

## WESTCOUNTRY RIVERS TRUST CITIZEN SCIENCE



## MONITORING OF THE PAR RIVER AND ITS TRIBUTARIES

The monitoring group operates under the citizen science scheme run by the Westcountry Rivers Trust. The Friends of Luxulyan Valley, The Friends of Par Beach, and the G7 Legacy Project for Nature Recovery have helped. Comments and opinions in this report are not necessarily shared by these organisations.

# MARCH 2023

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### **A. KEY POINTS FROM WRT CSI MONITORING IN MARCH 2023**

1. River levels were high with a very fast flow.
2. Par Beach slipway once again had a high reading for Total Dissolved Solids and Turbidity.
3. Phosphate levels were High at 4 sites on the main Par River (ranging from 300-500 PPB) and only just OK (100PPB) at Polmear.
4. The high water levels meant that evidence for otters was only found at one location.

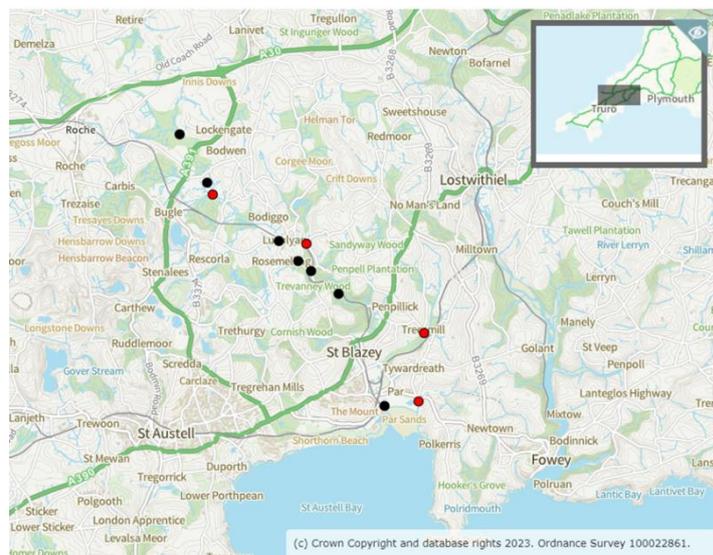
## B. OUR GROUP

Monitoring is part of the Citizen Science programme run by the West Country Rivers Trust (WCRT) and is carried out monthly by volunteers, including Dave Burrell; Joan Farmer; Veronica Jones; Sue Perry; Roger Smith; Simon Tagney; Maggie Tagney; and Brian Harrison. They have received training from Lydia Ashworth, Junior Evidence and Engagement Officer of the West Country Rivers Trust (<https://wrt.org.uk/project/become-a-citizen-scientist/>). Results are logged on the Cartographer website. The support and advice given by Ross Tonkin, Chloe Lake, David Edwards, Claire and Gary Phillips, Jenny Heskett, Nick Taylor, Jeremy Roberts, Mat Bateman, Colin Pringle, Matt Healey, Simon Browning, Lydia Deacon, Layla Ousley, Jack Middleton and Nicola Rogers is greatly appreciated. The interest and encouragement offered by Environment Agency officers, especially Lisa Best, Lisa Goodall and Peter Scobie, have been invaluable.

## C. MARCH 2023 MONITORING POINTS

This month monitoring occurred at 11 locations. Monitoring points along the main Par River are shown in black. Those in red are on tributaries.

**Source:** <https://magic.defra.gov.uk/MagicMap.aspx>



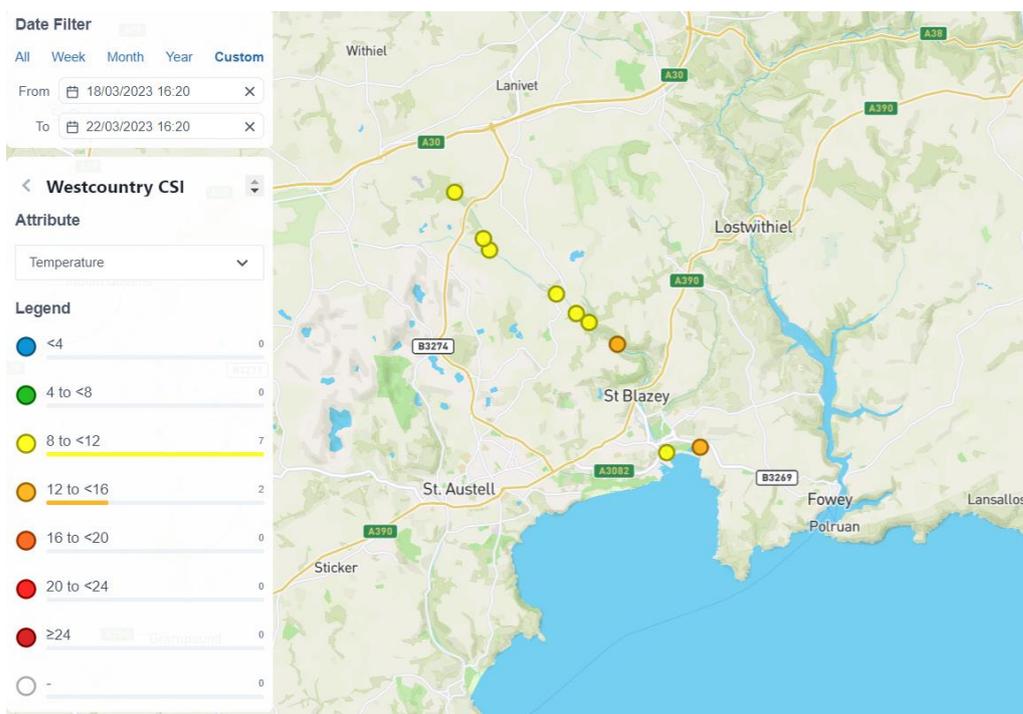
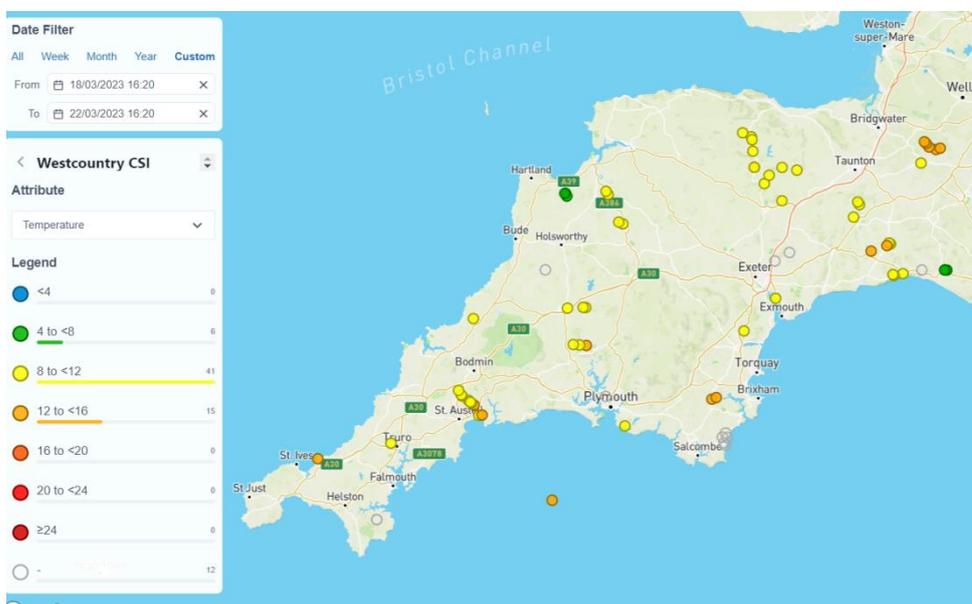
<b>LOCATION</b>	<b>DATE</b>	<b>TYPE OF CHECK</b>	<b>MONITORED BY</b>
<b>Criggan Moors, Par River, SX 01882 61133</b>	22/3/2023	CSI sample & Cartographer record.	Roger Smith
<b>South of Minorca Lane, Par River, SX02668 59747</b>	22/3/2023	CSI sampling. Cartographer record.	Roger Smith
<b>Carbis Stream SX 02834 59401</b>	22/3/2023	CSI sampling. Cartographer record.	Roger Smith
<b>Luxulyan allotments, Par River, SX 04732 58045</b>	22/3/2023	CSI sampling. Cartographer record.	Dave Burrell, Joan Farmer, Veronica Jones, Roger Smith
<b>Cam Bridges, Par River, SX 05292 57454</b>	22/3/2023	CSI sampling. Cartographer record.	Dave Burrell, Joan Farmer, Veronica Jones, Roger Smith
<b>Gatty's Bridge, Bokiddick Stream SX 05531 57953</b>	22/3/2023	CSI sampling. Cartographer record.	Dave Burrell, Joan Farmer, Roger Smith
<b>Treffry Viaduct, Par River, SX 05650 57179</b>	22/3/2023	CSI sampling. Cartographer record.	Dave Burrell, Joan Farmer, Roger Smith
<b>Lady Rashleigh Mine, Par River, SX 06451 56509</b>	22/3/2023	CSI sampling. Cartographer record. Bacteria sample.	Dave Burrell, Joan Farmer, Veronica Jones, Roger Smith
<b>Treesmill, Tywardreath Stream, SX 08873 55385</b>	18/3/2023	CSI sampling. Cartographer record.	Maggie Tagney
<b>Par Beach slipway, SX 0776 53261</b>	22/3/2023	CSI sampling. Cartographer record.	Brian Harrisson
<b>Polmear Stream, Ship Inn SX 08749 53417</b>	18/3/2023	CSI sampling. Cartographer record.	Simon Tagney

## D. TEMPERATURE

1. This is the WRT's explanation of why this is monitored:

*Temperature is a vital parameter within the river ecosystem. It controls many of the aquatic species life cycles. Temperature fluctuates with the seasons; however, you do get variation within that, particularly in small rivers and streams. Another important reason to measure temperature is to track the impact of our warming climate on our waterbodies.*

2. **Geographical comparison.** Source: Cartographer.



