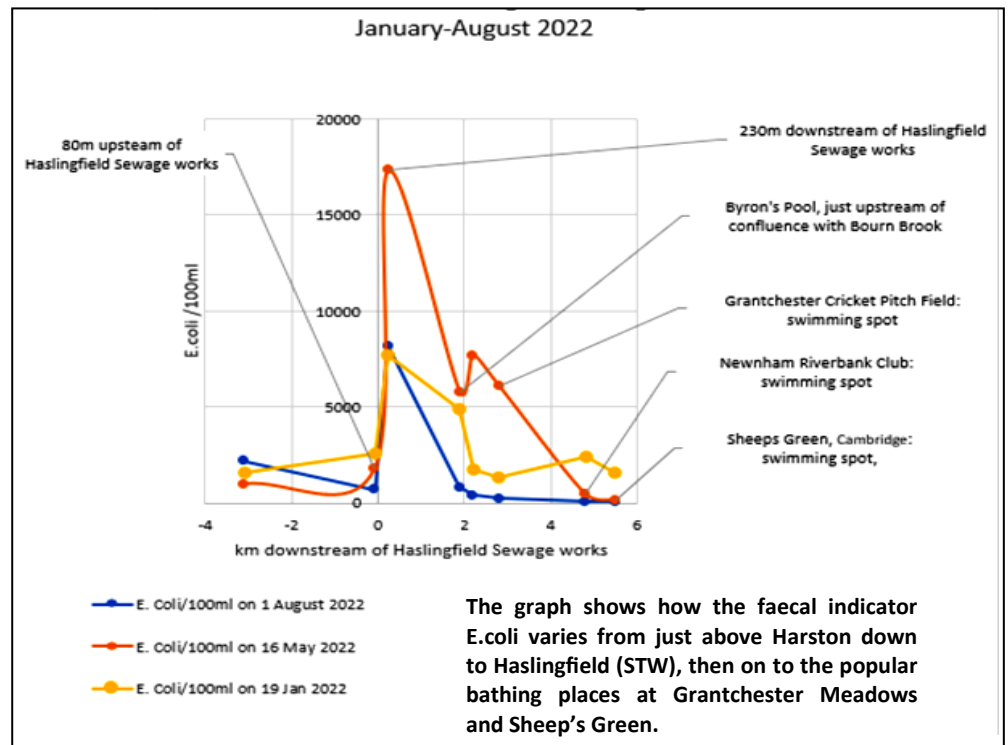


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Over a period of some two years the CVF has been engaged in a herculean Citizen Science programme of pollution measurement under the relentless leadership of Dr. Mike Foley. Reports on findings can be found on our website. This is the most recent. (See pages 4-8.)

The first scientific question posed for this study was, "To what extent is faecal source microbial pollution attributable to STW (Sewage Treatment Works) effluent?". The monitoring team thus sampled microbiologically, in all, over a period of 16 months (June 2021- August 2022), on a total of 7 occasions (mornings), with up to half a dozen (two person) teams at a grand total of 47 carefully selected sites. In the Cam Valley there are a total of 37 STWs.



Tests over a range of flow and weather conditions clearly indicate that a number of small upstream village STWs are frequently discharging 'treated effluent' into the river that might well produce hazardous microbial conditions for swimmers. Although swimmers and other river users will find the results of great interest, our results CANNOT be used as guidance as to where or when it is safe to swim, if only because pollution varies widely over time and over short distances within river channels.

In the single storm overflow event that we were able to capture at Haslingfield STW, the hugely elevated counts of indicator bacteria belie the oft-stated view - including Anglian Water's - that 'overflows' comprise only "extremely diluted" sewage.

Nevertheless, rewardingly and encouragingly, Anglian Water has been sufficiently impressed by what we are implying that they are furthering CVF's work by their own extensive sampling at the same 19 points, selected by Mike, focusing on Harston through Cambridge to Clayhithe.

Phosphate and nitrate pollution are not as big a problem, in the public eye, as faecal pollution but there is no doubt that they have a much greater and significant detrimental effect on the ecological balance of our streams. Indeed, for Chalk streams, it is a killer.

