Greater Cambridge Chalk Stream Project

Newsletter – July 2025

Reviving Our Rivers Through Evidence, Action and Community

We are pleased to share the bi-monthly update from the Greater Cambridge Chalk Stream Project (GCCSP). We recognise this newsletter is longer than usual. That is intentional. With many complex and interrelated strands of work now underway, we believe it is essential to communicate clearly, transparently, and in detail. The Greater Cambridge Chalk Stream Project is grounded in evidence, not assumption and we welcome critique that is equally well-informed. For those who wish to understand the rationale, data, and decisions shaping our approach, we hope this edition proves both informative and constructive.

Chalk Stream Conference: Reflections and Next Steps

On 16 July, over 100 passionate individuals gathered at Anglia Ruskin University's East Road campus to focus on the future of our precious chalk streams. Our sincere thanks to everyone who attended, and to those who have since contacted the Greater Cambridge Chalk Stream Project to join our citizen science and volunteering efforts. It was inspiring to see such an enthusiastic and diverse audience, with many attendees new to the conversation but keen to contribute to the protection of these often-overlooked freshwater ecosystems.

This event was designed to extend the reach of the chalk stream community, encouraging wider participation and fostering a new generation of engaged local advocates. While Cambridgeshire is fortunate to have several long-established groups already championing chalk stream restoration, we wanted to broaden the conversation and welcome fresh perspectives into this vital work.

The day was energised by curiosity, collaboration, and a shared commitment to restoring our rivers. It also reinforced a critical truth: chalk stream recovery cannot rely on single fixes or individual actors. Instead, progress depends on coordinated action across the catchment, supported by robust evidence, inclusive dialogue, and sustained local stewardship.

We are deeply grateful to Emma and the ARU team for organising such a welcoming event, and to our expert speakers for their generous and thought-provoking contributions. Thanks also to our funders, Cambridge and Peterborough Combined Authority, Cambridge City Council, Anglian Water, and Cambridge Water, whose support enables us to continue this essential outreach.

The conference sessions included:

- **Dr Steve Boreham** (University of Cambridge, retired), who outlined how abstraction, urban growth, and impermeable surfaces are compromising aquifer recharge and chalk stream baseflows, especially for streams like Hobson's Brook.
- **Dr Natalia Balashova** (University of East Anglia), who introduced the concept of nutrient-neutral landscapes, using evidence from the River Wensum to explain how nitrogen and phosphorus travel into watercourses and how targeted interventions can reduce loading.
- **Dr Tory Milner** (Keele University), who spoke on the impacts of fine sediment and turbidity on habitat quality, calling for catchment-wide sediment mitigation strategies rooted in geomorphological understanding.
- **Dr Toby Carter** (ARU), who discussed brown trout spawning requirements and the pressures caused by warming temperatures, pollution, and sedimentation, sharing restoration designs that protect critical spawning gravels.
- **Dr Alvin Helden** (ARU), who explored the role of macroinvertebrates—such as mayflies and caddisflies—as indicators of ecological health and their importance in long-term citizen science programmes.
- **Professor Angela Gurnell**, (Queen Mary University of London) ,who spoke on aquatic plant functions in regulating flow and stabilising sediment, highlighting the ecological significance of restoring light and hydrological variability.
- **Dr Baz Boots** (ARU), who addressed the growing risks from PFAS, microplastics, and heavy metals, calling for expanded monitoring and better regulatory controls.
- **Dr Mike Foley** (Cam Valley Forum), who closed the day with a moving reflection on his own journey as a citizen scientist, showing how volunteer monitoring efforts can expose pollution, influence policy, and build bridges between communities and regulators.

Looking ahead, GCCSP will host a series of focused community events around our case study sites of Linton, Abington, Hobson's Brook, Cherry Hinton Brook, Coldham's Common, and the springheads at Giant's Grave and Nine Wells. These local consultations will present draft restoration plans, share supporting evidence, and invite feedback from residents, landowners, and community groups. Your insight will directly shape our next steps.

We left the conference invigorated by the level of engagement and by the expanding community ready to take action. Restoring chalk streams requires evidence, collaboration, and long-term care, but with growing momentum and shared commitment, the path forward feels more possible than ever.

Introducing the GCCSP Citizen Science Water Quality Monitoring Programme

This newsletter offers the perfect opportunity to update you on the launch of our citizen science water quality monitoring programme at each of our chalk stream case study sites - a cornerstone of the Greater Cambridge Chalk Stream Project. Developed in partnership with Anglia Ruskin University, this initiative empowers local volunteers to collect high-resolution, multi-parameter data, building the evidence base needed for targeted, effective restoration.