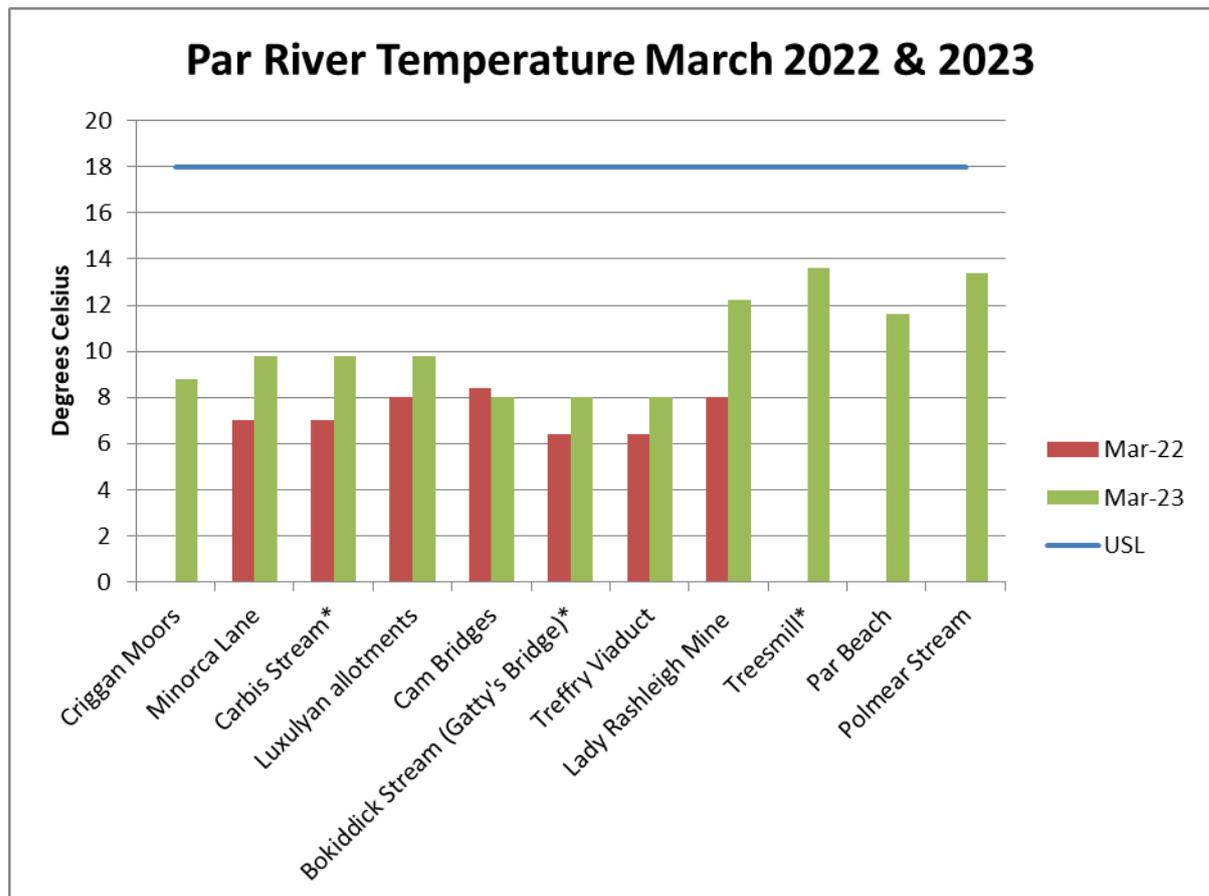
## 3. Results March 2023

PAR RIVER/TRIBUTARY	LOCATION	Temperature °Celsius
Par	Criggan Moors, SX 01882 61133	9
Par	South of Minorca Lane, Par River, SX 02657 59788	9.8
Tributary	Carbis Stream SX 02834 59401	9.8
Par	Luxulyan allotments, Par River, SX 04732 58045	9.8
Par	Cam Bridges, Par River, SX 05292 57454	8
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	8
Par	Treffry Viaduct, Par River, SX 05650 57179	8
Par	Lady Rashleigh Mine, Par River, SX 06451 56509	12.2
Tributary	Treesmill, Tywardreath Stream, SX 08873 55385	13.6
Par	Par Beach slipway, SX 0776 53261	11.6
Tributary	Polmear Stream, Ship Inn, SX 08749 53417	13.4

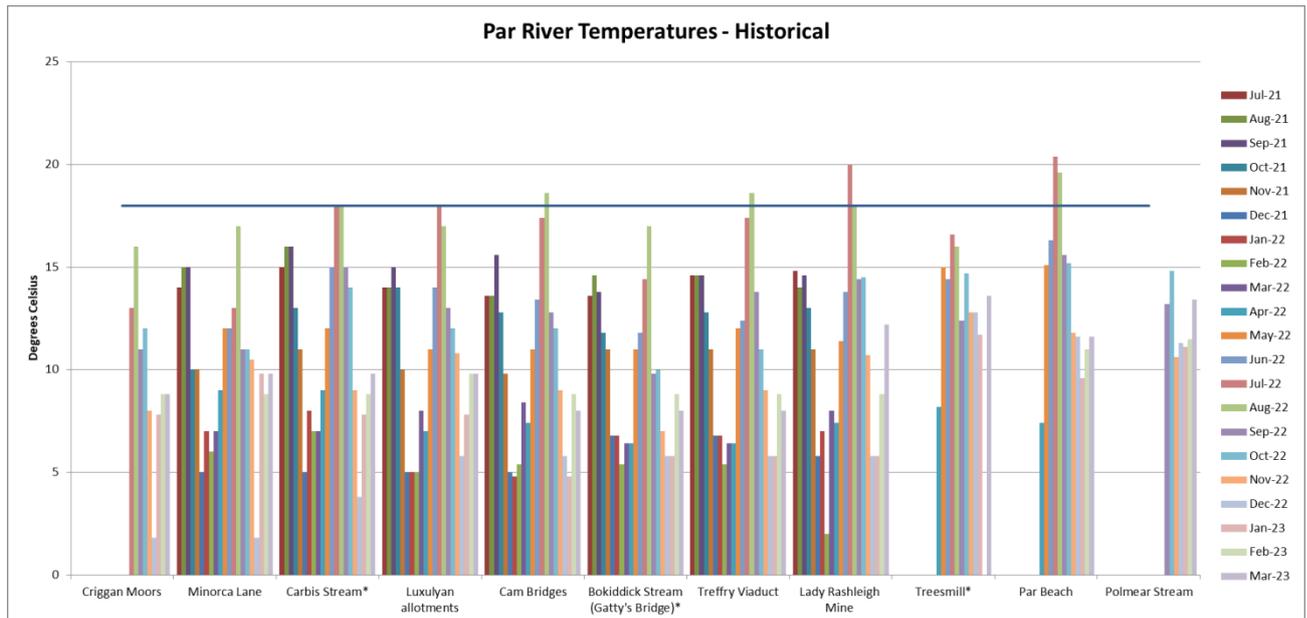
## 4. Graph March 2023 (and March 2022 for comparison)

\*indicates a tributary of the Par River.

**USL – Upper Safe Limit** Our assumption is that 18° Celsius is the upper safe limit for fish. This simplification is a useful rule of thumb.



