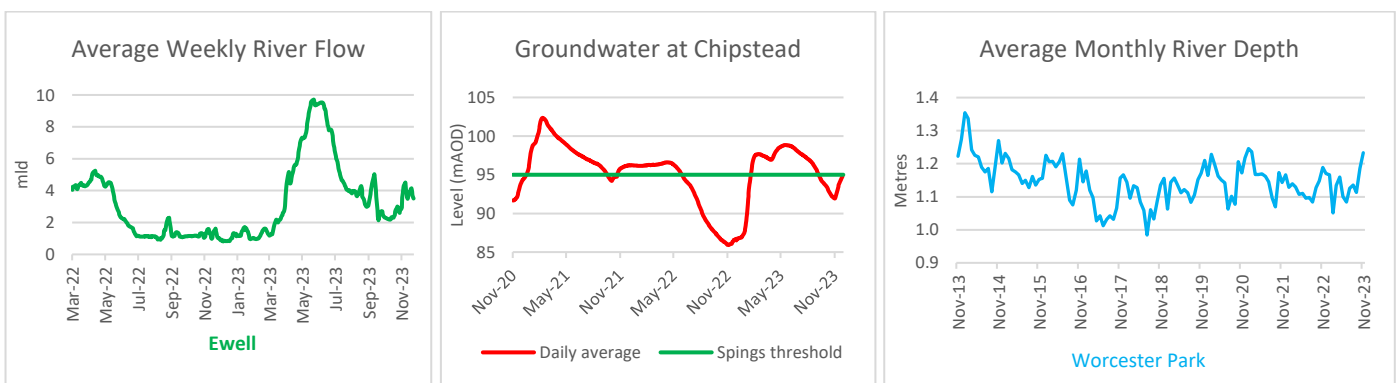


Photos thanks to Bourne Hall museum      Mayfly larva

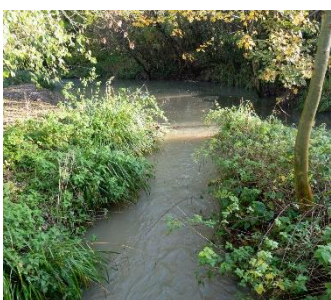
This newsletter looks at what is happening to the natural world along the Hogsmill, including the problems it faces and volunteer activities to monitor and restore its habitat, working with the South East Rivers Trust (SERT) and other local groups and alongside the Environment Agency (EA) and local water companies. This month it also looks at the various sources of water that flow into the Hogsmill .

## The Hogsmill in November

Around 200mm of rain fell on the Hogsmill in the month from mid-October, about 3 times the normal. The immediate impact on the upstream section of the river wasn't that great, but the decline in groundwater has gone sharply into reverse and late in the month the springs seem to be flowing again, though so far only slowly. The effect further downstream has been much more marked. There've been the usual storm surges, but the water level has been much slower than normal to fall back afterwards as flows down the tributaries and through outfalls have continued to be high; and the level looks to be heading for a monthly average that has not been significantly exceeded since 2014, a very wet year.



Not surprisingly the river has been murky for much of the month, though with so much rain and surface water run-off it has not looked as bad as might have been feared. While more water in the river is usually welcome, there can be too much of a good thing: the new Chamber Mead wetlands lived up to their name with the recently-constructed pools filling up with water to such an extent that work to divert the Green Lanes Stream had to be delayed, though it has re-started with the new pools now linked to the main river.



Bonesgate confluence



Elmbridge Meadows



Chamber Mead

(Photo thanks to SERT)



Early in the month, several Hogsmillers joined other volunteers at the annual London Citizen Science Forum kindly hosted by ZSL. As well as a great opportunity for networking, there were excellent presentations. Points of note for the Hogsmill were: Thames Water (TW) is developing an outfall referencing system that should help with our next Outfall Safari and pollution monitoring generally; riverfly monitoring data is being transferred to a new data system that the Hogsmill will be joining shortly; and more riverfly training sessions

are planned for 2024. EA also told us about their new Supporting Citizen Science project designed to engage better with volunteers and to make more use of the data they produce. New “lead contacts” have been appointed; for us that is Josh Hammond. The day was also a chance to try to find more recruits!