Originally planned to begin in June 2025, the programme has been rescheduled to start in **September 2025**. This decision was made to ensure a coordinated and consistent launch, avoiding a fragmented start during the summer holiday period when many volunteers, trainers, laboratory staff, and project team members are away. Beginning in September will allow for proper training, clear communication, and the establishment of well-supported monitoring teams from the outset.

By bringing together scientists and communities, this initiative takes a vital step toward safeguarding the long-term future of our chalk streams.

Why High-Resolution Monitoring Matters: Addressing Gaps in Restoration

Many restoration efforts, including those funded under the Water Industry National Environment Programme (WINEP), emphasise physical outputs, measured in metres of channel or hectares of habitat, while relying on limited water quality data. This risks overlooking the systemic challenges that often determine whether ecological recovery actually occurs.

Without continuous, detailed monitoring:

- Pollution pulses following rainfall go undetected, masking the true state of water quality;
- Oxygen crashes during warm summer nights, thermal spikes during heatwaves, and sediment surges remain invisible;
- Restoration efforts may improve appearance but fail to improve ecological function;
- Catchment-wide pressures remain unmanaged, weakening long-term resilience;
- Adaptive management becomes impossible, limiting our ability to respond to change.


Left: *Sarah, Cambridge Water testing Hanna HI-98594 multiparameter probe to monitor turbidity, temperature, electrical conductivity, pH and dissolved oxygen.* ***Right****: Dr Steve Boreham demonstrates a ThinkSpeak-enabled data logger.*

At GCCSP, we are breaking this cycle by embedding **high-resolution monitoring** into every restoration phase. Success is not just measured by the visible changes we make, but by the recovery of ecological health and integrity.

Parameter	What It Reveals	Critical Ecological Thresholds
Temperature	Groundwater input, shading, climate	Trout spawning fails above 12°C; macroinvertebrates decline above 15–17°C
Dissolved Oxygen	Organic pollution, eutrophication	Below 5 mg/L stresses fish; below 3 mg/L lethal to eggs and fry
Electrical Conductivity	Pollution load	Healthy chalk streams under 500 µS/cm; above 700 µS/cm signals urban/rural inputs
pH	Acid-base balance, ammonia toxicity	Optimal range 7.5 to 8.3; extremes disrupt aquatic biology
Phosphate	Sewage, fertiliser runoff	Above 0.05 mg/L triggers algal blooms and plant shifts
Nitrate	Agricultural runoff, septic systems	Above 1 mg/L promotes eutrophication and aquatic plant loss
Ammonia	Sewage, animal waste	Un-ionised ammonia >0.02 mg/L toxic to fish and invertebrates
Turbidity	Sediment mobilisation, erosion	Water crowfoot declines above 20 NTU; trout spawning impaired above 25 mg/L suspended solids
Flow Rate	Hydrology, abstraction pressure	Flows below 0.15 m/s reduce sediment flushing; above 0.2 m/s support habitat
E. coli	Faecal contamination	High counts indicate pollution, posing ecological and human health risks

Even small deviations from these thresholds can trigger dramatic ecosystem shifts from thriving, sensitive species to communities dominated by pollution-tolerant taxa.

Beyond Water: Monitoring Sediment and Erosion

To complement water chemistry monitoring, we're employing a comprehensive set of sediment and erosion assessment techniques. These allow us to understand how fine sediment moves through the system, affects habitat, and accumulates in sensitive reaches.

These methods include:

- **Deposited and Suspended Sediment Monitoring** – to track fine sediment loads and identify pollution events;
- **Erosion Pins** – to monitor bank erosion rates and seasonal variability;
- **Fixed-Point Photography** – to capture changes in channel shape, banks, and vegetation over time;
- **Laboratory Analysis of Sediment Samples** – to detect chemical and organic pollutants embedded in fine silts.

Citizen scientists will collect sediment samples at each site, enabling detailed lab analysis that strengthens the foundation for science-based decision-making.

Together, these methods build a complete picture of stream health, linking physical habitat changes, sediment sources, water quality parameters, and flow conditions.

Evidence-Informed Restoration Decisions

The River Wensum Restoration Initiative and other peer-reviewed studies highlight that sedimentation remains a leading constraint on chalk stream recovery. For example:

- **Spawning success** of salmonids declines sharply when fine sediment exceeds 10% of substrate volume;
- **Macroinvertebrate diversity** drops in response to oxygen loss, embedded gravels, and sediment-bound pollutants;
- **Storm-driven sediment pulses**, detectable only through event-scale monitoring, can quickly degrade restored habitats.