Nitrate levels are high throughout our Cam aquatic

ecosystems. Phosphate alone, without nitrate, is much less harmful. However, the very high and prevalent nitrate levels in groundwater within the Chalk aquifer, due to past fertiliser use, will continue to pollute spring water for decades to come.

It is the phosphate which, in theory, can be kept under control, so the second research question was, "To what extent is soluble reactive phosphate pollution attributable to STW effluent?".

In total some 88 sites were sampled on 9 dedicated phosphate-testing days up to August 2022. Again samples of river water or sewage treatment works' final-effluent were taken by volunteers and were again analysed at the UKAS-accredited South East Water laboratories.

There is ample direct evidence that SWT effluent can markedly increase the levels of phosphate in the watercourse. Melbourn, Bassingbourn, Linton, and Newport STWs are examples. Farms (in the Cam Valley at least) are not a prime source. By our reckoning the quality of our streams is often POOR, on the EA scale. One can only wonder at EA's powerlessness and the past failure of Anglian Water to put its house in order.

CVF questions the wisdom of replacing (and relocating) the highly efficient, large Milton sewage works with its excess capacity whilst so many small works are operated above capacity with these lamentable results.

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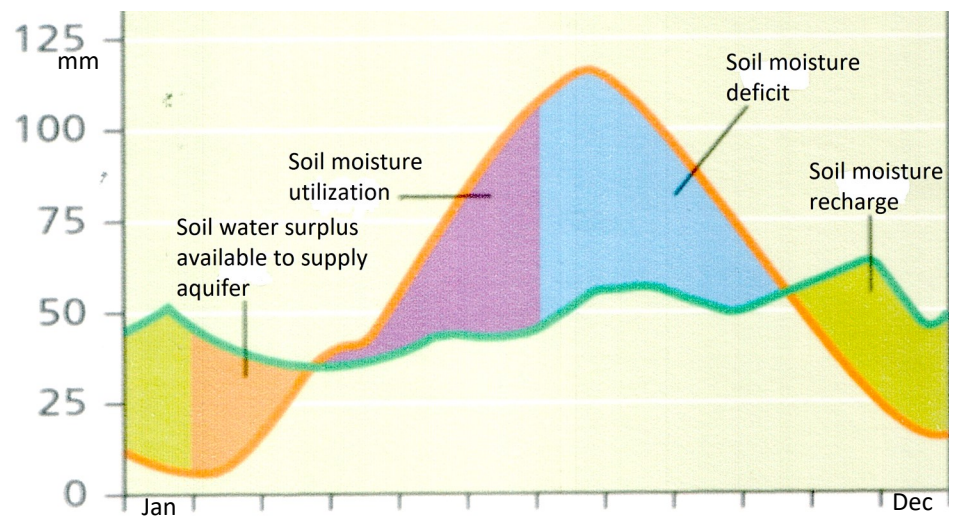
Let not green grass and a few drops of autumnal rain give the impression that all is well in the Valley of the Cam. It is not.

The photograph shows Coldham's Brook, on 23 September, with 'restoration' logs and gravel, bereft. Normally fed by the Cherry Hinton Brook (Newsletter76) it is not clear why the latter barely reaches Coldham's Lane at Sainsbury's, whilst still flowing (feebly) further upstream. This year the more vulnerable Coldham's Brook has dried up altogether much further upstream than usual.



The graph on the right goes some way to clarify why there is no reason to be optimistic and no reward for being patient.

In summer the capacity of the Cam Valley land surface for evapotranspiration greatly exceeds the amount of rainfall (both being measured in mm). In the autumn, rainfall usually exceeds evaporation as temperatures drop. By February soils are sufficiently saturated that surplus water can seep down to the water table and thus replenish the ground water in the aquifer which had earlier been depleted by natural spring flow and over-abstraction due to human rapaciousness.



A year's average 'water balance' graph for a location typical of the Cambridge region. The vertical scale is in mm for both the green rainfall line and the brown line which shows the pattern of potential evapotranspiration. This is the theoretical maximum amount of evaporation from soil plus transpiration from plants.