(Photo thanks to Sivi)

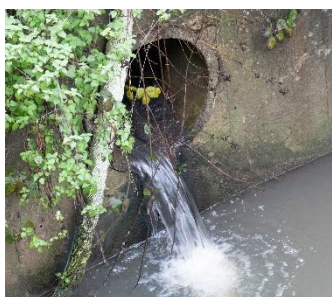


“We’re very good at counting fish!”



New volunteer opportunities will soon be available as SERT has been awarded a grant under TW’s Catchment Partnership Support scheme for a project to understand better the physical environment and water quality issues on the Hogsmill. Part will involve physical habitat appraisals, including special modular field surveys (MoRPHs), planned for Spring 2024, to identify priority areas for restoration. Part will involve water quality appraisals to improve identification of pollution sources. A working group, including volunteers, will develop a monitoring programme; this is likely to involve direct water quality testing as well as possibly extending riverfly monitoring. The plan is for volunteers to carry out this monitoring in the second half of 2024.

The rain has again triggered several discharges from Combined Sewer Overflows - this month these have totalled over 30 hours at the Hogsmill STW and 5 hours at Ewell; and further “black flows” of run-off from outfalls close to roads. There have also been clear signs of pollution at some regular “problem” outfalls.



Malden Way South



Middle Mill



Knollmead



King Charles Road

If you see pollution in the river or indications of possible pollution, such as dying fish, please call the EA Hotline: 0800 80 70 60, and ideally take a photo. You can also contact Thames Water on: 0800 316 9800 (option 2); on: [www.thameswater.co.uk/help/report-a-problem](http://www.thameswater.co.uk/help/report-a-problem) or on twitter: [@thameswater](https://twitter.com/thameswater).

## Hogsmill RMI in November

The River Monitoring Initiative (RMI) is a national scheme that uses “scores” based on counts of a few “water quality sensitive” invertebrates collected in net samples to assess river health.

The 6 main-river sites were surveyed between November 16<sup>th</sup> and 18<sup>th</sup>, most in unusually high and fast-flowing water – almost 10cm above last month at a couple of sites. We were pleased to be joined at one of our surveys by Michele, EA’s Catchment Officer for the Hogsmill.



Ewell Storm Tanks site  
(Photo thanks to Robb)



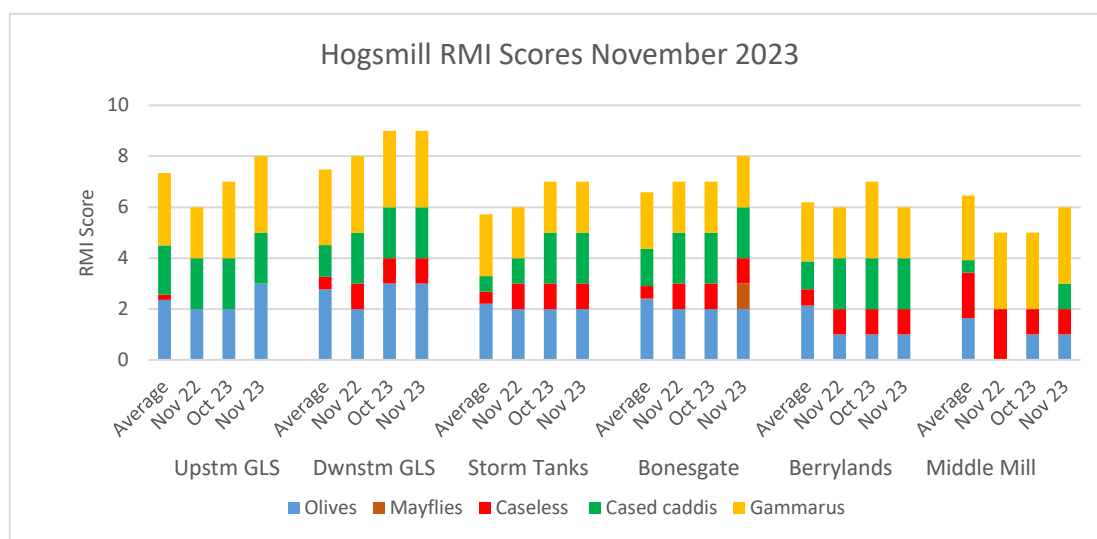
Green Lanes Ewell  
(Photo thanks to Pamela)