This scientific understanding is embedded in GCCSP's approach, ensuring that every intervention is supported by rigorous data and reviewed in light of real ecological responses.

Science-Driven Restoration is Non-Negotiable

No chalk stream restoration can be considered effective or sustainable without a comprehensive evidence base. Projects that fail to integrate sediment, water chemistry, and biological monitoring may yield superficial benefits or even cause unintended harm.

That is why GCCSP is committed to setting a higher standard, linking restoration design directly to ecological conditions, long-term data, and transparent evaluation.

Get Involved: Help Monitor Our Rivers

Our recent conference brought together community members, scientists, and decision-makers to explore the urgent challenges facing chalk streams, from sedimentation and nutrient loading to hydrological change and habitat loss.

As part of this, we are now launching our citizen science monitoring programme. This is your opportunity to take part in meaningful environmental action, supporting the recovery of rare and fragile chalk stream ecosystems. Whether you live near Linton, Abington, Hobson's Brook, Cherry Hinton Brook, or Coldham's Common, or simply care about the future of these unique rivers, we invite you to get involved.

- **No prior experience is needed**
- Full training, equipment, and support will be provided by Anglia Ruskin University
- Monitoring begins in September 2025

Your involvement will help generate the robust, real-world data needed to drive adaptive, effective restoration.

To register your interest, email us at:
nature@cambridge.gov.uk

Together, we can ensure that our chalk streams not only survive—but thrive.


Diverse chalk stream habitat, River Granta, Abington Recreation Ground

Habitat Improvements at Our Case Study Sites: Abington, A Reach with Natural Strengths

At Abington Recreation Ground, the River Granta flows through a reach that already demonstrates considerable ecological value. Recent surveys confirm that the streambed supports a naturally diverse substrate: a mosaic of boulders, cobbles, coarse and fine gravels, sands, and silts. This complexity provides a broad range of microhabitats that support many of the species associated with healthy chalk streams.

Importantly, not all chalk stream specialists rely on coarse gravels alone. A variety of invertebrates and some fish species are closely associated with finer sediments, marginal shallows, and organically enriched areas. For example, juvenile stone loach (*Barbatula barbatula*) typically inhabit sandy substrates with gentle flows, favouring particles between 0.063 and 2 millimetres, and gradually transition to gravel beds ranging from 2 to 16 millimetres as they mature. Burrowing mayflies such as *Ephemera danica* are found in clean, oxygen-rich sands, usually under 2 millimetres, where they dig tunnels for feeding and shelter. Case-building caddisflies in the *Limnephilus* genus often occupy silty or vegetated margins, using fine sediments and organic material in areas with slower flows. In contrast, free-living species like *Rhyacophila dorsalis* prefer cold, fast-flowing riffles with coarse substrates above 16 millimetres, where they attach their pupal cases to stable cobbles in highly oxygenated water.

Restoration at Abington will focus on supporting this full spectrum of habitat types. The goal is not only to provide suitable gravels for spawning species, but also to preserve and enhance silty margins, undercut banks, riffles, exposed roots, and low-flow refuges. The ecological resilience of this chalk stream reach lies in its habitat diversity, much of which is already present and functioning well.

The Issue of Colmation

Despite this richness, a key challenge is colmation, the infiltration of fine sediments and organic matter into the gravel bed. This clogs pore spaces, reduces oxygen availability, and impairs the ecological function of the streambed, particularly for species that depend on clean, oxygenated gravels for reproduction and feeding.

In such conditions, adding coarse gravel would not solve the problem. Instead of flushing out fine sediments, imported material could bury them further, reducing permeability and disrupting habitat quality. For this reason, the project will not rely on gravel augmentation.

Restoring Natural Processes

Rather than introducing new material, the restoration will focus on enhancing the river's natural dynamics. Carefully placed in-channel features such as pinned woody debris, brushwood berms, flow deflectors, and localised channel narrowing will help vary flow velocities, mobilise fine sediments, and allow the stream to sort its own substrate naturally.

These measures are designed to improve hydraulic diversity, reduce colmation, create a broader range of habitats for aquatic life, and promote long-term ecological resilience by supporting self-sustaining processes.

Biological Survey Results

In spring 2025, four sites along this reach were surveyed using the Whalley Hawkes Paisley Trigg (WHTP) method. The results confirmed strong ecological condition, with abundance-weighted scores ranging from 78.9 to 112.3, scoring taxa between 14 and 20, and ASPT values from 5.33 to 5.64.