During a hot dry summer the green line is lower and the brown line higher. Then autumn soil moisture recharge gets off to a bad start. It takes up to 4 months of abundant rainfall to recharge the aquifer, until evapotranspiration takes charge again in the spring.



Tom Bragg



Friends of the Cam

PS

The recent apparitions to the right, on the Cam near Paradise Nature Reserve, have caused puzzlement, discussion, and microscopic scrutiny, without resolution, so far.

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Simon Sagers spreading the word from Shingay-cum-Wendy



Steven Thain

Few are more aware of, and more distressed by, the historic decline in stream flow and water quality. Few are more horrified by the implications of unrestrained urban growth, untrammelled groundwater depletion, and the cavalier disgorging of untreated sewage.

Simon Sagers (on right in top photo) spread the word through CVF members on **their inspirational visit** (10 Aug) to the private 75 acre **Mill River Nature Reserve** in the parish of Shingay-cum-Wendy. The reserve's axial stream flows from Chalk springs, mainly at the Totternhoe Stone level, over a very narrow belt of alluvium resting on Gault Clay. Guests were treated to a rich patchwork of habitats, long stretches of 'restored' channel, and a wetland exemplar, under construction, designed to cleanse the water downstream from Litlington sewage works.

This major project was financed as a spin-off from the contiguous 250 acres of profitable solar panels, shown in the top photograph beyond the parched grass.

Though in more familiar territory our (15 Aug) **Grantchester Walk, led by Michael Goodhart**, was equally heartening. Rob Mungovan was on hand to give convincing behind-the-scenes justification of what we saw of the reinvigorated Byron's Pool fish pass which he designed and implemented (see Newsletter 77, 26 July). The photograph below shows damage to the stream bank (burrows up to 50cms long) in the fish pass, caused by the invasive signal crayfish, which was exposed and repaired.



Rob Mungovan spreading the word from the Granta

DB

Whenever and wherever **Rob Mungovan** can find fish and water he is in his element. A Cambridgeshire native, he grew up in Foxton and, as a boy, roamed local streams and the Fowlmere Reserve, fishing and feasting his eyes on toads and trout; thereafter, year upon year, mile upon mile, he has built up what must be an unsurpassed knowledge of Cam Valley stream channels.

He attended local schools. By the time he entered Hills Road Sixth Form College he was able to coach his new biology teacher (Stephen Tomkins, present Chair of CVF, no less) on the finer features of Chalk streams. Stephen pointed Rob towards environmental science which he pursued at Sussex University at the time of its increasing popularity. His A-level project had dealt with E. coli from the Melbourn sewage works. At Sussex in 1995 he undertook a third year study course entitled, 'The apparent lack of brown trout in a South Cambridgeshire Chalk stream'.

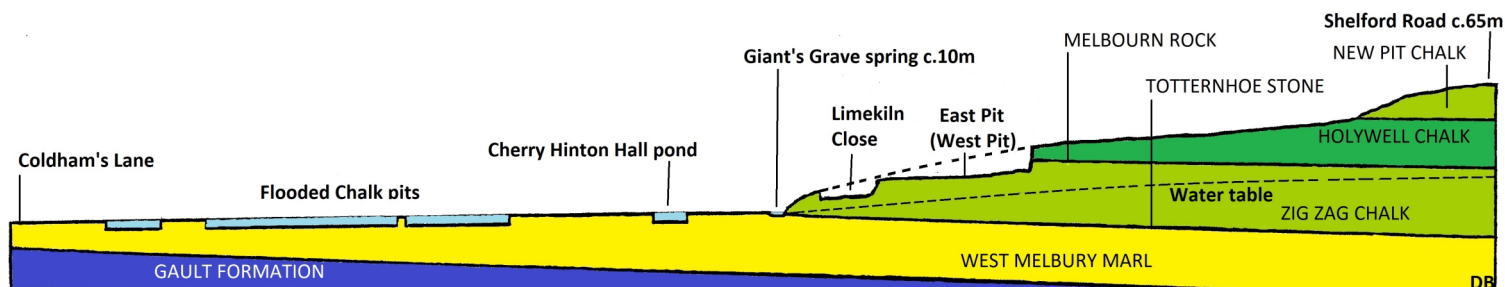
Rob's first employment was to engage in fish surveys on the Frome and Piddle. Excitement, at the time, over native crayfish discoveries, otters, and wild brown trout, made him realise the value of the Cam's Chalk streams. In 2001 he became **South Cambs' first Ecology Officer**. After 16 years he transferred to the **Wild Trout Trust as Conservation Officer East Anglia and Central**, thus extending the area of his responsibilities somewhat. For more than 20 years he has been engaged in all aspects of river channel and floodplain management over many miles of Cam tributaries, encouraging and training voluntary labour, and spreading the word.



