

## **Turbidity of the Cam and Rhee. Update Report**



**Mike Foley**  
**31 March 2025**

## Summary

**We are concerned about the murkiness or ‘turbidity’ of our Chalk streams, especially the Rivers Rhee and Cam. This contributes to reduced aquatic life and biodiversity, so Mike Foley and others have been investigating this since 2021.**

**As discussed below, our current view is that the cause is partly geological and partly activity by the non-native invasive American Signal Crayfish. We are confident that it is neither due to algae blooms, nor due to sewage discharge.**

## Update Report.

Cam Valley Forum and associates are concerned about the murkiness - ‘turbidity’ - of our Chalk streams, especially the Rivers Rhee and Cam, because it is a problem contributing to reduced aquatic life and biodiversity.

We are also concerned that high turbidity has been shown by Dr Steve Boreham of WildReach to drastically reduce the ability of natural ultraviolet radiation from sunlight to penetrate into the water column. UV light is a natural disinfectant, but only if it can penetrate well into the water. The ability of the river to self-cleanse itself of viral and bacterial gut organisms harmful to humans arising from, for instance, treated sewage, misconnected pipes and wild sources is thus likely to be impaired. This is particularly pertinent in the stretch of the Rhee and Cam downstream from the Haslingfield Sewage Treatment works to Cambridge’s Sheep’s Green

The high turbidity, and related poor UV transmission, is a likely contributing cause of the “Poor” Bathing Water quality at Sheep’s Green.

The Cam flowing through Cambridge often appears ‘murky’ or turbid, sometimes horribly so. For years, Cam Valley Forum has remarked that this is a poor condition for a ‘Chalk stream’ to be in. In fact, high turbidity is detrimental to aquatic life – to fish, invertebrates, also plants such as Water Crowfoot and several other plants that we want to see flourishing in the Cam but have been sadly declining or absent. Historic high levels of phosphate and nitrate add to the malaise.

During periods of high rainfall we note that our larger rivers become faster, deeper and swollen as they receive extra water from innumerable inflows. They take on a brown colour due to suspended soil which arises from runoff from the land, erosion of the banks, and resuspension of sediment in the bed. None of the rivers are spared, but this occurs mostly during the winter months. This type of turbidity is well-known and understood.

However, in recent years there have been changes to the seasonal pattern of turbidity. We are increasingly alarmed by long periods in summer when turbidity is high, which bodes no good for aquatic life.

This can occur in the absence of high rainfall or indeed in the prolonged absence of any high rainfall such as in the drought period of 2022. Summer is a period when aquatic life is in full-swing, and when it is important for Chalk-stream plant species growing on the river bed to receive sufficient sunlight to try to compete with tougher, over-vigorous larger plants such as Unbranched Bur-reed and the frequent algal mats that cover the river bed. Summer turbidity used to be mostly confined to the Rhee, but recently the lower part of the Cam at Hauxton also shows similar problems.

There seems to be no link to physical factors such pH, electrical conductivity, dissolved oxygen, or concentrations of the inorganic chemical nutrients orthophosphate and nitrate. Sampling treated effluent from sewage treatment works shows that its turbidity is not worse than that of a turbid river, and in fact effluent can be **much clearer**.

In some rivers elsewhere in England and Wales also with problems of turbidity, algal blooms have been implicated. We’ve tested the Cam catchment with a meter designed to detect unicellular green algae and we are confident they are not the cause.

The cause of the summer turbidity is considered, by Mike Foley and a growing body of organisations, to be part-geological and part-activity by the non-native invasive American Signal Crayfish. The soil of the Rhee catchment and some tributaries such the Mill River is particularly clayey consisting of the Gault Formation. This consists of particles so fine that once in suspension they cloud the water. The Environmental Agency has come to a similar conclusion. Further studies are needed on the upper Rhee, where turbidity can be high yet it is still unlikely that American Signal Crayfish has established sufficiently to be a problem. Historic dredging of the Rhee, to avoid flooding of arable land, has probably contributed to the problem, however as the Environment Agency has remarked, no dredging has been undertaken by the Environment Agency on the River Rhee at Harston from 2005. Harston currently can be particularly turbid.