These figures are highly encouraging. In chalk streams, ASPT values above 5.3 indicate high ecological status, with communities dominated by pollution-sensitive species such as mayflies, stoneflies, and caddisflies. A scoring taxa count above 15 reflects strong invertebrate diversity, while WHPT scores over 80 suggest healthy, functionally rich macroinvertebrate assemblages. All four sites at Abington exceeded these benchmarks.

The data strongly supports the decision to avoid gravel importation and instead focus on process-led interventions that build on the reach's existing strengths.

Independent Expertise and Evidence

To ensure the approach is rooted in robust science, the project sought independent advice from Dr Tory Milner, a hydrologist and geomorphologist from Keele University. Her assessment of sediment movement and habitat function has shaped a site-specific design grounded in evidence.

In other areas of Greater Cambridge, gravel augmentation has produced mixed outcomes. Added gravels have washed away, smothered habitats, or failed to integrate with natural flow patterns. These outcomes underscore the importance of careful assessment and a tailored, process-focused restoration strategy.

The updated plans for Abington reflect this understanding. Where gravel is considered in future projects, it must be justified by pre- and post-project data that confirms its ecological value.

Project Team and Community Collaboration

The Abington restoration is being delivered through a partnership. James Anderson and the team at Aquamaintain Ltd are leading on plan development and design. Ruth Hawksley from the Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire is coordinating the practical delivery and liaising with local stakeholders, including Parish Councils and community members.

To address concerns about flood risk, it is important to note that the final design has been developed with full regard for the ecological, geomorphological, and hydrological context. This is a low-impact, process-based approach that enhances biodiversity without increasing flood risk, and which works in harmony with the natural form and function of the river.

Understanding the Role of Gravel in Chalk Stream Restoration

Gravel can play a valuable role in restoration when used appropriately. Its success depends on size, placement, and ecological context. Fine gravels between 4 and 10 millimetres can support fry and invertebrates by creating oxygen-rich pockets. Medium gravels from 10 to 30 millimetres align with spawning needs for species such as brown trout and lamprey, while coarser gravels above 30 millimetres may be suitable for stabilising substrates in higher-energy flows. However, without strong flows to retain them, such additions can become counterproductive.

Introducing gravel into reaches that already have natural structure can disrupt vegetation, sediment transport, and historic channel morphology. In many cases, the most resilient strategy is to let the river sort and distribute its own sediments, creating a dynamic and self-sustaining habitat mosaic.

Letting the River Lead

The Abington case study reminds us that restoration does not always require adding material or making major changes. Sometimes, the most effective strategy is to support what is already working and allow the river to continue doing what it does best.

Next Steps

Finalising the restoration plan at Abington is now a priority. As the River Granta is a designated main river, a Flood Risk Activity Permit from the Environment Agency will be required.

The decision to omit gravel augmentation, coupled with summer staff leave, has led to a short delay. Final plans are now being completed by Aquamaintain and the Wildlife Trust and will be shared with local Parish Councils and the wider community in mid-September 2025.

Progress at Other Sites

At **Linton Pocket Park**, plans for habitat improvement are nearing completion. Cambridgeshire County Council has recommended that the Ordinary Watercourse Consent application be submitted now, with flexibility to adjust designs during the process. Full draft proposals will be shared with the local community by early September.

In **Cambridge City**, Aquamaintain Ltd has completed topographic surveys at Hobson's Brook, Cherry Hinton Brook, Coldham's Brook, and the East Cambridge Main Drain at Coldham's Common. Draft restoration designs are currently in development and will be presented at a series of public consultation events this autumn. These events will offer residents, community groups, and landowners the opportunity to learn more about the proposals, understand the ecological reasoning behind them, and contribute feedback. Event dates will be announced in late August.

In September, **Dr Tory Milner**, hydrologist and geomorphologist from Keele University, will join Aquamaintain to refine in-channel designs. These will be tailored to align with natural processes, ensuring long-term stability and ecological function under real-world conditions. This adaptive design approach will also allow for adjustments based on future monitoring outcomes.

Historic sites where gravel augmentation was previously implemented will also be revisited. With Dr Milner's guidance, these areas will be assessed to evaluate sediment dynamics, gravel stability, and ecological impact. This analysis will help identify opportunities for improvement and ensure that future designs build upon lessons learned.

Measuring Restoration Success

To evaluate the effectiveness of restoration, the project will use a set of evidence-based indicators, including:

- Improved sediment quality and reduced fine sediment clogging
- Greater flow diversity and increased mid-channel sinuosity
- Recovery of aquatic plants and marginal vegetation
- Increased presence of key bioindicator species such as mayflies, caddisflies, and stoneflies
- Reduced bank erosion and improved channel stability

These indicators will be measured through baseline and post-restoration surveys that include assessments of flow, habitat structure, sediment composition, aquatic biodiversity, and water quality. This structured approach ensures transparent decision-making and efficient use of resources.