Damage by signal crayfish at Byron's Pool

Mike Foley

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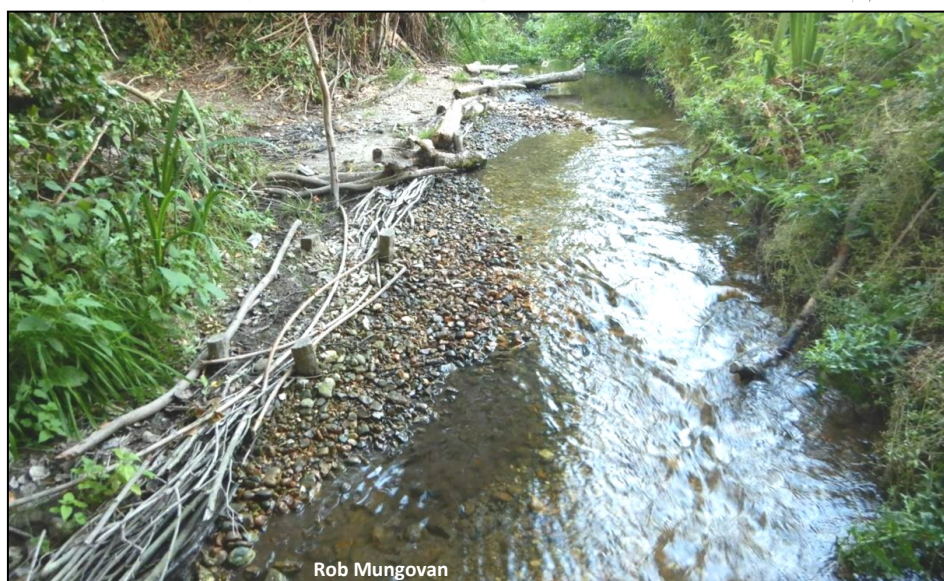
The dire state of our ground water this August will be clear to all our readers. In **Let it Flow!**, two years ago, we suggested a fuller and regular use of hose-pipe bans to help save our streams. We have not got a ban yet.

The sketch cross-section (4kms long) shows the course of the Cherry Hinton Brook across the impermeable Marl. More generally it shows the relationship between geology, surface relief, and hydrology. A spring occurs where the water table intersects the surface, towards which the ground water (under the water table) seeps laterally.

All of Cambridge Water's supply is pumped from ground water which results in the lowering of the water table. Hydrostatic pressure is thus reduced and spring discharges decrease. The Chalk streams suffer. Earlier channel restoration measures in the River Mel at Meldreth (photographed on the 18 July) provide clear evidence of considerable river flow reduction.

The **Environment Agency (EA) Briefing** dated 15 July 2022 stated: 'Importantly, the water companies who supply water in [East Anglia] have assured us that for this summer water will be available without restrictions'. Importantly?.....Importantly?..... Should it not be the role of the EA to protect the Cam's Chalk tributaries from the hose-wielding profligacy of customers?

In its **April 2022 Drought Plan**, Cambridge Water claims that whereas we use 140 litres per day our great grandparents used 18 litres per day. 'While we aim to maintain supplies ... we will also do everything we can to minimise the impact of our actions on the environment'. Its website stated in July 2022 that: 'As is normal, groundwater levels will start to recede in the summer, but with groundwater in the normal range, we do not expect any issues or restrictions later in the year'. Is there not here a tinge of pride in satisfying the habits of improvident customers? Unwillingness to provoke while the Company's house (leaks) is not entirely in order?