There seems to be no end to the explosive population growth of the American Signal Crayfish in our rivers. Crayfish are 'habitat engineers'. They burrow into banks, the tunnels are sometimes more than 50cm deep. The banks then become more vulnerable to erosion and even collapse. They are active on the river bed and churn up sediment as they move about and in their quest to feed, sometimes on their own kind as they are cannibalistic. They feed on fish eggs and some invertebrates and are most unwelcome in our rivers. They are marching inexorably upriver and we are concerned but there is nothing we can do other than to put in barriers of very fine mesh, which is totally impractical to protect uncolonized river stretches. They can even walk across land. A large male American Signal Crayfish was even seen by a member of Haslingfield Parish Council on their Skate Park! We are unsure how many have now colonised the upper reaches of our main rivers but lower down there may be many tens of thousands.

Robert Martyr of Cambridge City Council and organiser of the Greater Cambridge Chalk Stream Project is fully aware of the importance of clear water in a Chalk Stream and is taking on board the need to monitor turbidity in his project. Dr Steve Boreham, local ecologist and geologist (Wildreach) is also involved, and has contributed greatly to our understanding of what suspended solids are made of in the water, and how penetration by UV radiation can be severely attenuated in high turbidity conditions.

## Photographs

**American Signal Crayfish burrows, on the Granta near Trumpington Meadows. 31/07/24**



**Upper Rhee – high turbidity at Potton Road, near Guilden Morden, 03/08/22 Note the colour of the bank soil, and the severe erosion.**



**Rhee – high turbidity at Malton Farm, 01/08/22, American Signal Crayfish known to be present**



**Rhee - turbidity high at BOOT, Boot Lane footbridge, Barrington, below Barrington weir,  
06/10/22**



**Clearer water exiting the Essex Cam+Granta at Hauxton Junction, mixed flow is to left (Rhee flow from lower right)**



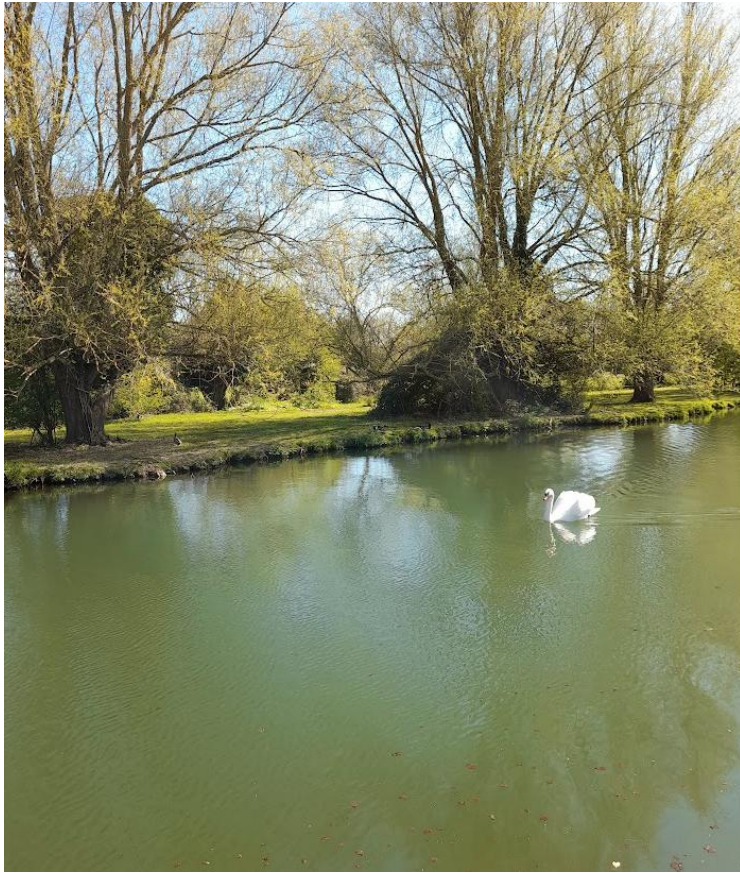
**Cam, upstream of weir at Byron's Pool, 28/07/21. Substantial amounts of benthic filamentous algal growth, more easily seen in the shallower area nearer bank**



**Sheep's Green 23/04/21, background colour deceptively alters water colour**



**Sheep's Green 23/04/21 one minute earlier than above, angled towards sun, apparent colour difference**



**Cam - low turbidity Horningsea-Clayhithe 05/08/22**