Spotlight on Cherry Hinton Brook

Restoration efforts at Cherry Hinton Brook are focused on the stretch between Brookside and Sainsbury's. Historic gravel augmentation in this section has resulted in substrates that are too coarse and uniform, leading to the clogging of essential interstitial spaces. These gaps are critical for oxygen flow, invertebrate refuge, and fish spawning, and their loss has reduced ecological function.

Large uniform gravels at Cherry Hinton Brook

The revised design will reprofile and redistribute existing gravels, introduce a more suitable mix of finer gravels and sands, and upgrade or replace existing flow deflectors with more effective, durable features.

These changes are intended to:

- Increase flow velocity and enhance natural sinuosity
- Encourage sediment transport and gravel self-cleaning
- Create more resilient and self-sustaining gravel habitats
- Minimise fine sediment build-up
- Prevent local bank erosion
- Establish aquatic plant shelves to promote ecological diversity and resilience

This site will serve as a practical demonstration of how evidence-based design can restore function and biodiversity to urban chalk streams. It will be closely monitored to inform future restoration work across the city.

Tackling Pollution at Coldham's Common: A Data-Driven Plan for Cleaner Chalk Streams

In response to long-standing concerns about pollution at Coldham's Common and along Coldham's Brook, the Greater Cambridge Chalk Stream Project is working with technical experts to develop a targeted, evidence-led pollution mitigation strategy. These urban, chalk-fed watercourses are currently in poor ecological condition, and the goal is to improve water quality in a way that is measurable, cost-effective, and sustainable.

In April 2025, the project undertook detailed water quality monitoring across Coldham's Brook and the East Cambridge Main Drain. Parameters assessed included nitrate, phosphate, ammonia, dissolved oxygen, conductivity, turbidity, and faecal coliform bacteria. A programme of high-resolution year-round monitoring will begin this autumn to build an even stronger evidence base.

Initial findings revealed multiple areas of concern:

- **Nitrate** levels in Coldham's Brook reached 13.2 milligrams per litre, far exceeding ecological thresholds for chalk streams
- **Faecal coliforms** peaked at 776 colony-forming units per millilitre in the Main Drain, suggesting possible contamination from combined sewers or misconnected drainage
- **Ammonia** was recorded at 0.63 milligrams per litre in the Main Drain, with one tributary reaching 13.56 milligrams per litre—a concentration toxic to aquatic life
- **Phosphate** levels in the Main Drain reached 0.16 milligrams per litre, indicating a risk of eutrophication and algal overgrowth
- **Electrical conductivity** remained elevated, peaking at 1350 microsiemens per centimetre in the tributary, a sign of chronic pollutant input
- **Dissolved oxygen** dropped to 6.59 milligrams per litre (57.8 percent saturation) in the tributary, which is below the healthy threshold for many aquatic species
- **Turbidity** levels, while moderate overall, reached 5.25 Formazin Turbidity Units in the tributary, suggesting sediment-bound pollution

These results confirm that both watercourses are significantly impacted by a complex mix of pollutants, including nutrients, microbial contamination, road runoff, and fine sediment.

To address these issues, the project is going beyond identifying pollutant concentrations. By calculating annual pollutant loads, it is gaining critical insight into the timing, magnitude, and variability of pollution inputs throughout the year. The data sets will be integrated with assessments of flow, sediment dynamics, and landscape features, creating a detailed, site-specific understanding of how water, pollutants, and natural processes interact in the urban environment.

Coldhams Common Water Quality Monitoring Points

Designing Targeted Pollution Mitigation

With this foundation, the project team is designing bespoke interventions that include:

- Constructed wetlands
- Biofiltration systems
- Sediment capture structures

These features are designed to intercept and biologically treat pollutants before they reach vulnerable chalk stream habitats. Rather than applying off-the-shelf solutions, the systems will be tailored to the specific pollutants identified through detailed monitoring.

Key native wetland plants will be used for their ecological effectiveness, including:

- *Phragmites australis* (common reed)
- *Carex elata* (tufted sedge)
- *Juncus effusus* (soft rush)
- *Glyceria maxima* (reed sweet-grass)

These plants are capable of absorbing nitrogen and phosphorus and support microbial communities that perform denitrification, a process that converts nitrates into harmless nitrogen gas. Their ability to tolerate changing flow conditions and nutrient loads makes them particularly suitable for urban chalk stream environments.