It must be admitted that Cambridge Water is between the proverbial rock and a hard place. For example the spring **augmentation scheme** has been operating with mixed results. This is the scheme (see Newsletter 38, 10 May 2017) whereby ground water is pumped to the surface and then transmitted by pipe into the channels of the headwaters of some dozen tributaries of the Cam.

In the case of Hobson's Brook, at **Nine Wells**, the procedure had to be halted for just under two weeks during the July 2022 heatwave when temperatures reached 40°C. During this period the demand for water evidently increased, at times, by up to 35%. So, under these exceptional circumstances, the decision was taken to interrupt augmentation in order that supplies to customers were not interrupted. It is not difficult to see where the Water Company was coming from, when the chips were down.

The CVF is very much in touch with the EA, Cambridge Water (which supplies our water) and Anglian Water (which treats our sewage). At a meeting with Anthony Browne MP (South Cams) on 3 August we challenged the sustainability of the whole *status quo* and again asked him to act on the conviction that, in effect, all new housing developments must not be supplied from the Chalk's groundwater but from sources elsewhere.

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CVF's work continues apace on a wide variety of fronts ranging from its **pollution project** and related liaison with **Anglian Water** to engagement with the **CamEO partnership** not to mention the ever-demanding **battles with invasives**.

The CVF has always worked closely with the **Cam Conservators** and we were pleased to welcome **David Partridge** (photo below), their **newly-appointed River Patrols Officer**, to our recent committee meeting.



As a modern languages graduate David served in the Metropolitan Police and Hertfordshire Constabulary for 34 years ending up as Chief Inspector Operations in Hertfordshire. Recently his responsibilities included leading on threats made to the county's MPs. One of Hertfordshire's MPs is Sir Charles Walker who led the initial parliamentary debate on Hertfordshire's Chalk streams. David's main interests are all forms of angling: including fly fishing as well as scuba diving, kayaking, and wind surfing. So it was but a short step to the River Cam. **The bulk of his work relates to the 1300 craft/vessels on the water.** He hopes to provide help to the small minority of river users who are in breach of regulations where there is scope for constructive engagement, and aims to support vulnerable users through charities such as Wintercomfort.

The fish pass at Byron's Pool has been subjected to radical improvement overseen by the ever-vigilant **Rob Mungovan of the Wild Trout Trust**. Heavy equipment (photo top right) and gravel were used to reduce the gradient of the channel overall and to introduce a carefully graded sequence of pools and riffles. This both makes the pass a more efficient passage for fish as well as an improved habitat. Finishing touches were added



Rob Mungovan



D B

(photo above) by a group of City Council volunteers. Before the water in the old pass was cut off, a rousing 14 different species of fish were rescued, the most numerous being thousands of minnows at the top end. On the face of it this appeared to be good news. However, Rob was surprised that so many species were found in such a poor habitat. So, perhaps the original unsatisfactory fish pass had been acting as a bottleneck.

Near the Coldham's Lane Sainsbury's roundabout (photo below), during our **June Guided Walk** the disappearance of the Cherry Hinton Brook was raptly pondered by members. Other **evening Walks** planned are: Mill River (10 August), Grantchester Meadows and Byron's Pool (15 August), and Caxton Moats (September).



S Thain

Meanwhile, take a look at the Cambridge Water video:
<https://www.youtube.com/watch?v=JtWANUPhxE>

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point where the leakage down into East Drain can be clearly seen and heard. Repairs will presumably be required in perpetuity.

From here the **Brook continues as a dry ditch (wet in parts, April 2022) until it reaches the pipe shown in the photo (left, taken in March 2022) immediately south of the Newmarket Road.** The pipe leads down towards the trees into East Drain. This slope gives the impression that the Brook is on the side of a very shallow valley

Whether or not the little egret (photograph above) managed to consume the bullhead (dear reader, it did), there is no doubt that, taken together, they are an indication that the **ecological health of the Cherry Hinton Brook upstream from Sainsbury's**, flowing over the Marly (clayey) Chalk, could be a great deal worse than it is (even though the EA and Cambridge Water now concede that over-abstraction has reduced its discharge).

