WSA Wye Catchment Water Monitoring

Update July/August 2021

Long Term Temperature Monitoring

We are now about to enter the final year of our five year natal stream temperature monitoring project. In the next few months our volunteers will be visiting each of our 19 remaining temperature loggers to download the fourth years data and relocate them for their final years continuous data recording. Data from these loggers, along with air and water data previously collected, will be used by WSA to study the impact of climate on juvenile salmonid recruitment. The data will also be used for post graduate studies at Cardiff University into the impact of climate change on the flora and fauna of the Wye Catchment. Six of the loggers are located in various sections of the main river and we will be studying the information they provide in particular in relation to the recent high water temperatures and salmon mortality. More later in the year.

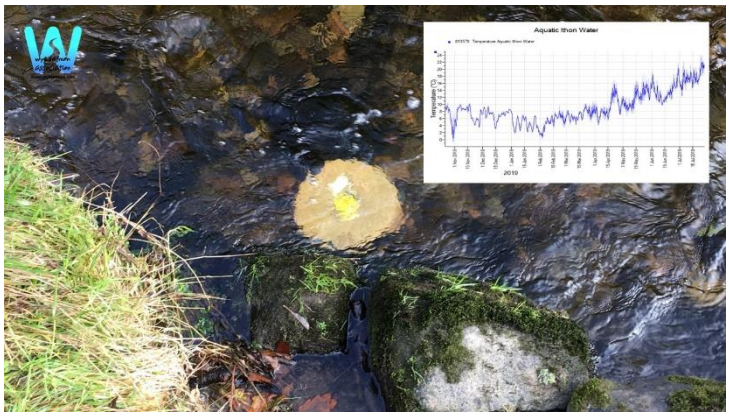


Figure 1: Temperature logger insitu in natal stream and typical graphical results

Water Quality and Phosphate Monitoring.

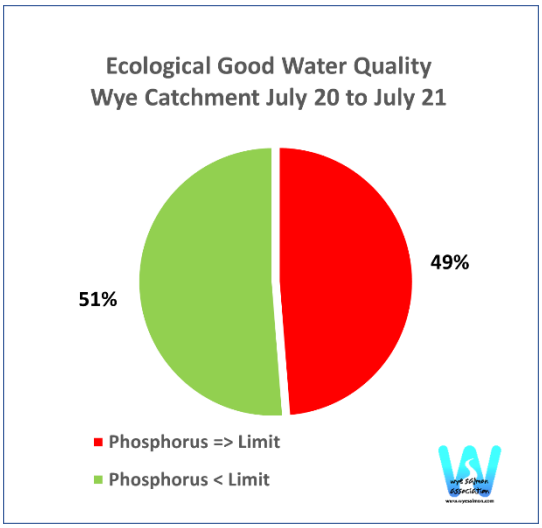
It is now12 months since we began sampling Phosphate (PO4) levels. In addition we are now monitoring EC/TDS, pH, ammonia, nitrate and temperature in selected locations.

Our volunteer force has grown, with members of organisations such as Monmouth Rowing Club, Friends of the Dore, Monmouth AC, Llandrindod Wells AA and Irfon Fly Fishers joining our volunteer team. To date we have now taken some 730 samples at 61 locations in the river & tributaries. You can see an interactive map listing our coverage and monitoring taking place at WSA

Figure 2: Volunteers from Monmouth Rowing Club

Monitoring Interactive Map. Further detail of results for other water quality data in graphical form can be seen on our website at www.wyesalmon.com.

Our team of volunteers, led by Team Leader David Wilkins, has grown to 41 with the addition of monitoring the main river at Monmouth, Redbrook, Symonds Yat and tributaries and streams such as the Monnow, Dore, Trothy, Garran Brook and the Olchan a tributary of the Monnow. We have also extended our monitoring on the Ithon to include ammonia and nitrate, supported by members of Llandrindod Wells AA and Ithon Flyfishers.



WSA is self-funded having received a number of very generous donations from within our membership, we thank them for that. This has allowed us to provide all of our volunteers with initial kit and ongoing consumables. and are providing equipment and training to other smaller organisations interested in joining the citizens science initiative. All the data from these activities is being logged via a phone app to an open-source database.

We and our associates are using the data gathered in a number of ways in pursuit of improving water quality. Data from main river at Ross is being used to provide press coverage and assist Ross Anglers in their pursuit of action.

We have met Dwr Cymru, raising the issue of the poor water quality, both phosphate and e-coli at Monmouth STW and pollution being experienced at Fawley. No action yet but we are due to meet again on the river in mid-August and will be armed with further data gathering to support our concerns over the outflows from STWs.

Our data is are also being shared with the Chair of Nutrient Management Board and NRW and EA. Some of our data has also been used and quoted in objections to planning applications in Herefordshire, one draining to the Garran Brook, our recent monitoring suggesting phosphate levels in this watercourse may be exceeding good water quality thresholds.