In addition to nutrients, these streams are also vulnerable to pollutants such as heavy metals, hydrocarbons, and road salts. These contaminants pose serious risks to sensitive chalk stream species:

- **Mayflies** (*Baetis spp.*, *Ephemera danica*) are highly sensitive to chloride, zinc, and copper
- **Caddisflies** such as *Rhyacophila* and *Hydropsyche* are vulnerable to low oxygen and metal toxicity
- **Stoneflies**, among the most sensitive aquatic invertebrates, quickly disappear from polluted systems
- **Brown trout** (*Salmo trutta*) and **brook lamprey** (*Lampetra planeri*) suffer reduced egg survival and larval health when exposed to high concentrations of metals and chloride

These organisms serve as bioindicators of ecological health, and their presence, or absence, provides a clear signal of environmental quality.

Laying the Groundwork for Long-Term Recovery

Although constructing full-scale pollution control systems lies beyond the current funding scope of GCCSP, the project has already laid critical foundations. It has brought together technical partners, initiated advanced design work, and created a robust data platform to support future investment.

Next steps in this longer-term programme will include:

- Hydrological modelling to optimise design performance
- Continued ecological and chemical monitoring
- Adaptive management to ensure long-term resilience

We thank all residents, partners, and stakeholders for their continued support and patience. Restoring Coldham's Brook and the East Cambridge Main Drain will take time and collaboration, but this work is now firmly underway.

Springhead Protection: Nine Wells and Giant's Grave Update

During June and July 2025, site visits were carried out at Giant's Grave and Nine Wells springheads. These visits brought together the GCCSP, Cambridge City Council Drainage Engineers, Cambridge Water, the Environment Agency, Aquamaintain Ltd, and a team of ecologists and geologists. Trustees from the Hobson's Conduit Trust also joined the visit to Nine Wells, sharing their longstanding expertise in the area.

Giant's Grave Site Meeting July 2025

Giant's Grave: An Urban Springhead Under Pressure

Giant's Grave is one of the most complex and constrained sites in the GCCSP portfolio. Situated in a densely developed area, the springhead is directly impacted by a highways drain outfall, which discharges polluted surface runoff and sediments directly into the stream's source. With limited available space for new infrastructure, the challenge lies not only in the pollution itself but also in the practical limitations of designing and implementing effective mitigation.

To address this, Aquamaintain Ltd has been commissioned to develop a bespoke pollution mitigation system. The solution must be tailored to manage a diverse mix of urban pollutants while remaining feasible and maintainable within the operational and financial capacity of Cambridge City Council. Initial sediment and water quality samples are helping to shape the design, informed by snapshot monitoring carried out in August 2024.

These early results have provided a baseline for planning:

- Nitrate concentrations reached 6 milligrams per litre, which is elevated for a chalk springhead
- Ammonia-N ranged from 0 to 0.02 milligrams per litre, suggesting limited recent organic pollution
- pH was recorded at 7.2, consistent with groundwater-fed systems
- Electrical conductivity measured 735 microsiemens per centimetre, indicating moderate ionic content likely linked to surface water runoff
- Turbidity was zero during dry weather, with no visible suspended sediment

While these values appear relatively moderate, they must be viewed in context. Urban runoff events, particularly after dry periods, can cause sharp increases in pollutant concentrations. These first flushes often deliver the most harmful impacts to sensitive springhead ecosystems.

To better anticipate these risks, GCCSP has drawn lessons from Burwell Spring, a similar chalk springhead affected by urban runoff. Monitoring in July 2025 recorded:

- Runoff temperatures as high as 20°C
- Depressed dissolved oxygen and elevated pH (7.6)
- Turbidity exceeding 100 FTU and suspended solids at 88 milligrams per litre
- Elevated concentrations of ammonia and phosphate
- Severe microbial contamination, with E. coli and coliform counts over 600 colony-forming units per millilitre

This snapshot highlights what may also occur at Giant's Grave during storm events. The lack of dilution capacity, combined with a direct outfall, underscores the need for a robust, integrated mitigation system that can address thermal, chemical, microbial, and sediment-related pressures.

To inform this, **regular water quality monitoring at Giant's Grave will begin in September 2025**. These high-resolution datasets will support the development of more precise and effective mitigation designs, and help determine the scale and type of pollutant uptake required for long-term resilience.