Downstream is a very different matter. It flows under the bridge carrying Coldham's Lane. Then the **ravages of the motor car require the stream to disappear** into 100m of miserable tunnel. It reappears from under Barnwell Road becoming Coldham's Brook, crossing the **City's East Main Drain** through a covered aquaduct (in the distance in photo on the right). The Brook re-crosses the Drain near Galfrid Close. These water courses are shown on this [map](#).

Along the edge of Coldham's Common the Brook seeps down through its bed and down swallow holes to the lower level of the parallel Drain. **The Drain can be said to have 'captured' the Brook** which was thus unintentionally sacrificed long ago to the need to protect south-eastern urban Cambridge from flooding. The [Greater Cambridge Chalk Stream Project Report](#) **claims Coldham's Brook as a Chalk stream**. The highlighted (dark blue) water course in its map on page 25 is the East Main Drain, not Coldham's Brook. The map in the [link](#) above also makes the same mistake.

In reality, between the two crossing-points, **Coldham's Brook is a straightened, widened, over-deepened ditch with deep silt and a leaky bottom**. Channel [restoration](#) is currently (winter/summer 2022) in progress. The Brook is in its death-throes (April 2022) at the second crossing-

rather than along its axis (occupied hereabouts by the Drain). It is conceivable that local coprolite quarrying could have modified the micro-relief. Here the drain/brook combo has left the Marly Chalk and flows over the **Gault Clay. The neighbouring (Gray's) clay pit**, flooded in 1949, had been dug to 20m.

North of Newmarket Road the Drain alone flows towards Ditton Meadows where it turns west under the railway, and across a corner of Stourbridge Common to the Cam, carrying unknown quantities of pollutants.



The ends of the two pipes in the above photograph (showing the aquaduct in the distance crossing the Main Drain) have triggered the idea that the Cherry Hinton Brook could be diverted down into East Drain just before it reaches this aquaduct. This arrangement would connect the Cherry Hinton Brook with the Cam, thus enabling fish such as [brown trout](#) to migrate upstream. However, Coldham's Brook, the backbone of [Barnwell West Local Nature Reserve](#), would then dry out altogether and threaten the occurrence of [whorl-grass \(Catabrosa aquatica\)](#), one of the rarest plants in Cambridgeshire, perhaps found now only in this locality, along with other valuable wildlife.

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It was a particular pleasure to welcome members and guests — in the flesh — to our **21st AGM** and Annual Lecture in the spacious and well-ventilated Storey's Field Centre, in Eddington. The event was chaired with his usual flair and charm by **Stephen Tomkins**.



However, a shadow was cast by the **resignation of our Hon. Sec., Alan Woods**, who is leaving the area. In two years he has helped us extend our influence and standing with the EA, water companies, Water Resources East, MPs, and Defra. His numerous consultation responses are exemplars. Sadly, Alan's position on the committee is still vacant, but we now have new blood and we will continue to aspire to Alan's inspirational vision.

As anticipated, the **Annual Lecture, Mike Petty's pursuit of James Plumptre** on his historical 1800 walk up the Cam, was masterly, calling on the extensive range of drawings and documents in the Central Library's Cambridgeshire Collection which is, in itself, one of the products of Mike's life's work. His verve and knowledge held the audience in thrall. His subject offered a stimulating background to the Forum's usual preoccupations with over-abstraction, channel morphology, ecology and pollution. See [here](#).

During the interval there was opportunity to peruse **original drawings by Nevill Willmer founder of the CVF**, recent newsletters, and historic Cam sailing photos displayed by Nick Heath, CVF Hon. Auditor (facing camera, photo above).