## 5. Historical data on temperature:

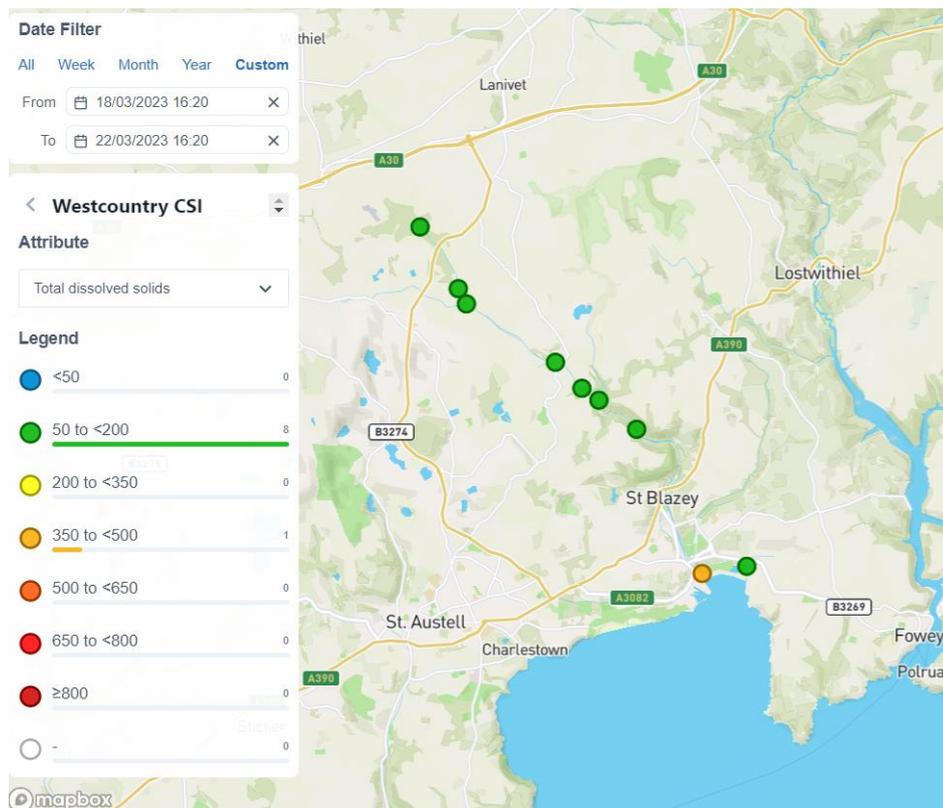
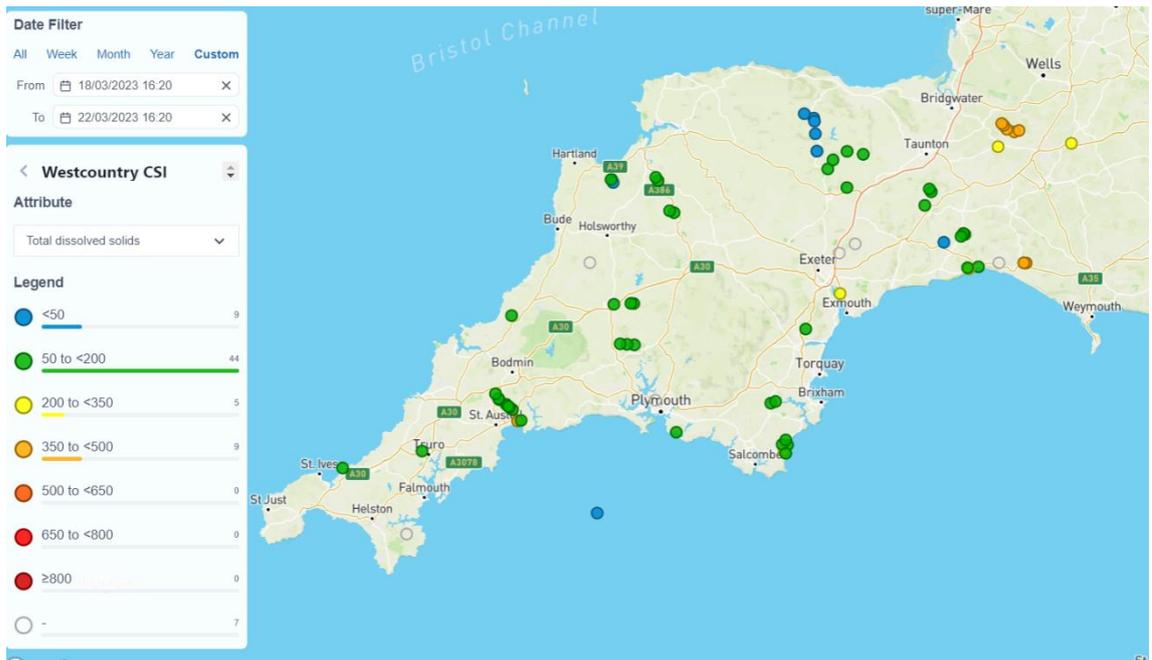


## E. TOTAL DISSOLVED SOLIDS

1. We measure these in ppm (parts per million). This is the WRT's explanation:

*Total Dissolved Solids (TDS) is directly related to the conductivity of the water. The more minerals, salts and metals that are dissolved in the water the more conductive it gets. Low levels of dissolved solids in waters such as those on Dartmoor near to the source of the river are a result of very low levels of input from the surrounding landscape. As the river runs down to the sea it collects material from many different inputs, some natural and some man-made such as farms, sewage plants, factories and residential areas. This typically increases the amount of solids dissolved in the water leading to a higher reading. Harmful pollution from things like sewage, slurry and factory discharge will usually elevate your TDS reading. However, some pollutants such as oil can lower conductivity; therefore it should be used as a general indicator of water quality not a specific measure of toxicity. Geology will influence the normal level of conductivity in a watercourse (e.g. Areas dominated by granite generally give a lower conductivity than those with limestone). Regular monitoring will allow the detection of changes in conductivity which can indicate pollution.*

2. Geographical **comparison**. Source: Cartographer.



3. Results March 2023

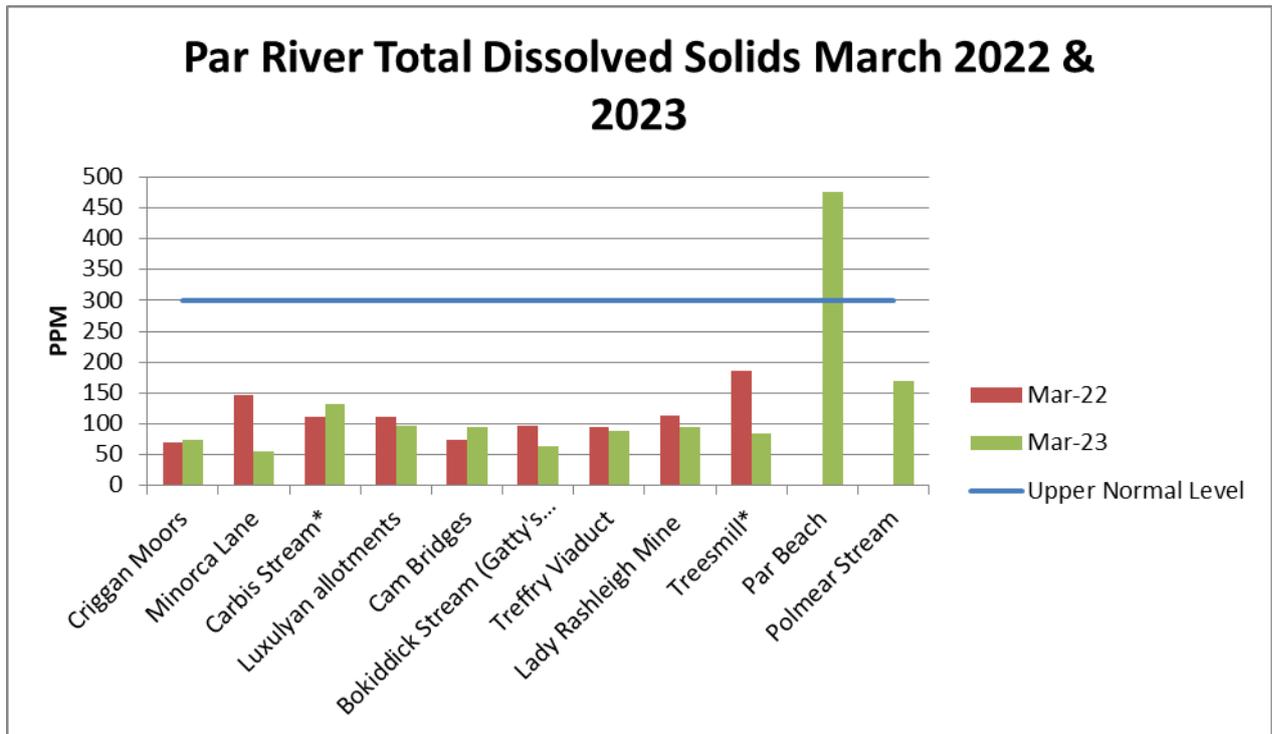
PAR RIVER/TRIBUTARY	LOCATION	Total Dissolved Solids PPM
Par	Criggan Moors, SX 01882 61133	74
Par	South of Minorca Lane, Par River, SX 02657 59788	56
Tributary	Carbis Stream SX 02834 59401	133
Par	Luxulyan allotments, Par River, SX 04732 58045	96
Par	Cam Bridges, Par River, SX 05292 57454	95
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	64
Par	Treffry Viaduct, Par River, SX 05650 57179	88
Par	Lady Rashleigh Mine, Par River, SX 06451 56509	95
Tributary	Treesmill, Tywardreath Stream, SX 08873 55385	85
Par	Par Beach slipway, SX 0776 53261	476
Tributary	Polmear Stream, Ship Inn, SX 08749 53417	169

\*indicates a tributary of the Par River.