For the system to be effective, it must:

- Function reliably across a range of flow conditions and pollutant loads
- Provide resilience throughout the seasons
- Fit within the site constraints and long-term maintenance plans of the City Council

Nine Wells: Restoring Habitat and Managing Flow

At **Nine Wells**, habitat design is progressing in partnership with **Hobson's Conduit Trust** and **Cambridge Water**. The planned works aim to:

- Reduce organic matter accumulation around the springheads
- Open selected tree canopies to enhance light and promote chalk spring macrophytes
- Install sediment traps and erosion controls to protect water quality
- Improve flow diversity and channel morphology

Cambridge Water also has an Environment Agency requirement under WINEP (Water Industry National Environment Programme) to investigate the operation and triggers of flow augmentation at Nine Wells. Their appointed consultants are developing a detailed programme, including:

- Monitoring within the springheads

- Spot flow measurements
- Integration of telemetry from injection boreholes alongside existing gauge data

Cambridge City Council sediment trapping features installed at Nine Wells using woody debris

Vic Smith, Nature Reserves Officer at Cambridge City Council, has begun installing sediment trapping features using woody debris to support these objectives, and early results show a noticeably cleaner channel. Vic will continue to work closely with Aquamaintain Ltd and Hobson's Conduit Trust to deliver the wider habitat improvement programme at the site.

As with Giant's Grave, designs and evidence for Nine Wells will be released for public consultation, with a local event to facilitate stakeholder feedback and confirm working partnerships with the surrounding community.

Regenerative Farming Demonstration: New Shardelowes Farm

JRH Ltd, a leading national company specialising in rainwater harvesting and water pump systems, has installed a comprehensive guttering network at New Shardelowes Farm to capture rainwater from the 1680m² shed roofs. This water is directed through a filtration system into the water tanks installed earlier this spring. JRH Ltd have also installed the electric pump essential for water movement and management. The piping system to convey excess harvested rainwater into the aquifer recharge site is planned for installation in autumn 2025, following completion of the farm's busy harvesting season.

JRH Ltd installed roof rainwater capture pipe system

Regenerative Farming for Chalk Stream Recovery

In June, GCCSP met with Ed Wombwell, Farm Manager at New Shardelowes and leader of the East Cambridgeshire Farm Cluster, and Helen Bailey, Land Advisor for The Wildlife Trust. Helen will lead on interpretive signage and educational materials, drawing on her close ties with the local farming community.

Regenerative farming is a key part of chalk stream conservation. Although fields at New Shardelowes lie kilometres from the river, their impact is far-reaching. Healthy soils improve infiltration, reduce runoff, and recharge aquifers, leading to cleaner, more stable flows into springheads and streams.

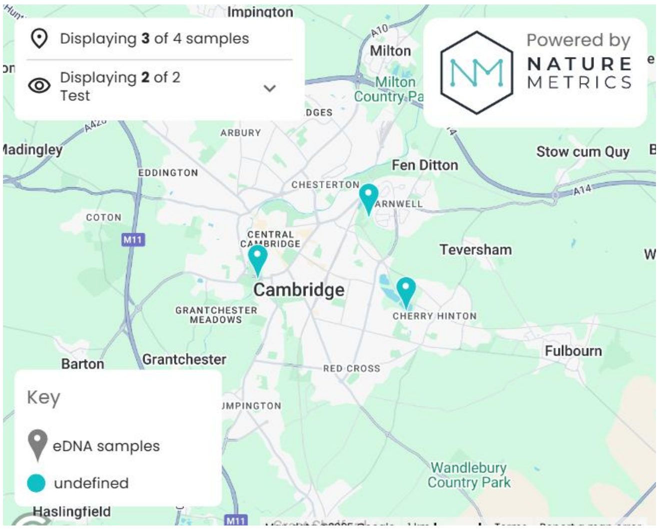
In contrast, intensive agriculture often increases nutrient and sediment runoff. This degrades habitat, smothers gravels, and harms species like brown trout, water crowfoot, and mayflies. Regenerative practices rebuild soil structure and reduce pollution at source, supporting catchment-wide water quality and resilience.

These methods also help manage climate pressures. By storing more water in the landscape, they reduce flood risk and maintain flows during drought. They make farmland more resilient and help safeguard sensitive aquatic ecosystems downstream.

New Shardelowes will become a living laboratory, showing how low-impact farming supports soils, water, and biodiversity. The site will demonstrate how farming and nature recovery can work hand in hand to restore chalk streams from field to aquifer.

Other Updates

Cambridge City Council Edna Surveys



Chalk Stream and Springhead Specialists: Insights from Cambridge City Council eDNA Surveys

The following list presents species identified through environmental DNA (eDNA) surveys commissioned by Cambridge City Council as part of its ongoing work under the Greater Cambridge Chalk Stream Project. These surveys were conducted at four sites to help build a clearer picture of biodiversity within these ecologically sensitive freshwater systems (see sites map above).

eDNA technology allows for the detection of species from water samples by analysing trace genetic material left behind by organisms. This method is particularly valuable in identifying elusive taxa and early life stages of aquatic invertebrates and fish, many of which are critical indicators of water quality and ecological integrity in chalk streams.