WSA member and volunteer Morgan Jones demonstrated the use of the Hanna Digital phosphate tester and e-coli testing, showing the poor results being seen below Monmouth STW, on the George Monbiot Rivercide TV documentary and Patricia Carswell from Monmouth RC explained our citizens science approach on BBC Midlands news recently.

We continue to work together with our fellow citizens science groups within the Cardiff University initiative. Environmental groups such as, Friends of the Upper Wye [FoUW], Campaign for the Protection of Rural Wales (CPRW) and Friends of the Lugg (FoL) as well as NRW, EA and WUF. We are in close contact with several national angling and environmental action bodies sharing information to publicise the impact of these data on water quality and working closely with Gwent Angling Society members.

Figure 3: Green algae observed in the main river at Ballingham on 29th July

In the past, the Wye has depended on flushes of clean water coming down from the Welsh uplands to clean it out, in summer especially. There has always been a certain amount of algal growth in the river in the hotter months but had not reached crisis proportions because of these regular pushes of cleansing water.

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Despite the damage other factors have contributed, at the moment, what is killing the Wye, and we use the words carefully, is the appalling decline in water quality. Until this is addressed, every other issue fades into relative insignificance.

The green algal bloom, seen in fig 3 was evident between Hereford and the estuary during week commencing 26th July. Looking at live data on the National River Flow Archive website WSA member Gordon Green noted mean flow for the Wye at Belmont is ~50 m3/s, for the Lugg ~10 m3/s. So, water passing Fawley and Ross is about 15% Lugg at average flows. Current values were ~8 m3/s at Belmont and ~4 m3/s on the Lugg. In dry weather the less 'flashy' Lugg makes up over 30% of the water passing Fawley and Ross. His conclusion being, even before we consider the seasonality of phosphate levels, we have a 2x reduction in Lugg dilution at the present time. This may well go some way to explaining the bloom shown and the huge increase on recent Fawley phosphate readings compared to autumn-spring data. Another issue to be investigated.

Wye Salmon Association is passionate about change. We now have a huge amount of information over a whole range of data. Data with which NRW and the EA can be confronted and forced to face facts, to accept that mistakes have been made and to start putting the evident wrongs right.

The almost complete decline in Ranunculus beds as a result of sky high phosphate levels also led to the deaths of many, if not most, cygnets on the river in 2020. In 2021, very few adults have even made nests or laid eggs at all this year..

On an ecological front, a PhD student based at Cardiff University, researching potential effects of land use on dippers and grey wagtails, birds that have experienced steady declines in rural areas in recent decades, will be using WSA data as part of her study into river invertebrate diversity and abundance. There is a lot of overlap in our interests, as salmonids are affected by water quality and invertebrate prey availability, so perhaps some more useful research in our pursuit of salmon recovery.

Complementing this work are a number of technical papers produced for WSA by Dave Collins Vice Chair of Gwent Angling Society. These, along with NRW Compliance Assessment Report and the reference paper on phosphate measurement in rivers by Jarvie et al, can be seen at links provided below.

Report of WSA phosphate sampling between July 2020 and July 2021 on the River Wye at Glasbury and in the Llynfi catchment

[Sampling for phosphate and ammoniacal nitrogen on the Powys Llynfi and on the Wye at Glasbury]

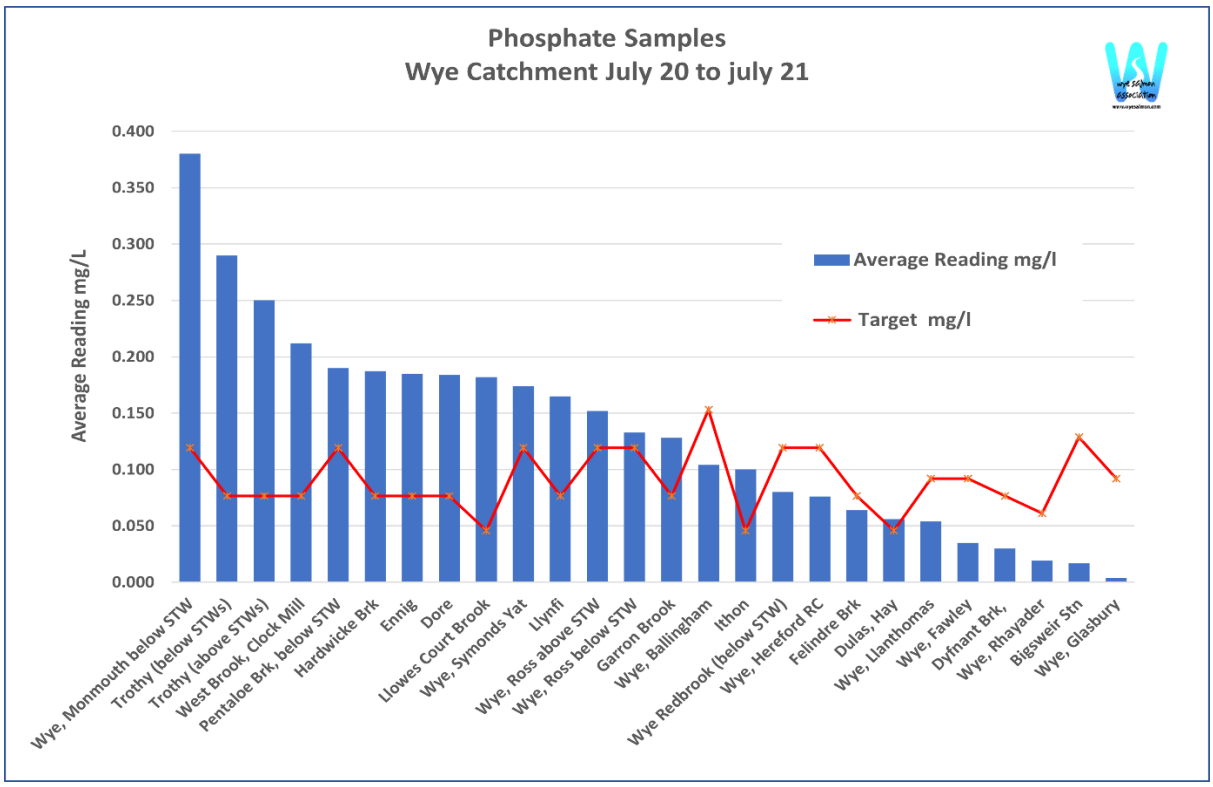
[Review of robust measurement of phosphorus in river....Jarvie et al 2002]