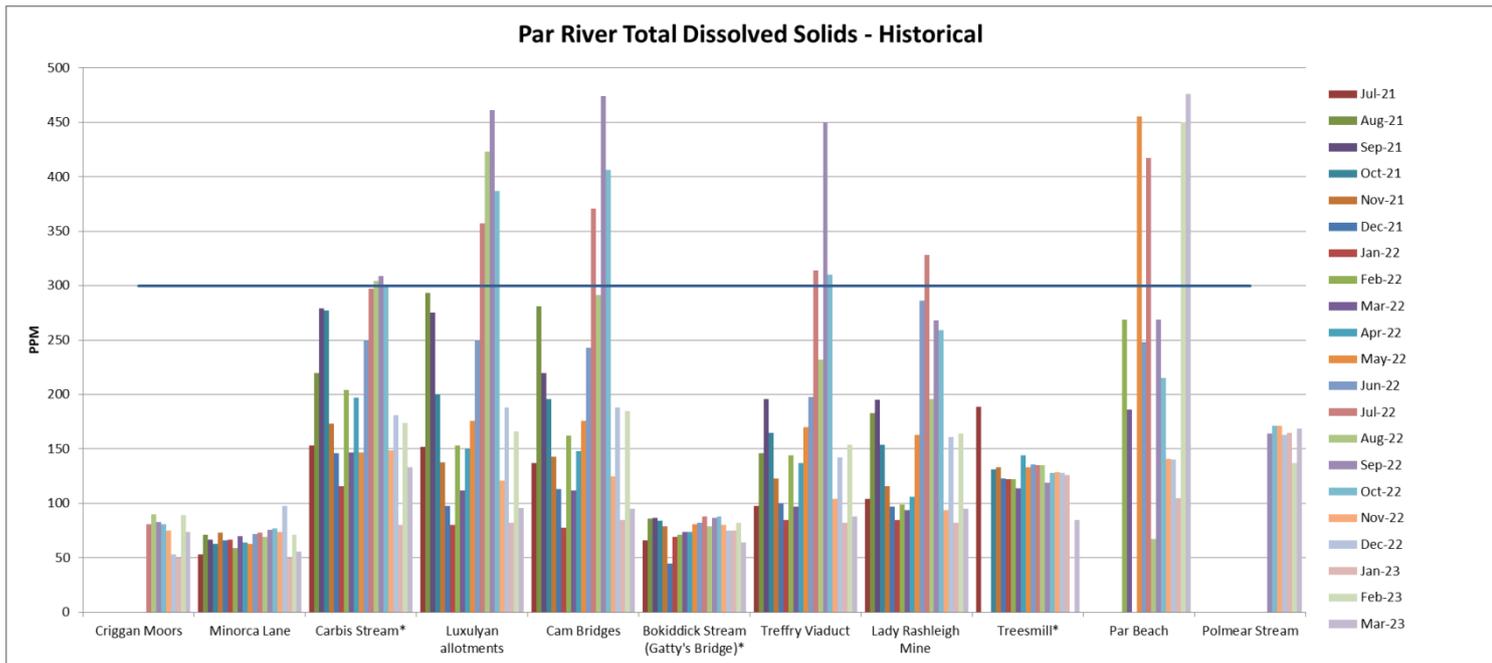
4. Graph March 2023 (and March 2022 for comparison)

Upper Normal Level

The WRT advice is: 'TDS levels vary between catchments due to natural geology etc. We generally say that after 6 months of sampling you should have an idea of what is 'normal' for your river. Looking at the scorecards for the Lower Par for 2020 and 2021 I would say that anything above 300 ppm is too high.'



## 2. Historical data on total dissolved solids:



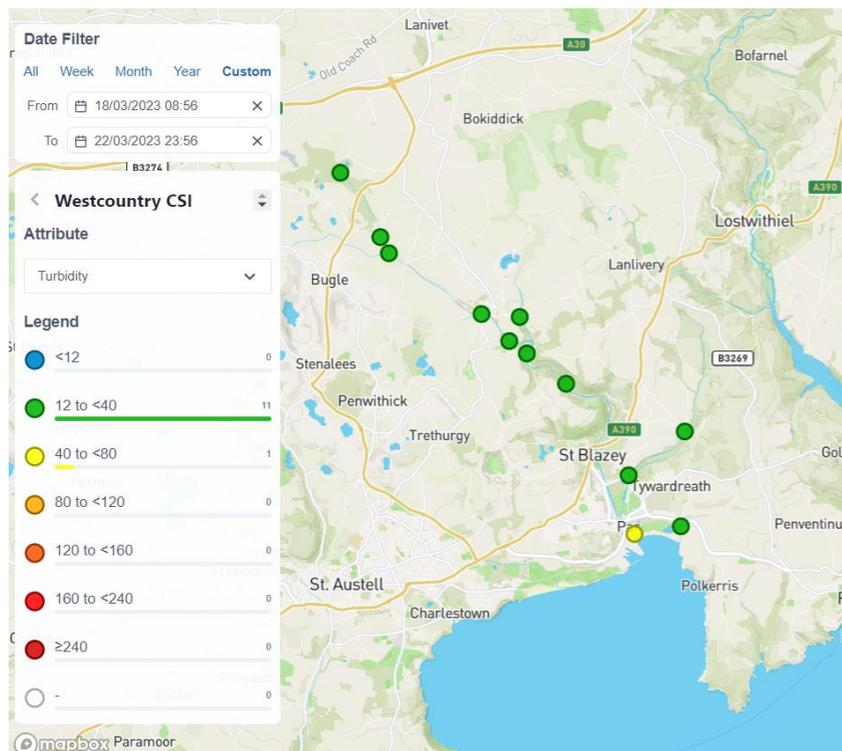
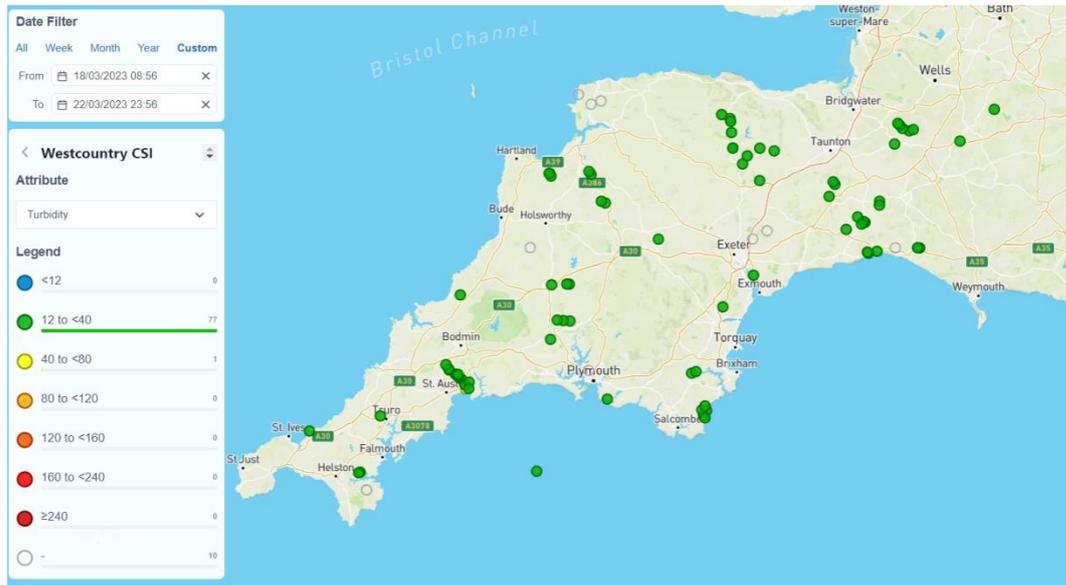
\*indicates a tributary of the Par River.

## F. TURBIDITY

1. This is the WRT explanation of this measure:

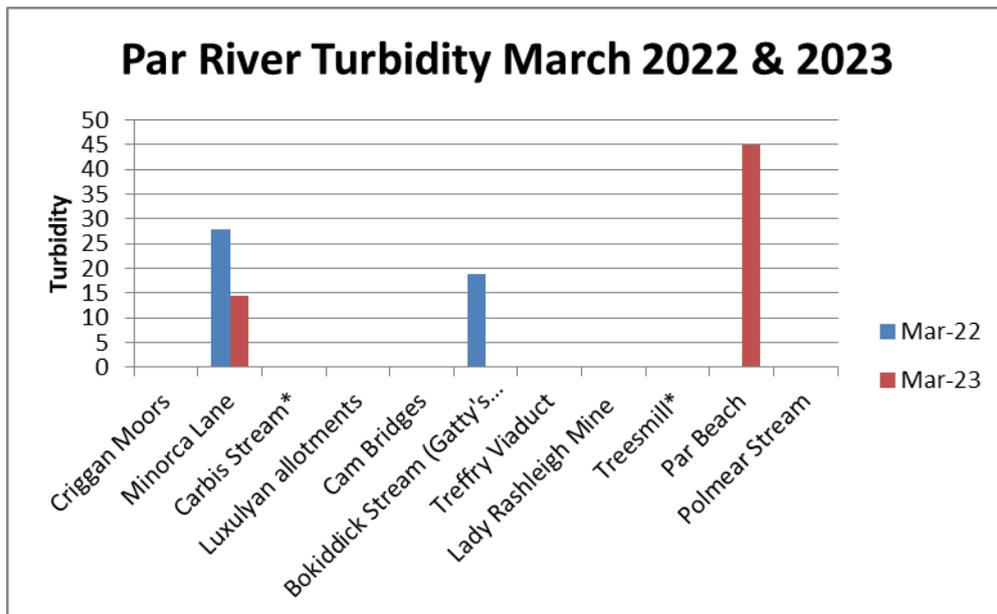
*Turbidity tube is a measure of the optical clarity of the water. The more suspended particles in the water the lower the clarity and the higher the turbidity. You will often find your waterbody gets more turbid after heavy rainfall due to soil running off the fields and sediment being mixed into the water column. This loss of topsoil is both a problem for farmer and river. It can often contain chemicals from the fertiliser and pesticides used on the land. An increase in sediment level on the substrate of the river can cause smothering of habitat by removing light and oxygen. Aquatic wildlife such as the less mobile invertebrates and fish eggs struggle to survive in low oxygen conditions and without light, plants are unable to grow. It is a good idea to sample your river after different weather conditions to understand how it responds to rainfall or drought.*

2. **Geographical comparison.** Where scores are shown as 0, it means that the reading using the Secchi tube was <12. Source: Cartographer.