Bonesgate



Scores were mostly slightly up on last month; and the overall average was the highest this year. But the improvements in counts were mostly small, continuing a pattern of generally only slow changes in numbers over the past few months, perhaps surprising with the variable weather and river conditions:



- The highlight was finding 2 mayfly nymphs (*ephemeridae*) at Bonesgate. Only once before – 4 years ago also at Bonesgate – has a mayfly been found in Hogsmill surveys; and none appear to have been recorded in RMIs on the Wandle or Beverley Brook in recent years. They are highly sensitive to poor water quality, so their presence on the Hogsmill is a very positive sign;
- The only site with a lower score and counts than October was Berrylands, though this doesn’t look a significant change: the falls were quite small and the counts were close to those for last November;

- At the other sites – both of those by the (present) Green Lanes Streams confluence and Middle Mill – counts of all species were higher than last month, though apart from big rises in gammarus at all 3 sites, the increases were fairly small. These higher gammarus counts did though mean that the total number of invertebrates recorded across all sites was the highest since July.

## Where does the water in the Hogsmill come from?



The river that flows into the Thames at Charter Quay in Kingston comes from an eclectic mix of sources that differ widely in the amounts, variability and quality of water. We now know more about some of these, thanks in part to a study of low flows along the upper Hogsmill (LFS) undertaken by TW and SES Water as part of the water industry regulatory process.

The “jewel” is water from the North Downs aquifer that emerges in [springs](#) in Ewell and makes the Hogsmill one of only about 200 chalk streams in the world. The springs flow through vents in Bourne Hall Lake and down a channel into the Horse Pond. This “natural” flow is augmented by water pumped from the aquifer into a fountain in the Lake and also a pipe in the Upper Mill Pond.