Meanwhile, the CVF's engine room is still fuelled by **Mike Foley's determination to discover truth** in relation to the pollution of the Cam and its tributaries. [He addressed the AGM](#) with a succinct, lucid, and informative, illustrated summary of his findings so far. The Anglian Water Company doesn't necessarily come out of the picture smelling of roses. The slides Mike used can be seen [here](#).

Mike's [latest report](#), on phosphate monitoring in the Upper Bourn Brook and its tributaries, dated 8-4-2022,

shows that during the period of sampling, 24 January to 3 March 2022, the vast majority of phosphate measured in the Bourn Brook in the upper catchment originated from the discharged effluent from Bourn sewage treatment works (STW). To understand better the variation in phosphate concentrations over time continuous monitoring will be needed at two selected key locations on the Bourn Brook, since effluent discharges from Bourn STW bio-bubble system are intermittent. Further samples will be taken in July at key locations. See [here](#) also.



Michael Goodhart

On 15 March, **BBC Look East** came to **Sheep's Green**. The programme featured **Mike Foley, Michael Goodhart and Nicky Blanning of Cam Valley Forum, and Robin Price, Director of Quality and Environment at Anglian Water**. The photograph above shows Mike with TV presenter **Nadia Gyane**. He spoke about testing for river pollutants. Michael presented an overview of the need to clean up the river and Robin said that Anglian Water was committed to reducing river pollution and keen to work with CVF to this end. The key theme was river bathing, and eleven all-year-round swimmers enlivened the filming by diving in and describing the joys of wild swimming.

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There is increasing hope that the flailing, indomitable, and even noisy efforts of the CVF and others to subdue **Himalayan Balsam** and **Floating Pennywort** may be gradually taken over by the silent forces of **biological control**, invisible to the casual eye.

CABI reports that there will be “timely field releases of (Argentine) weevils in numbers in 2022” in areas of **Floating Pennywort**. A strain of the **Himalayan Balsam** rust fungus has already been released at more than 50 sites in England and Wales. The results have been “encouraging” but “additional rust strains are required” for it to be more effective. Another invasive species, **New Zealand Pygmyweed (*Crassula helmsii*)**, has also taken a hold in the Cam Valley such as in the headwaters of the Cherry Hinton Brook. A gall-forming mite has been released at 12 sites in England and Wales with promise of success in controlling this pest.

Thanks to **Councillor Katie Thornburrow's** political passion for action the **Greater Cambridge Partnership** (City and South Cambs) has voted for £420,000 to go towards the funding of the Combined Authority's Chalk Stream Project. Lobbying by our own CVF members and other eco-group members undoubtedly increased pressure for action.

Our congratulations to **Rob Mungovan (Wild Trout Trust)** and **Ruth Hawksley (Wildlife Trust)** for their hard work, more than a year ago, on the linked document above. Our thanks also to **Guy Belcher of the City Council** and to **Martin Baker of the Wildlife Trust**. The appendix at the end of the document shows the minimum sum that is required to achieve each element of channel restoration. Now we need to raise the rest of the money from business and elsewhere to complete this work extending it to the 16 stream catchments in the Cam Valley yet to be assessed. If you can help with funding, or know someone who can, please let us know.

A major report by John Lawson has been commissioned by **Defra** and the **CaBA Chalk stream restoration group**: Review of Abstraction as a % of Recharge in Chalk Streams (A%R). The Cam Valley features on page 46.

The objectives are to help understand the scale of over-abstraction from the Chalk aquifer in southern and



With grateful acknowledgement to Kip Loades

Kingfisher and little egret, Cherry Hinton Brook, January 2022

eastern England and to investigate “A%R” as a simple and accessible method for determining acceptable levels of abstraction, not as an alternative to the EA’s present method of environmental flow indicators (EFI), but as a means of independent evaluation. However, we think more work is needed in relation to the Cam. Their analysis is based on a model developed in the Thames region that may not be wholly transferable to our area.

Charles Rangely-Wilson, Chair of CaBA, the catchment-based approach to the study of Chalk streams, is delighted that the CaBA chalk stream hub is now available, answering the need for information and data, enabling those interested to ‘make arguments’ and to ‘join the debate’. ‘By no means yet complete’ it will be developed over ‘a long time to come’.