PAR RIVER/TRIBUTARY	LOCATION	Turbidity
Par	Criggan Moors, SX 01882 61133	0
Par	South of Minorca Lane, Par River, SX 02657 59788	14.5
Tributary	Carbis Stream SX 02834 59401	0
Par	Luxulyan allotments, Par River, SX 04732 58045	0
Par	Cam Bridges, Par River, SX 05292 57454	0
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	0
Par	Treffry Viaduct, Par River, SX 05650 57179	0
Par	Lady Rashleigh Mine, Par River, SX 06451 56509	0
Tributary	Treesmill, Tywardreath Stream, SX 08873 55385	0
Par	Par Beach slipway, SX 0776 53261	45
Tributary	Polmear Stream, Ship Inn, SX 08749 53417	0

### 3. Results March 2023





## G. PHOSPHATES

1. This is the WRT's explanation of this measure.

*Phosphate occurs naturally within the river ecosystem, but in very low levels under 0.05 mg/l. Therefore, higher levels may indicate anthropogenic input. Phosphate is found in animal and human waste, cleaning chemicals, industrial runoff and fertiliser so this can be a good indicator of pollution. Having raised levels of phosphate can lead to increases in plant growth within the watercourse. This leads to a depletion of oxygen due to the plant's aerobic respiration during the night. Without oxygen aquatic species cannot survive and the river ecosystem collapses. (It is important to note that phosphate is taken up by plants. You may get a low reading but high plant growth, indicating eutrophication.)*

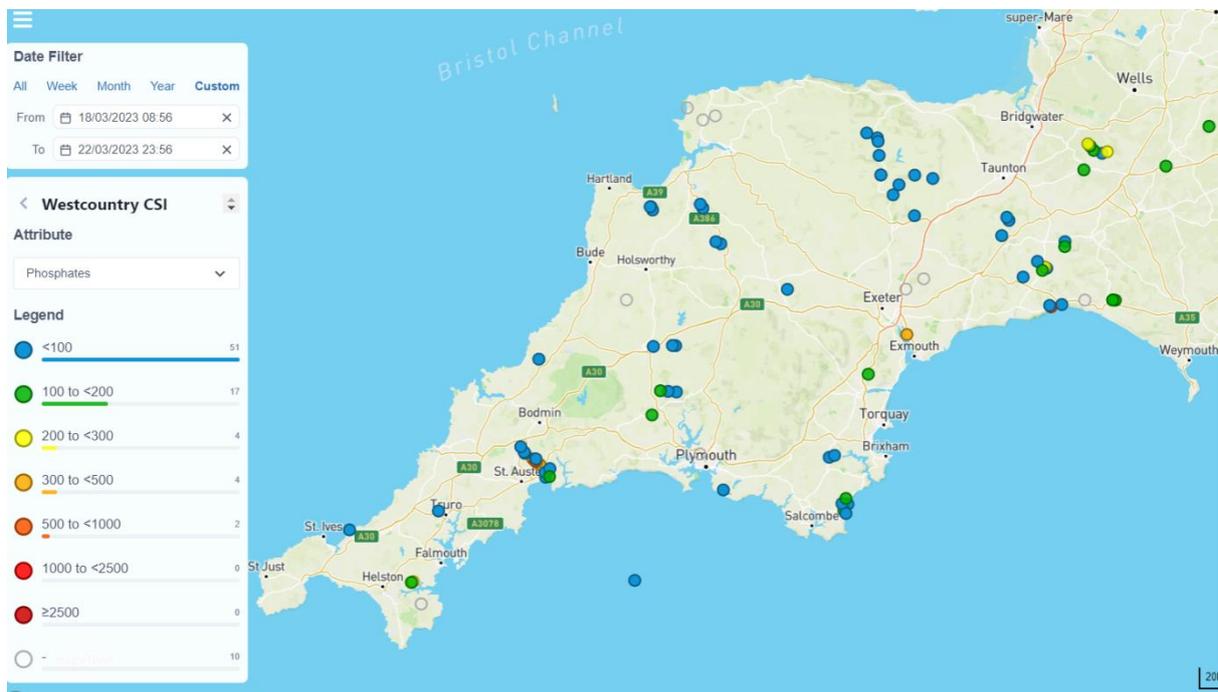
*Ranges on phosphate diagnostic colour chart:*

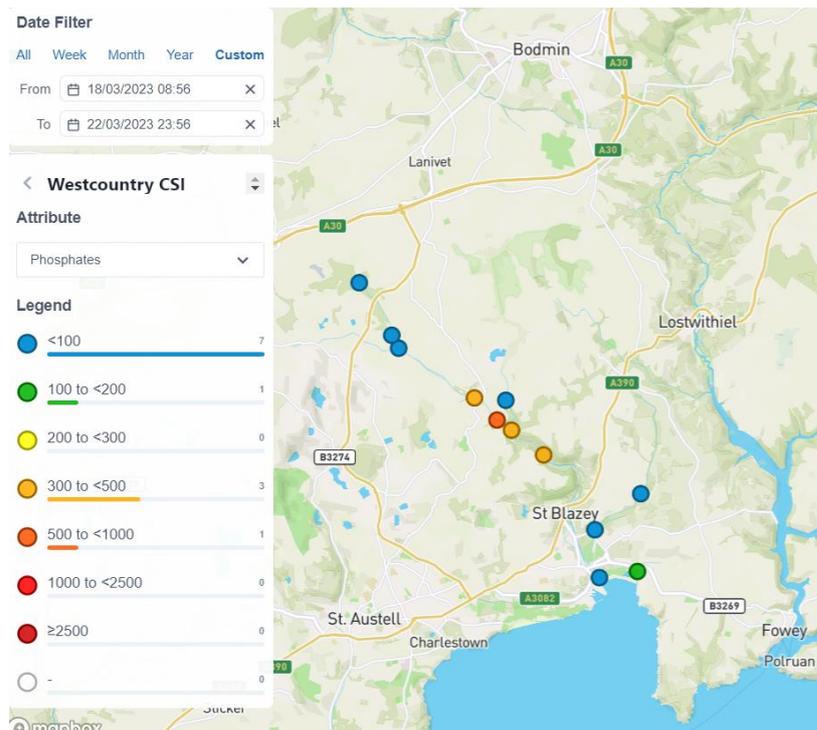
*0 – 100 OK*

*200 – 300 HIGH*

*500 – 2500 – TOO HIGH*

2. **Geographical comparison.** Source: Cartographer



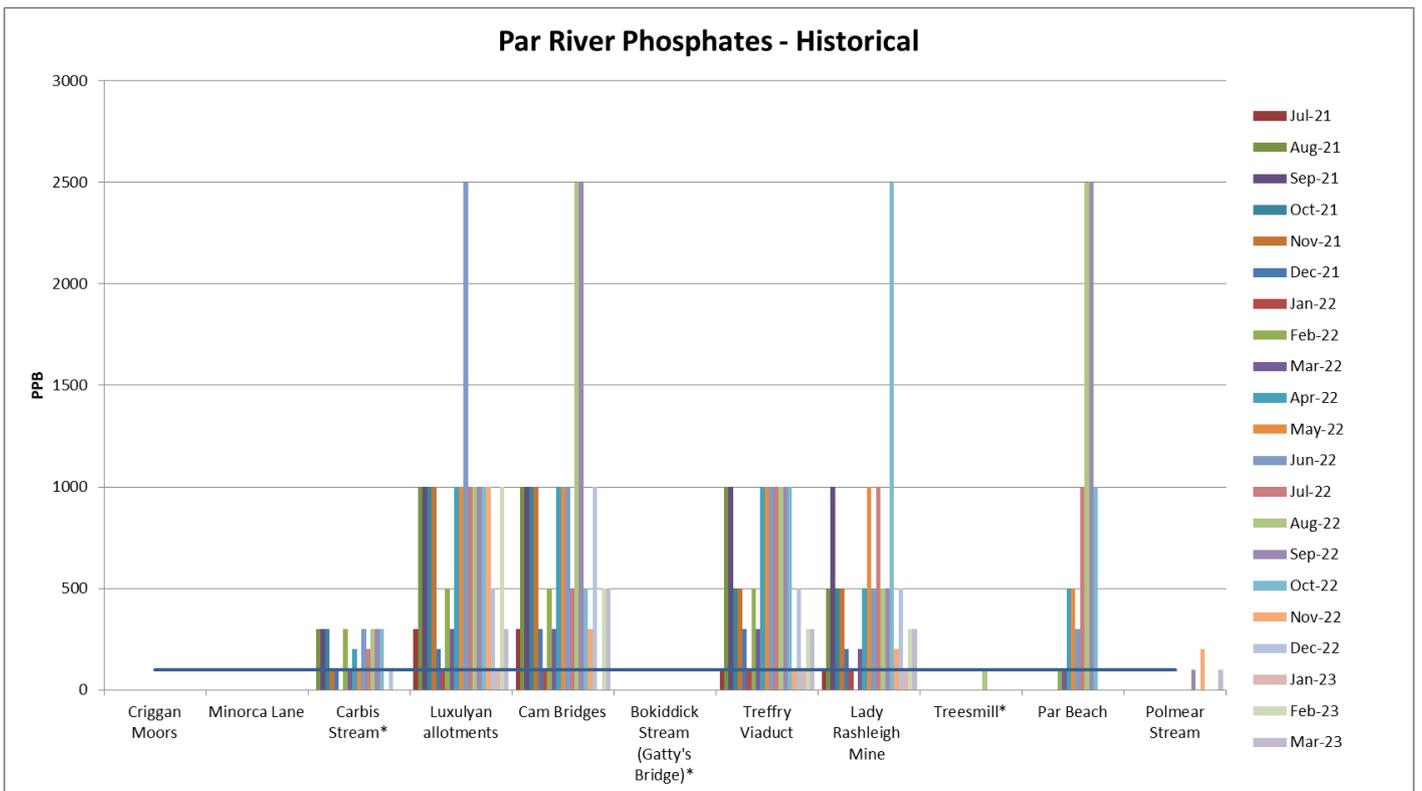
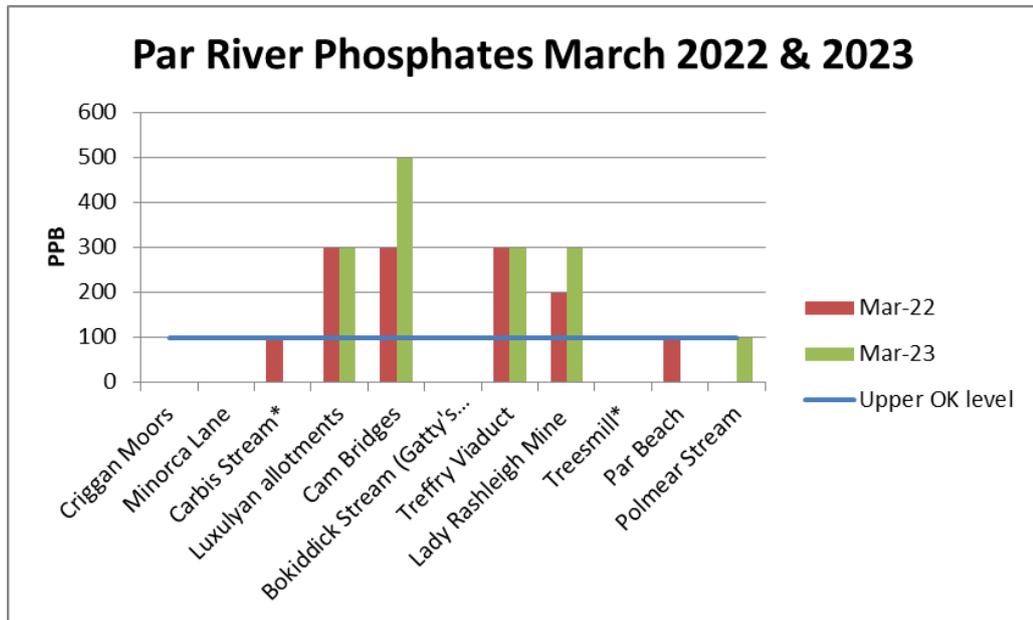