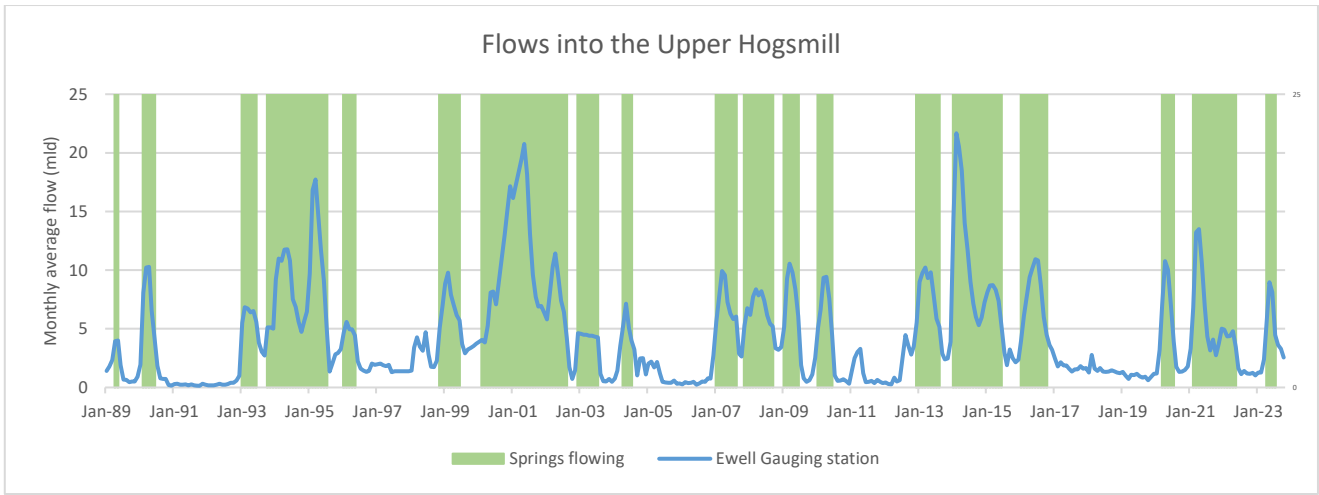


Natural springs

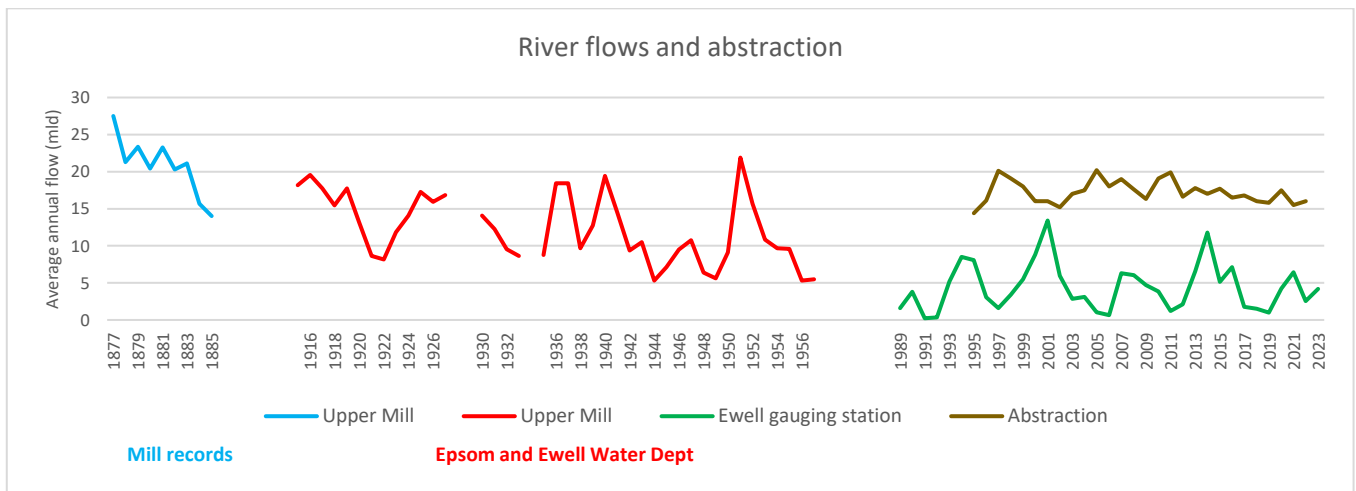
Augmentation

Such spring water is particularly valuable as the chalk-filtering makes it very pure with the potential to create excellent habitat for wildlife. But its contribution to the river is now relatively small and variable.

Flows through the springs are not measured directly, but can be inferred from readings at EA’s gauging stations. Over the past 35 years, flows at Ewell, which include some surface runoff but mainly water from the springs and augmentation, have averaged around 4-5 megalitres per day (mld). But they have fluctuated substantially. For about half the time, the natural springs seem not to have been flowing at all; in the early 1990s the upper stretch of the river almost dried up completely, but augmentation of about 1 mld starting in 1995 has maintained some flow since then. At the other extreme, sustained periods of very wet weather, as in the winters of 2001 and 2014, have led to periods of flows up to about 20 mld.



The generally meagre flows in recent years contrasts with the situation over a long period of history when there was sufficient flow to drive water mills all along the Hogsmill: 11 were recorded in the Domesday Book and less than 200 years ago there were 2 large mills close to the springs in Ewell. At that time, writers such as Holman Hunt and Richard Jefferies were also commenting on the rich wildlife, including trout, in the river. Old records, though of uncertain basis and for different locations to the gauging stations, provide clues as to the scale of the changes. Mill records show flows in the Upper Mill Pond averaging about 20 mld in the late 19<sup>th</sup> Century while local Water Department data indicates flows averaging around 15mld in the early 20<sup>th</sup> Century and about 10 mld in the middle years. Both show large fluctuations, many of which appear to be weather related: for example, low flows in dry years in the mid-1880s. But up until the mid-1950s, when Bourne Hall Lake dried up in a drought, there were few instances when flows dropped much below 10 mld.