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Back during the season of mellow fruitfulness, on 30 September 2021, a group of CVF pollution activists visited the **Haslingfield sewage works** run by **Anglian Water**. It is well known to many readers as the nearest sewage treatment works (STW) upstream from Cambridge. The guide was **Ceri Williams** (in orange, photo above), the recently long-term manager of the site. He was fully in tune with the concerns and expertise of the visitors.

If only from press reports the reader will also know of the national perils of **storm overflows** which are an inherent feature of an ancient

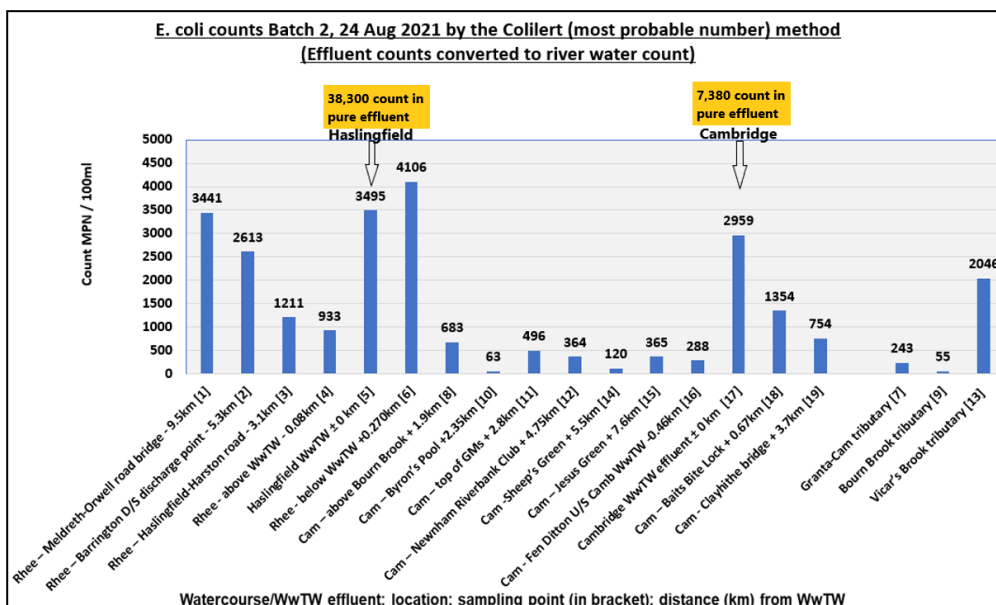


combined sewer system which tries to cope with the combination of sewage and rainfall.

Published data stated that in 2019 Haslingfield was responsible for 88 such events totalling over 1,000 hours duration. These overflows are of sewage mixed with rain runoff which has spent time in settlement tanks, but which is otherwise

untreated. Even in these modern times of increasingly febrile sensitivities so many events of such great total duration seemed unlikely. The visitors could but smile (photo, above) at the monitor probe which had just been deliberately repositioned in September 2021 to ensure that false triggers could no longer happen.

Mike Foley (with blue hand raised in the top photo) is



driving a major **exploration and analysis of the pollution of the Cam and its tributaries**. Anyone with more than a passing interest in the matter should consult his two formidable Reports on the Cam Valley Forum website: **Report 1** (42 pages dated 24 August 2021) and **Report 2** (39 pages dated 1 November 2021).

The graph above is taken from Report 2 and offers a good illustration of data raising as many questions as they answer. What short-term differences would there be due to rainfall? What seasonal differences would there be? Need swimmers and other river users in Cambridge be concerned with what happens at Haslingfield, or even further upriver? Or along Grantchester Meadows? Why are the counts at the Meldreth-Orwell road bridge so high? Is there a myriad of major unknown faecal sources upstream from the road bridge?

On **19 January 2022** a team of volunteers, under Mike's direction, undertook further **sampling at 37 stations** for the **next step in the project**. By summer, after more sampling, patterns of counts should become more apparent, and more of the above questions answered.