### 3. Results February 2023

PAR RIVER/TRIBUTARY	LOCATION	Phosphates PPB
Par	Criggan Moors, SX 01882 61133	0
Par	South of Minorca Lane, Par River, SX 02657 59788	0
Tributary	Carbis Stream SX 02834 59401	0
Par	Luxulyan allotments, Par River, SX 04732 58045	1000
Par	Cam Bridges, Par River, SX 05292 57454	500
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	0
Par	Treffry Viaduct, Par River, SX 05650 57179	300
Par	Lady Rashleigh Mine, Par River, SX 06451 56509	300
Tributary	Treesmill, Tywardreath Stream, SX 08873 55385	-
Par	Par Beach slipway, SX 0776 53261	0
Tributary	Polmear Stream, Ship Inn, SX 08749 53417	0

\*indicates a tributary of the Par River. USL is 100 Parts Per Billion which, according to WRT, is the Upper Safe Level.

5. Historical data on phosphates:



## H. BACTERIA (E.COLI (EC) & TOTAL COLIFORM (TC))

1. A sample was taken from the Par River at Lady Rashleigh Mine (SX 06451 56509). Joan Farmer incubated the samples.

### 2. Key information:

#### (a) What is the difference between total coliform and E. coli?

Total coliform is a large collection of different kinds of bacteria. Faecal coliform are types of total coliform that exist in faeces. E. coli is a subgroup of faecal coliform.

<https://doh.wa.gov/sites/default/files/legacy/Documents/Pubs//331-181.pdf>

#### (b) Why is E. coli in river water a concern?

The presence of E. coli **indicates faecal contamination of the drinking water** and as a result, there is an increased risk that enteric pathogens may be present. <https://www.canada.ca/en/health-canada/programs/consultation-e-coli-drinking-water/document.html>

Particular thanks are due to Joan Farmer for allowing the use of her home for the unpleasant process of incubating the samples and also for contacting the manufacturers of the kit in North Carolina, USA, for guidance on the results. Thanks too to Ross Tonkin for sharing his professional expertise.

#### (c) Interpreting the river group results:

Aquagenx CBT EC+TC MPN Kit gives a guide to help interpret the results of the incubated samples. This is an attempt at a simple guide linked to the **United States Environmental Protection Agency Recreational Water Health Risk Category Based on Most Probable Number (MPN) and Upper 95% Confidence Level**. However, this simplification should be used with caution until it has been checked by someone with relevant expertise.

MPN/100mL	Health Risk Category
0	Low Risk/Safe
10 - 40	Low Risk/Probably Safe
47 - 84	Low Risk/Possibly Safe
91 - 96	Intermediate Risk/Possibly Safe
136 - 171	High Risk/Probably Unsafe
326 - 483	Very High Risk/Unsafe
>1000	Very Unsafe

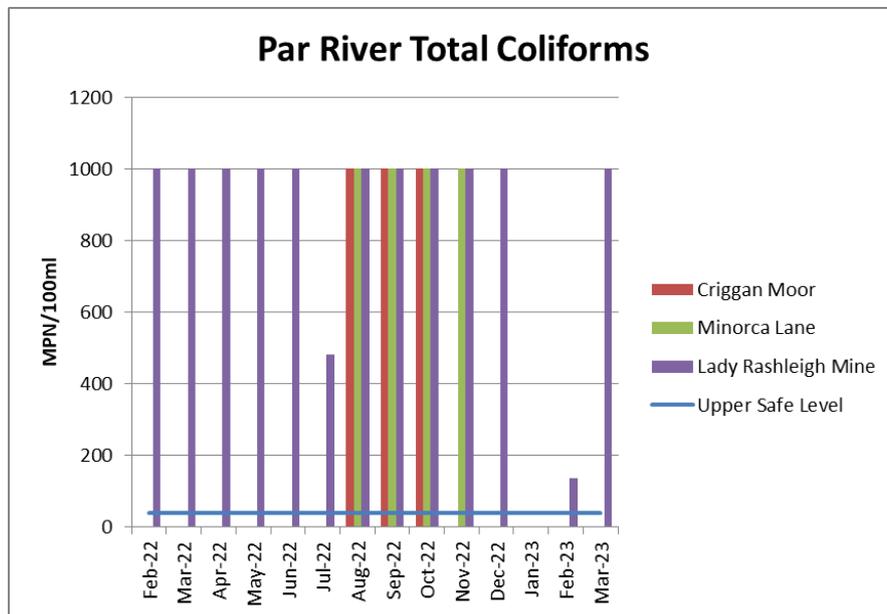
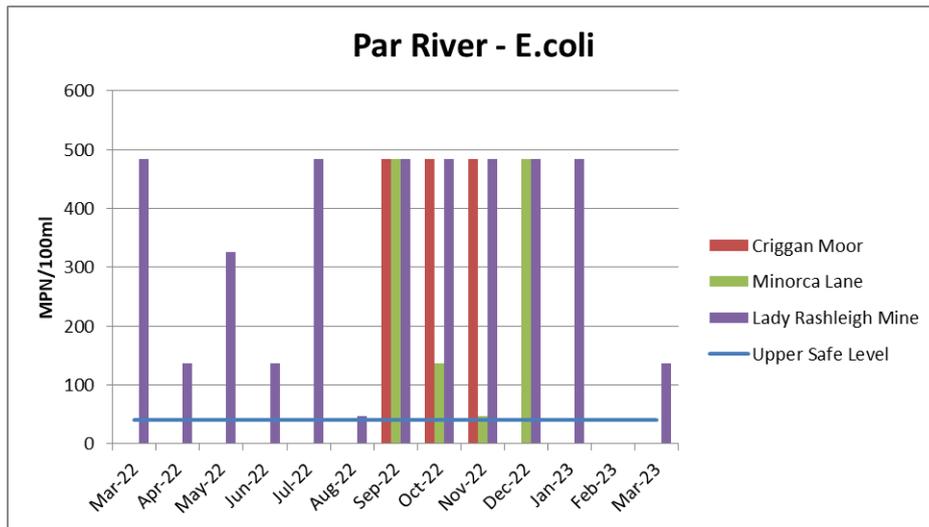
## 3. Monthly results including March 2023

