

Monitoring water quality at Little Stoke

You know that the water quality in English rivers is increasingly problematic and the media has given this issue increasing coverage. It is now a hot potato and will be a general election issue.

Much of the reason for this increased public awareness has been the work of citizen scientists, charities, pressure groups, environmental groups and the angling community all of which have collected data to demonstrate the real impact of the appalling practices of water companies and of some in the farming community whose actions range from the reckless to the illegal.

In the Spring of 2022 The Angling Trust (AT) launched a pilot trail on the Severn, getting local clubs to commit to regular data collection from collected Severn water samples. The Severn was chosen because it is a long and well fished river, and what data there was in the public domain, showed it was subject to most recorded sewage 'spillages' in recent years.

In July and August 2022 the AT extended this pilot nationally and HPoWAS was one of the first clubs to commit to the national data collection rollout in September 2022 from Little Stoke (just downstream from Benson where discharges from Crowmarsh Gifford, Benson and upstream at Oxford were 'significant'.)

The testing records prevailing conditions at the time of the sample (weather, flow, evidence – if any - of algal blooms or pollution, whether there has been rain in the previous 24 hours because of water companies claims that many 'spillages' occur because the infrastructure cannot cope with excess rain and 'spillages' prevent more severe impacts like sewage backing up into domestic dwellings), and must be from a consistent location.

Untreated sewage contains significantly raised phosphate (P) and raised nitrate (N) levels. Both of these substances lead to eutrophication (the process in which a body of water becomes over enriched with nutrients leading to plentiful growth of simple plant life, e.g. algae and silk weed, which if unchecked denies light penetration, depletes oxygen and chokes beneficial plant life and thereby degrades the ecosystem and threatens invertebrate and ultimately fish life). Agricultural fertiliser run off raises both nitrate and phosphate but has a greater impact on nitrate levels. Observations should also record any evidence of sewage fungus; a soft khaki coloured coating visible over gravels, which kills invertebrate life and degrades important spawning areas. Little Stoke has few observable gravels for inspection so none is recorded but this does not mean that the water is free of this.

The sample testing reveals nitrate and phosphate levels in the sample taken. We also measure electrical conductivity, (EC) which in itself indicates the presence of unidentified dissolved salts in the sample. The higher the reading, the more of these salts the sample contains. However a chalk stream (a natural and uniquely healthy habitat supporting a wealth of plant, invertebrate and fish) will have much higher natural EC levels than say the Bedfordshire Ouse running as it does over clay. High EC levels are not in themselves bad, but big variations from a consistently sampled area are an indication of substances periodically introduced into the water.

We have reproduced below the raw test results for N, P and EC from Little Stoke since the first test in September 2022. We will add new data as it becomes available so that members can see trends and have early warning of changes that will impact our stretch of river. This is followed by some brief notes so that the significance of this data is apparent.

<u>Sample date</u>	<u>EC level</u>	<u>P level</u>	<u>N level</u>	<u>Overall status</u>
11.9.22 16.30	835	0.66	2.0	Average/Poor
2.12.22 10.52	697	0.56	2.0	Average/Poor
28.5.23 13.05	693	0.37	2.0	Average
8.6.23 13.10	674	0.57	2.0	Average/Poor
22.7.23 08.34	695	0.84	2.0	Suggests recent and repeated sewage discharges from mid July to mid October 23
27.8.23 09.16	616	1.06	2.0	
8.10.23 16.15	703	0.96	2.0	
31.10.23 10.27	649	0.67	2.0	Average/Poor
3.12.23 08.45	714	0.33	2.0	Average.
26.1.24 10.31	659	0.32	2.0	Period of lower sewage discharges suggested from early Dec 23 to early March 24.
8.3.24 10.29	618	0.16	2.0	However we know of a lengthy discharge event at Benson 4-5 March 24

Overall observations

- **Nitrate** levels consistent. As most excess nitrate comes from fertiliser run offs it suggests that farms upstream generally have good practices. The average level (2) suggests elevated levels, but not excessively so.
- **Phosphate** variable. Most phosphate comes from untreated/partially treated sewage suggesting periodic spills affecting the water. We know from publicly available data that Benson/Crowmarsh Gifford discharged for a total of 1000 hours in 2021 and the same in 2022. Each site is unique as the natural underlying phosphate status varies according to rock type, site alkalinity and altitude. In general a reading under 0.3 is good; above this it is poor. Most of the readings are poor, and the average puts it firmly in the poor category.
- **EC** is measured in micro siemens per centimetre (don't worry I don't understand this either). In itself the reading is neither bad nor good, but the higher the reading the more the presence of dissolved salts in the sample, which may be harmful. Melted snow is > 42, rivers on average in the range 50 -1500 and chalk stream 100 - 2000. The variation however is significant with a highest reading of 835 and a lowest of 616, and most in the range 616 – 714, averaging around 675, which puts it squarely in the expected range.

Nationally the AT WQMN (Water Quality Management Network) project at 31.3.24

20 months into the national rollout, the AT now has over 700 volunteers representing over 250 angling clubs, covering 201 rivers and 67 catchments. Over 5000 samples collected.

35% of samples show excess phosphate (our own included on average levels), 43% showing excess nitrate (our own is elevated not excessive). 24% - just under a quarter of samples, show both excess nitrate and excess phosphate.