This summary of results reflect both typical chalk stream specialists, species with a strong ecological association to the clean, cool, alkaline, and well-oxygenated conditions found in these rare habitats, and springhead specialists that prefer the uniquely stable and cold conditions of spring sources and headwater zones.

Typical Chalk Stream Specialist Species eDNA Surveys

Typical Chalk Stream Specialist Species

Group	Species	Notes
Fish	Brown Trout (Salmo trutta fario)	Iconic chalk stream species requiring clean gravels for spawning
	European Bullhead (Cottus gobio)	Prefers cool, oxygen-rich water with coarse substrates
	Stone Loach (Barbatula barbatula)	Associated with fine gravel and sand habitats
	Spined Loach (Cobitis taenia)	Prefers slow-flowing marginal zones with fine sediments

	European Minnow (Phoxinus phoxinus)	Occurs in clean, shallow riffles with gravels
	Brook lamprey (Lampetra planeri)	clean, well-oxygenated water, with sandy or silty margins, fine gravel patches, and low turbidity
Invertebrates	Baetis rhodani	Key mayfly species in fast-flowing, clean water
	Baetis fuscatus	Another classic chalk stream mayfly
	Ephemera danica	Burrowing mayfly that thrives in clean, sandy beds
	Paraleptophlebia submarginata	Pollution-sensitive mayfly and chalk stream indicator
	Rheocricotopus fuscipes, R. chalybeatus, R. atripes	Midges of clean, oxygen-rich riffle habitats
	Prodiamesa olivacea	Found in well-oxygenated gravel substrates
	Oulimnius tuberculatus	Riffle beetle reliant on clean gravels
	Sialis lutaria	Alderfly preferring unpolluted water
	Limnius volckmari	Riffle beetle associated with cobble/gravel substrata
	Halesus radiatus	Caddisfly found in clear, running water
	Glyphotaelius pellucidus	Sensitive caddisfly of clean, vegetated margins

Springhead and Springbrook Specialist Species

Group	**Species**	**Notes**
Invertebrates	Habrophlebia fusca	Classic springbrook mayfly requiring cool, stable flows
	Centroptilum luteolum	Small mayfly associated with cold headwaters
	Eukiefferiella claripennis	Non-biting midge often linked to chalk spring habitats
	Corynoneura fittkaui	Spring-dwelling chironomid
	Stempellina bausei	Typically found in stable spring conditions
	Thienemanniella majuscula, T. vittata	Chironomids associated with spring environments
	Aulodrilus pluriseta	Oligochaete of spring-fed systems
	Lophopus crystallinus	Freshwater bryozoan typical of clean, nutrient-rich springs

Signal Crayfish (*Pacifastacus leniusculus*) – qPCR eDNA Results

The following table presents qPCR outcomes for four water samples collected across the sites, tested for the presence of Signal Crayfish using a targeted eDNA qPCR assay. All samples passed inhibition quality control checks. Positive scores indicate detection of *P. leniusculus* DNA in the water sample.

Sample ID	**Inhibition QC**	**qPCR Score**	**Result**
CB1	Yes	0	Negative
CHB1	Yes	3	Positive
R1	Yes	12	Positive
VB1	Yes	0	Negative

Interpretation:

- Positive detection at CHB1 and R1 suggests the presence of Signal Crayfish DNA in those locations.
- CB1 and VB1 returned negative results, with no *P. leniusculus* DNA detected at the time of sampling.
- A qPCR score of 3 or higher is considered a confident positive detection based on current assay validation thresholds.

Patchwork Village Education Ponds

In late August and early September work will focus on profiling the wildlife ponds and establishing the plants.

Next Steps for the GCCSP

- From September 2025 Training communities in water quality sampling, fixed-point photography, sediment trapping, erosion pins
- From October 2025 Publish monthly summaries of weekly water quality data, including logger outputs

External Links:

- **Pollution Watch** UK Public platform tracking verified pollution from sewer overflows

  https://pollutionwatch.org.uk/

- **Norfolk Community Biodiversity Awards** Celebrates individuals and community groups across Norfolk making practical contributions to nature recovery, including work on water and wetland habitats.
  https://norfolkbiodiversity.org/the-2025-community-biodiversity-awards/

- **Cam Catchment Partnership** A voluntary partnership promoting collaboration on water and land management in the River Cam catchment.
  https://www.rivercam.org.uk/