<b>MONTH &amp; TEST</b>	<b>Criggan Moor (Upper Par) SX01882 61133 Sample &amp; Result Dates, Score &amp; Health Risk</b>	<b>Minorca Lane (Upper Par) SX02657 59788 Sample &amp; Result Dates, Score &amp; Health Risk</b>	<b>Lady Rashleigh Mine (Lower Par) SX06451 56509 Sample &amp; Result Dates, Score &amp; Health Risk</b>	<b>NOTES ON WEATHER, TEST ETC</b>
<b>FEBRUARY 2022</b>				
<b>E.coli</b>	n/a	n/a	21/02/2022 (23/02/2022; 24/02/2022)  483 <sup>1</sup> <b>Very High/ Unsafe</b>  483 <sup>2</sup> <b>Very High Risk /Unsafe</b>	Rain prev. 24 hrs
<b>Total Coliform</b>	n/a	n/a	21/02/2022 (23/02/2022; 24/02/2022)  >1000 <b>Very Unsafe</b>  >1000 <b>Very Unsafe</b>	Rain prev. 24 hrs
<b>MARCH 2022</b>				
<b>E.coli</b>	n/a	n/a	21/03/2022; 24/02/2022 <b>136</b> <b>High Risk.</b> <b>Probably unsafe.</b>	Dry
<b>Total Coliform</b>	n/a	n/a	21/03/2022; 24/02/2022  >1000 <sup>3</sup> <b>Very Unsafe</b>	Dry
<b>APRIL 2022</b>				
<b>E.coli</b>	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	n/a	n/a	16/04/2022; 18/04/2022 <b>326</b> <b>Very High Risk /Unsafe</b>	Dry and sunny following rain. Temp over 30° C.
<b>Total Coliform</b>	n/a	n/a	16/04/2022; 18/04/2022 >1000 <b>Very Unsafe</b>	Dry and sunny following rain. Temp over 30° C. Definitely blue in

				compartments 4 & 5.
<b>MAY 2022</b>				
<b>E.coli</b>	n/a	n/a	9/05/2022; 11/05/2022 <b>136</b> <b>High Risk. Prob.</b> <b>Unsafe</b>	Dry
<b>Total Coliform</b>	n/a	n/a	9/05/2022; 11/05/2022 <b>&gt;1000</b> <b>Very Unsafe</b>	Dry Def. blue
<b>JUNE 2022</b>				
<b>E.coli</b>	n/a	n/a	27/06/2022; 29/06/2022 <b>483</b> <b>Very High Risk/</b> <b>Unsafe</b>	Rain in prev. 24 hours
<b>Total Coliform</b>	n/a	n/a	27/06/2022; 29/06/2022 <b>&gt;1000</b> <b>Very Unsafe</b>	Rain in prev. 24 hours Def. blue
<b>JULY 2022</b>				
<b>E.coli</b>	n/a	n/a	18/07/2022; 20/07/2022 <b>47</b> <b>Low Risk/Possibly</b> <b>Safe<sup>4</sup></b>	Dry
<b>Total Coliform</b> 18/07/2022; 20/07/2022	n/a	n/a	18/07/2022; 20/07/2022 <b>483</b> <b>Very High Risk/</b> <b>Unsafe</b>	Dry
<b>AUGUST 2022</b>				
	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	19/08/2022 <b>483</b> <b>Very High Risk/</b> <b>Unsafe</b>	19/08/2022 <b>483</b> <b>Very High Risk/</b> <b>Unsafe</b>	21/08/2022; 23/08/2022 <b>483</b> <b>Very High Risk/</b> <b>Unsafe</b>	
<b>Total Coliform</b>	19/08/2022 <b>&gt;1000</b> <b>Very Unsafe</b>	19/08/2022 <b>&gt;1000</b> <b>Very Unsafe</b>	21/08/2022; 23/08/2022 <b>&gt;1000</b> <b>Very Unsafe</b>	Light rain
<b>SEPTEMBER 2022</b>				
	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	16/09/2022 <b>483</b> <b>Very High Risk/</b> <b>Unsafe</b>	16/09/2022 <b>136</b> <b>High Risk/Probably</b> <b>Unsafe</b>	17/09/2022; 19/09/2022 <b>483</b> <b>Very High Risk/</b> <b>Unsafe</b>	No rain
<b>Total Coliform</b>	16/09/2022 <b>&gt;1000</b> <b>Very Unsafe</b>	16/09/2022 <b>&gt;1000</b> Very Unsafe	17/09/2022; 19/09/2022 <b>&gt;1000</b> <b>Very Unsafe</b>	No rain
<b>OCTOBER 2022</b>				
	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	17/10/2022 <b>483</b>	17/10/2022 <b>47</b>	15/10/2022 <b>483</b>	Dry. Light rain in previous 24

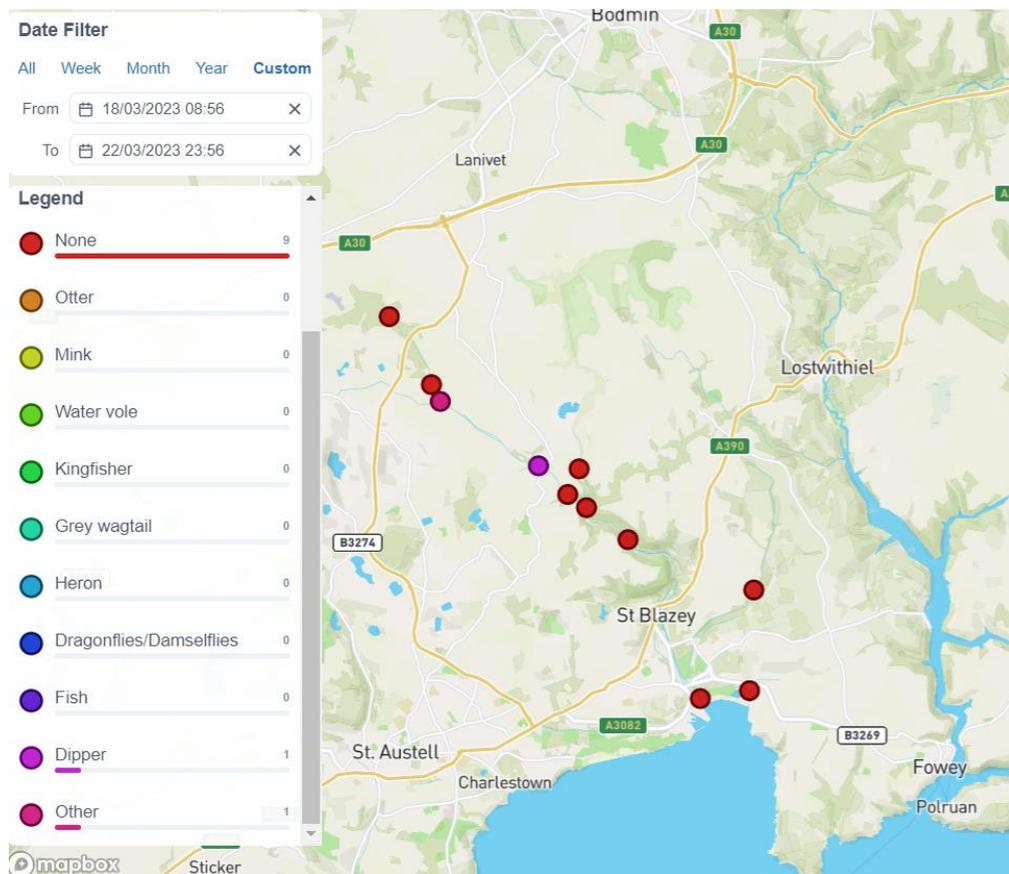
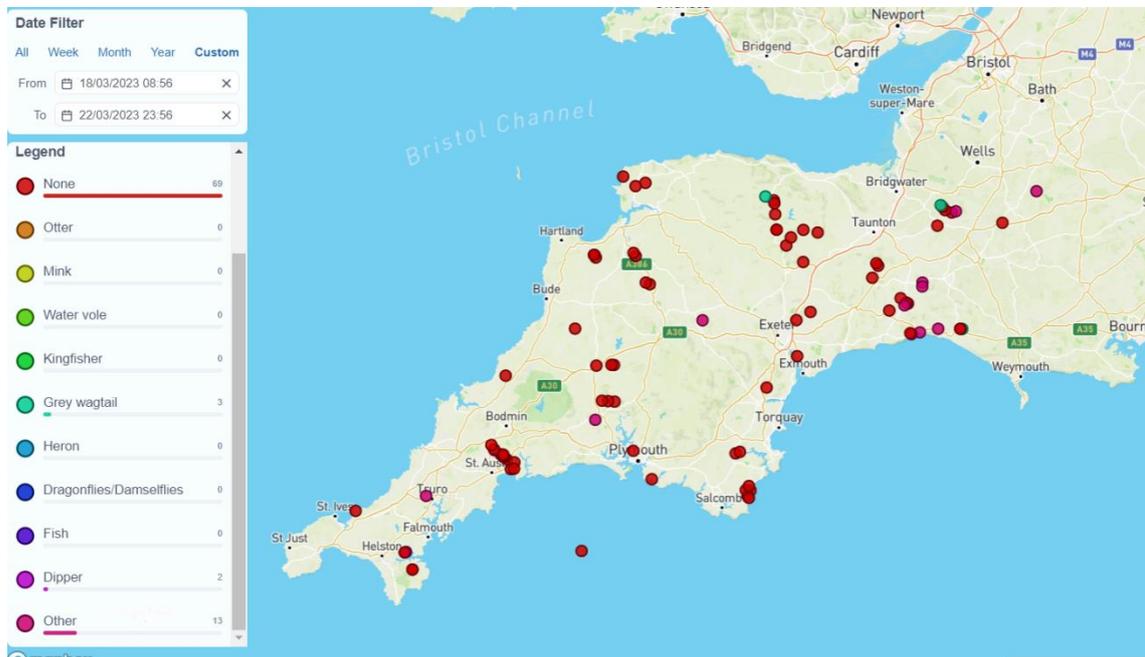
	<b>Very High Risk/ Unsafe</b>	<b>Low Risk/Possibly Safe</b>	<b>Very High Risk/ Unsafe</b>	hours. River low.
<b>Total Coliform</b>	17/10/2022 >1000 <b>Very Unsafe</b>	17/10/2022 >1000 <b>Very Unsafe</b>	15/10/2022 >1000 <b>Very Unsafe</b>	Dry. Light rain in previous 24 hours. River low.
<b>NOVEMBER 2022</b>	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	No sample	16/11/2022 <b>483</b> <b>Very High Risk/ Unsafe</b>	16/11/2022 <b>483</b> <b>Very High Risk/ Unsafe</b>	Heavy rain
<b>Total Coliform</b>	No sample	16/11/2022 >1000 <b>Very Unsafe</b>	16/11/2022 >1000 <b>Very Unsafe</b>	Heavy rain
<b>DECEMBER 2022</b>	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	No sample	No sample	18/11/2022 <b>483</b> <b>Very High Risk/ Unsafe</b>	Heavy rain
<b>Total Coliform</b>	No sample	No sample	18/11/2022 >1000 <b>Very Unsafe</b>	Heavy rain
<b>JANUARY 2023</b>	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	No sample	No sample	No sample	
<b>Total Coliform</b>	No sample	No sample	No sample	
<b>FEBRUARY 2023</b>	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	No sample	No sample	<b>136</b> <b>High Risk. Prob. Unsafe</b>	Light rain in previous 24 hours. River level average or slightly lower.
<b>Total Coliform</b>	No sample	No sample	<b>136</b> <b>High Risk. Prob. Unsafe</b>	Light rain in previous 24 hours. River level average or slightly lower.
<b>MARCH 2023</b>	<b>Criggan</b>	<b>Minorca Lane</b>	<b>Lady Rashleigh</b>	
<b>E.coli</b>	No sample	No sample	22/3/2022 >1000 <b>Very Unsafe</b>	Light rain in previous 24 hours.
<b>Total Coliform</b>	No sample	No sample	22/3/2022 >1000 <b>Very Unsafe</b>	Light rain in previous 24 hours.