Although it is hard to prove a precise link, it seems clear that the major reason for the lower flow now is abstraction of water for public use. There are several boreholes in the North Downs aquifer that could affect the springs, the largest being TW's at Epsom and SES's at Nonsuch Park. We don't have comprehensive records of the build-up of abstraction, but since the mid-1990s the amount taken has averaged around 16 mld, that is about 4 times the average amounts currently flowing from the springs.

Not all is likely to be a loss to the Hogsmill, but hydrological modelling suggests that without abstraction the flow through the springs *might* rise by at least 11 mld on average. It also suggests the flow *might* become more variable with a smaller effect in dry spells when groundwater is low, but even so the potential benefit to the Hogsmill would be massive. TW and SES have both expressed ambitions to reduce substantially the amounts abstracted, but the difficulty and cost of filling the gap mean that much is unlikely to happen soon.

The stretch of river where water from the aquifer predominates - a “proper” chalk stream - is now relatively short, less than 1km out of a total of 10km, though the Chamber Mead project will extend this by a further 200m. Beyond that it is increasingly diluted. Over the next 2km up to the confluence with the Bonesgate stream, water from 4 tributaries and about 20 surface water outfalls, much of poor quality, adds to the flow.

The first tributary, the [Green Lanes Stream](#), rises on the edge of Epsom Common but mainly consists of surface run-off. Much of its 3km length is in a culvert that drains central Epsom and when it emerges it picks up water from around 35 outfalls, including ones from the Longmead Industrial Estate, and Epsom Storm Tanks. Water quality indicators generally show scores for the Stream that are low and below those upstream on the main Hogsmill. Monitoring once a month in 2020-22 for the LFS recorded flows into the main river averaging 1-2 mld, but the “flashy” nature of the Stream mean they were highly variable.

Downstream of the confluence with the Stream there is a rather mixed section: a relatively “unspoilt” area around the Stepping Stones that surveys suggest has some moderately good water quality and then a “concreted” area around the Ewell Storm Tanks that has the lowest RMI scores of all our sites.



Epsom culvert

Epsom Storm Tanks  
(Green Lanes Stream)

Confluence

Stepping stones

Ewell Storm Tanks  
(Main Hogsmill)

Further downstream, the river is joined by 2 small tributaries. The [Ewell Court Stream](#) rises in Nonsuch Park but is then in a culvert for around 2km before emerging at the top of Ewell Court Lake and then flowing a short way to the Hogsmill. Flows generally appear low, though LFS monitoring suggested they averaged 1-2mld in 2020-22. Water quality is not monitored, though there have been a number of pollution incidents along the culverted section. The [Horton Stream](#) rises in the Country Park and flows about 2km to join the Hogsmill by Ruxley Lane. Flows were estimated to average about 1 mld in 2020-22. Although not culverted it is lined with over 20 outfalls, a couple of which were found to be quite badly polluted in the 2021 Safari.



Stoneleigh culvert (Ewell Court Stream) Confluence



Chessington Road (Horton Stream) Confluence



The next tributary is the [Bonesgate](#), the largest on the Hogsmill, its branches rising in Malden Rushett and flowing for nearly 5km to the main river. Occasional monitoring suggests flows into the Hogsmill averaged 4-5 mld in 2020-22; that is, at least as big as those from the Ewell springs. The upstream section runs through farmland, and while this gives it an unspoilt rural appearance, it has also created problems: soil and chemicals washed into the stream after rain have led to large surges of “brown water” down the stream, though these have been less noticeable recently. The lower section is heavily modified and lined with outfalls, including one at Cox Lane that drains an industrial estate and has in the past been a major source of pollution.