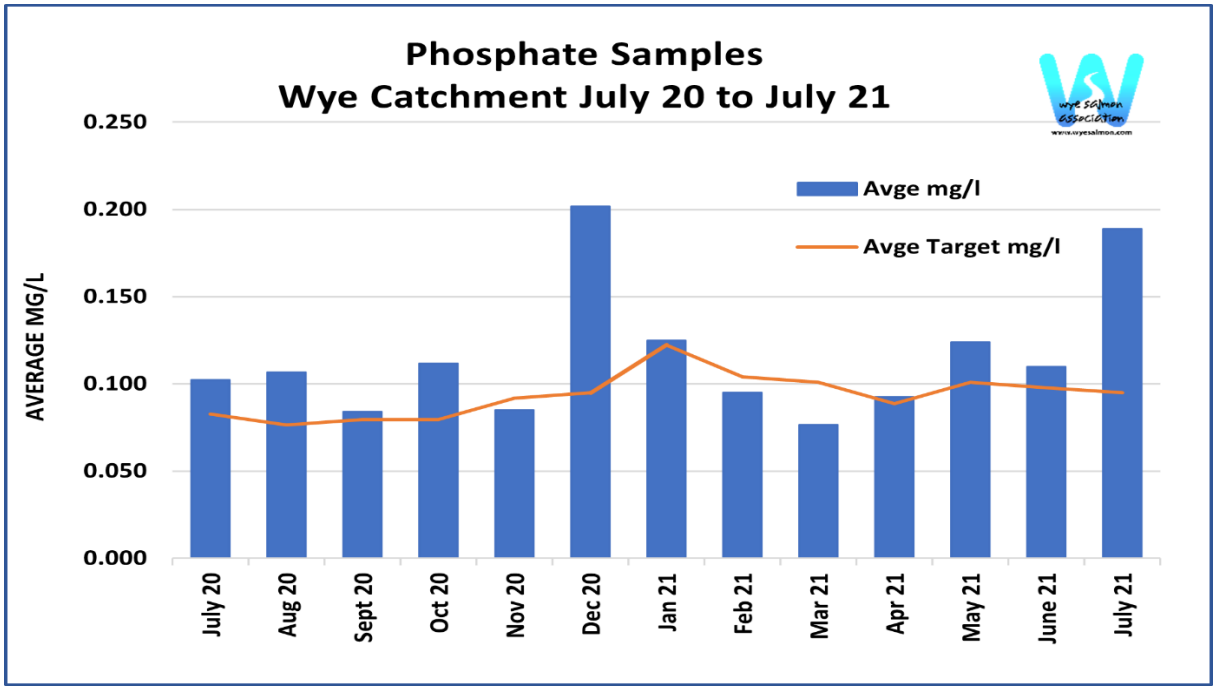
[NRW Compliance Assessment Report of Welsh SACs against Phosphorus targets]

[Phosphate testing comparing Hanna Colorimeter & Lamotte test strip results]

[Summary of a comparison of data from Hanna HI-713 low range phosphate checker and Lamotte Insta-TEST 0 - 2500ppb phosphate test strips]

Stuart Smith
WSA




Phosphate Samples
Wye Catchment July 20 to July 21
AVERAGE MG/L
0.250
0.200
0.150
0.100
0.050
0.000
Avge mg/l
Avge Target mg/l
July 20
Aug 20
Sept 20
Oct 20
Nov 20
Dec 20
Jan 21
Feb 21
Mar 21
Apr 21
May 21
June 21
July 21