1. Readings taken twice on the 1<sup>st</sup> sample as it took 12 hours to reach the minimum temperature of 25 degrees.
2. Originally >1000 but I now believe this reading should be 483 and the traces of blue in compartment 5 had leaked out of one of the other compartments as the clip was not positioned exactly along the maximum fill line.
3. Compartments 4 and 5 had only very pale blue fluorescence in UV light, but definitely glowed with no trace of yellow. Aquagenx company confirmed that fluorescence under UV light indicates positive for total coliforms.
4. Due to hot weather, limited additional heat was added. The temperature for most of the time was between 25 and 30 so should have been left for 40-48 hours. Insufficient time given (36 hrs) so results may be wrong.



I. WILDLIFE (FOR OTTER REPORT SEE SECTION J)

(a) Maps



Source: Cartographer.

Otter spraint is included, as usual, under 'Other'.

**(b) Wildlife sightings at the monitoring points included:**

<b>PAR RIVER/TRIBUTARY</b>	<b>LOCATION</b>	<b>WILDLIFE NOTED</b>
Par	Criggan Moors, SX 01882 61133	None.
Par	South of Minorca Lane, Par River, SX 02657 59788	None
Tributary	Carbis Stream SX 02834 59401	Pond skater
Par	Luxulyan allotments, Par River, SX 04732 58045	Dipper
Par	Cam Bridges, Par River, SX 05292 57454	None
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	None
Par	Treffry Viaduct, Par River, SX 05650 57179	None
Par	Lady Rashleigh Mine, Par River, SX 06451 56509	None
Tributary	Treesmill, Tywardreath Stream, SX 08873 55385	None
Par	Par Beach slipway, SX 0776 53261	None
Tributary	Polmear Stream, Ship Inn, SX 08749 53417	None

**J. OTTER SURVEY****1. SURVEY CONDITIONS**

<b>Date &amp; time</b>	22/3/2023, 25/3/2023
<b>Surveyors</b>	Roger Smith, Dave Burrell, Joan Farmer, Veronica Jones, Linda Smith
<b>Areas surveyed</b>	Upper Par (Criggan Moors and Minorca Lane); Par River from STW to Cam Bridges; Par River from Treffry Viaduct to Lady Rashleigh Mine; Lady Rashleigh Mine to river path downstream from former Prideaux Woods china clay works, Bokiddick Stream at Gatty's Bridge.
<b>Weather</b>	Rain
<b>River level</b>	High
<b>River flow</b>	Steady to Surging
<b>Water quality</b>	Phosphate readings 1000 PPB at the highest (Luxulyan allotments), 500 at Cam Bridges, 300 at Treffry Viaduct and Lady Rashleigh Mine. All readings zero upstream from the allotments.
<b>Other wildlife</b>	Dipper at Luxulyan allotments. Pond skater in Carbis stream near Higher Menadue.

## 2. EVIDENCE FOR OTTERS ✓

EVIDENCE	SEEN/ ORKS*	LOCATION	NOTES
Spraint - fresh			
Spraint – recent			
Spraint - old			
Anal jelly	✓*	Lady Rashleigh Mine, Par River, SX 06451 56509	
Sign heap			
Staining			
Tracks			
Path			
Slide			
Holt			
Hover			
Couch			
Live sighting			
Corpse			

\*Report sent to ORKS: <https://ercis.org.uk/>

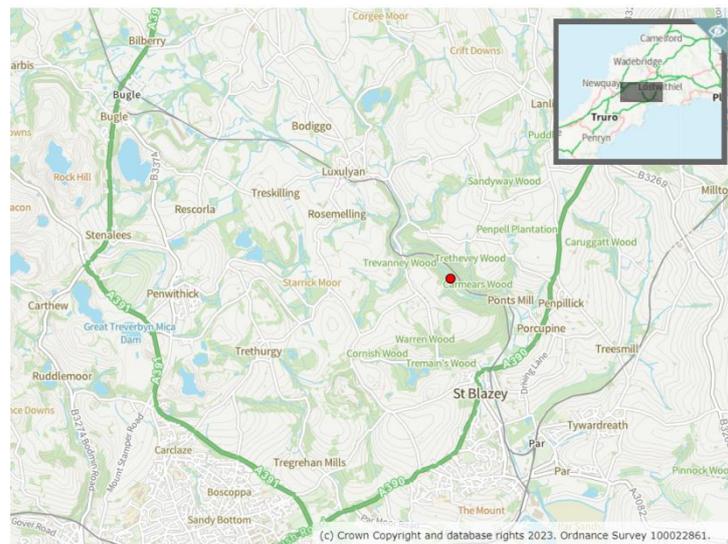
## 3. MAP

Source: <https://magic.defra.gov.uk/MagicMap.aspx>

Red dots – definite evidence. Recorded on ORKS.

Black dots – possible evidence. Not recorded on ORKS.

Green dots – definite evidence but may have been recorded in the previous month, e.g. old spraint.



#### 4. PHOTOGRAPHS



Looking downstream from boulder at Lady Rashleigh Mine

#### 5. COMMENTS

Given how high river levels were, the lack of spraint was not a surprise. It was surprising that no evidence was found under the canal bridge at Pontois Mill but boot prints and other marks on the gravel suggests there has been disturbance.

#### K. ARMI RIVERFLY SURVEY

No survey was carried out this month.

## L. DISCUSSION

### 1. Positive observations

(a) There was evidence for otters which, given the very high water levels, was a pleasant surprise. A dipper was seen near Luxulyan allotments, which is the first time we have seen this bird so far upstream.



High river level at Cam Bridges (SX 05292 57454) Photo: Joan Farmer

(b) The Carbis Stream did not look white as it often does, suggesting that any china clay was diluted.



The bed of the Carbis Stream is paler than the main river at the confluence (SX 02834 59401) but the water was relatively clear.

## 2. Points of concern

(a) Despite the diluting effect of higher river levels, phosphates were Too High (WRT standards) on the main river from Luxulyan allotments downstream to Lady Rashleigh Mine (1000, 500, 300 and 300 PPB from upstream to downstream). For the avoidance of doubt, it should be said that the source of high phosphates is thought to be St Austell North STW and not the allotments, which happen to be a convenient testing spot downstream from the works.

(b) The significance of bacteria results is open to question (see Areas of Doubt). That said, levels of 1000 MPN/100 ml for E.coli and Total Coliforms at Lady Rashleigh Mine in Luxulyan Valley raises some concern in the minds of lay people.

## 3. Areas of doubt

(a) We cannot state with certainty but make the working assumption that the high phosphate levels are linked to the St Austell North STW at Luxulyan.

(b) We do not know if the bacteria levels are genuinely high risk and unsafe because the Aquagenx testing is for recreational waters in the USA. The Environment Agency bacteria testing, which also includes Intestinal Enterococci, is far more sophisticated and uses different measures. Our testing may show trends and might trigger special attention from the EA.

(c) Very high levels of Total Dissolved Solids at Par Beach slipway have been recorded before but are unusual. Over time, recording has taken place at all states of the tide. There seems no obvious explanation.



Par River near slipway SX 0776 53261

Photo: Brian Harrison

**Report compiled by Dave Burrell, Joan Farmer & Roger Smith for the Par River Monitoring Group, 6<sup>th</sup> April 2023.**