Rushett Farm



“Browngate” Jan 23

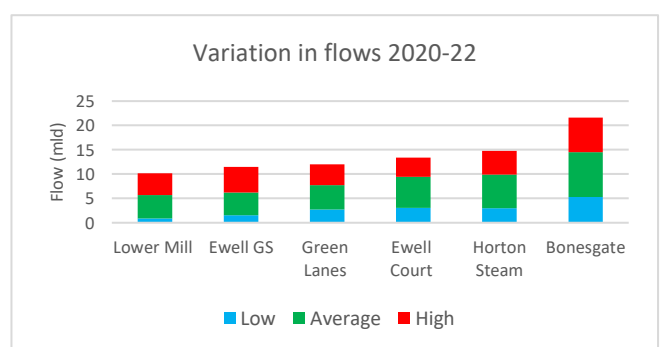
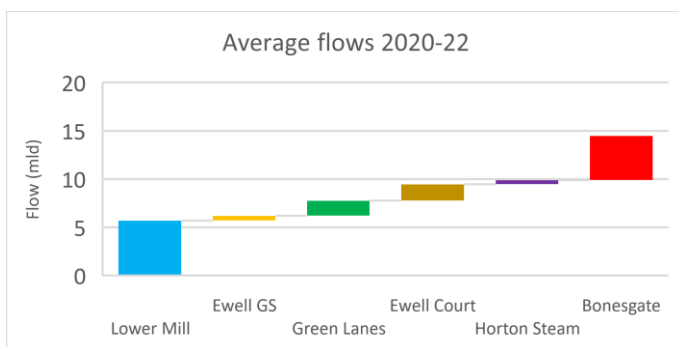


Cox Lane



Confluence

Beyond the Bonesgate, the flow is dominated by surface water: the springs only accounted for about a third of the average flow of nearly 15 mld in the monthly monitoring in 2020-22. Not surprisingly as surface water tends to be more “flashy”, flows were also more variable moving further downstream.



Downstream of the Bonesgate is a stretch of almost 4km to the Tolworth Brook with few new sources of water: a few tiny streams and over 40 surface water outfalls. There is no monitoring data, but any additional flow is likely to be small. Several of the outfalls have pollution problems that are much improved after TW investigations but still re-occur periodically; and there are parts that have been especially heavily modified.



The [Tolworth Brook](#) is another mixed stream, rising in rural Chessington, before a long concreted stretch in Tolworth then flowing through a partly re-naturalized section in the Berrylands Nature Reserve. We don't have data on flows, but from EA's depth gauge the Brook is very "flashy" with the level rising by up to 1 metre in a few hours after heavy rain. Pollution from run-off is likely along the concreted section, but the results of our RMI surveys are moderately good since improvement works at the Nature Reserve in 2018.



Chessington



Tolworth channel



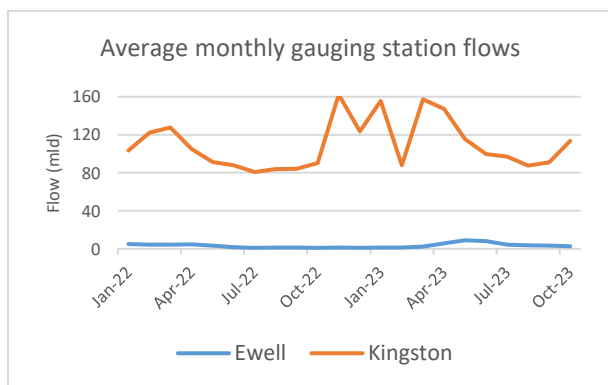
Berrylands Nature Reserve



Confluence

The final major source of water, and a massive one, is the [Hogsmill STW](#). Some comes from the storm tanks that so far this year have been recorded as spilling at least 30 times for over 150 hours. But the vast bulk is very large amounts of treated wastewater that are released into the river. These vary widely: even within the course of a typical day, recorded flows at the EA gauging station just downstream fluctuate substantially at different times of day, while there are also big day-to-day and month-to-month variations, presumably reflecting the amounts of surface water run-off entering the sewage system as well as variations in domestic and business water use. But flows into the Hogsmill appear to average 80-100 mld.

The river in its last 1km down to the Thames is therefore very different from that upstream of the STW. 80 per cent or more of the flow at the Kingston gauging station is effluent from the STW while the volume of water here is some 20 times greater than that passing the Ewell station at the upstream end of the river. The different composition also affects water quality: while effluent from the STW is thoroughly treated, studies have shown relatively high levels of some chemicals, metals and microplastics in the river downstream of the STW; and there are the storm tank discharges, albeit ones that are heavily diluted.



Hogsmill STW outlet



Kingston gauging station