

Water Quality in the Culm

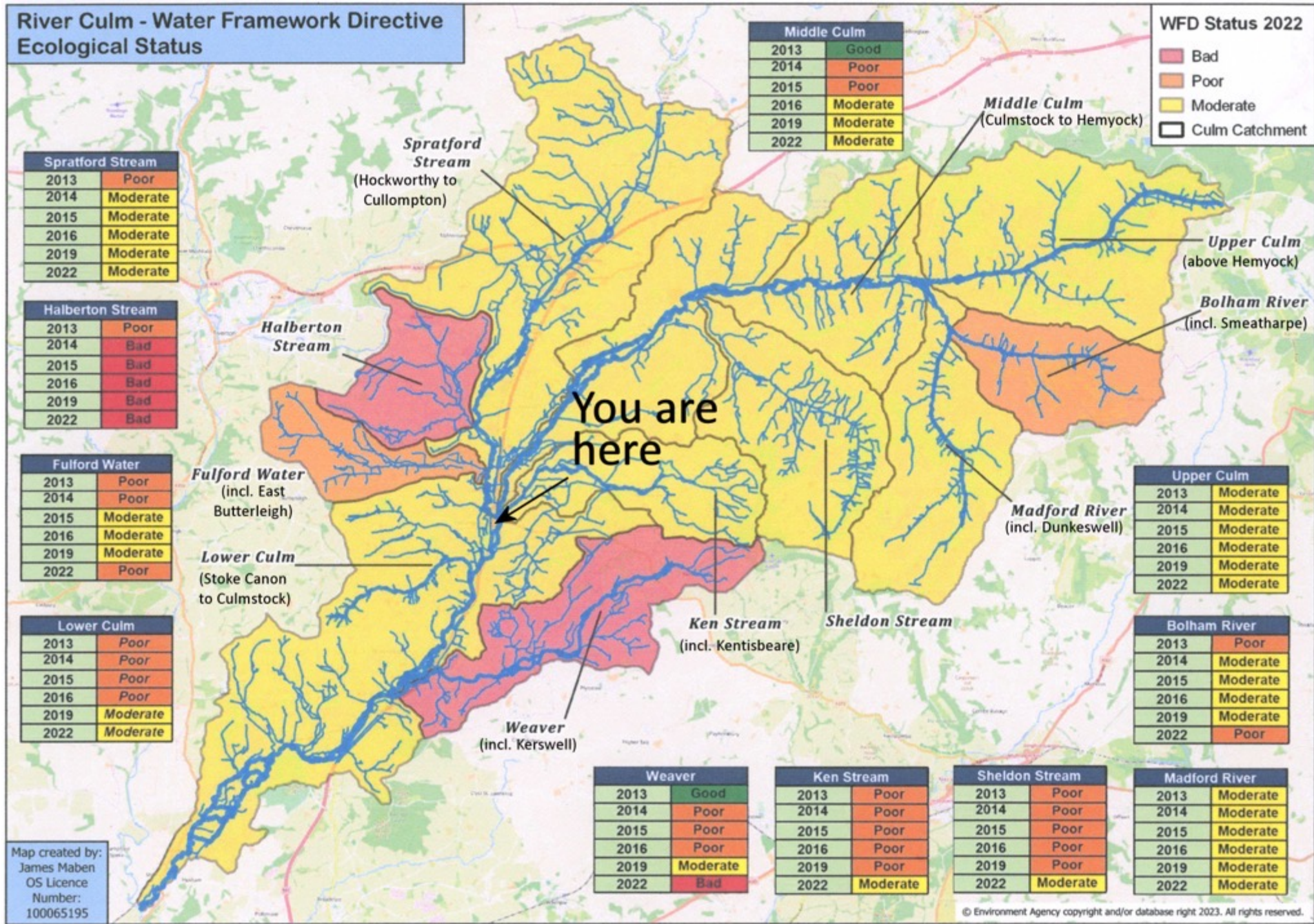
Citizen Science Driving Change

Richard Horrocks and Tim Burt



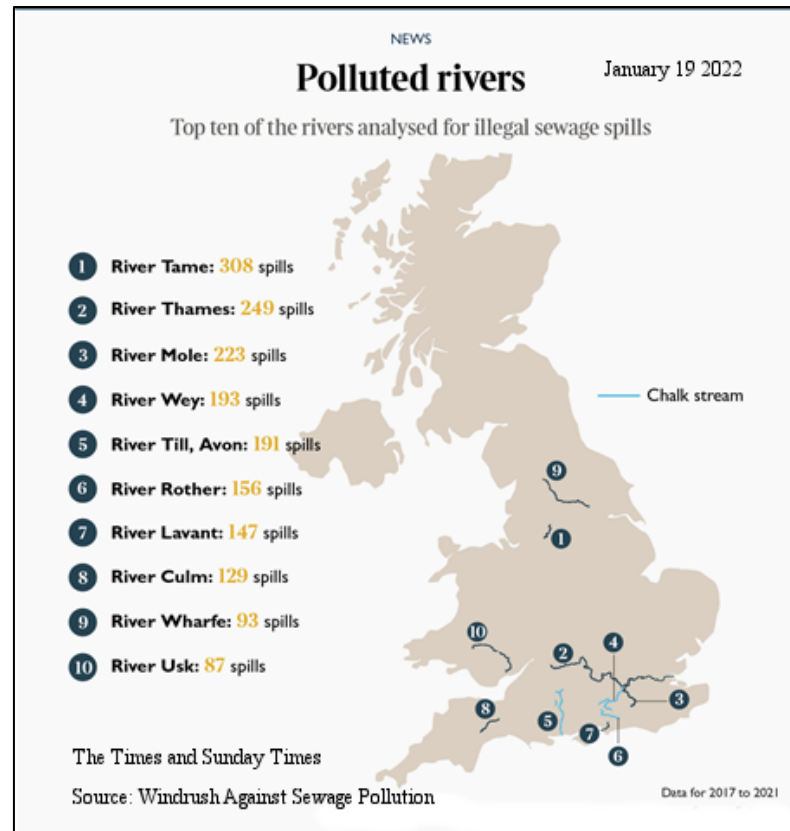
Connecting the Culm
Forum #6 - 14 March 2024

River Culm - Water Framework Directive Ecological Status



What affects Water Quality?

- Agriculture
 - Livestock waste
 - Fertilizer run-off
 - Soil management
- Sewage Treatment
 - Sewage 'Spills'
 - Private sewage discharges
 - Increased development
- Road Runoff
 - 10 km of the M5 drain into the Culm



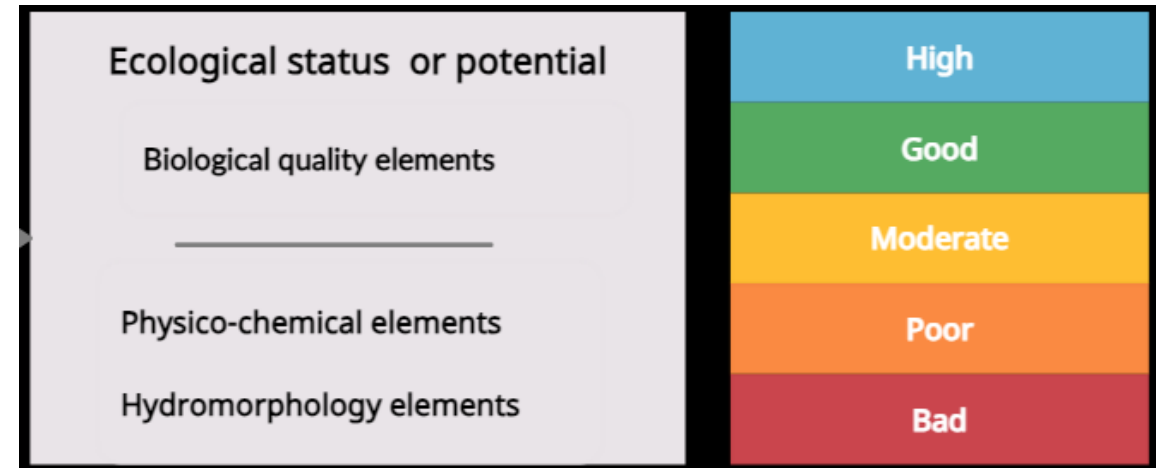
Devon farm fined over £4k for polluting watercourse with slurry

The Guardian Thu 5 Oct 2023
Rachel Salvidge and Leana Hosea

“Hundreds of potentially toxic road runoff outfalls polluting England’s rivers. No regulator is monitoring scale of impact of dangerous chemicals on wildlife or public health”

Why we need more data

- WFD Ecological Status is a combination of many factors
 - Difficult to spot nuance
- The Environment Agency is undertaking fewer surveys
- The WFD is unlikely to continue (post Brexit)
 - Its replacement 'River Surveillance Network' (RSN) is likely to be less detailed
- We don't choose when and where to survey
- The information is always historic – the last assessment was in 2022



'Citizen Science'

- “The collection and analysis of data relating to the natural world by members of the general public, typically as part of a collaborative project with professional scientists.”
 - Methods that are quality assured and standard
 - A co-ordinated network of volunteers
 - A means to record and analyse the results
 - Data that is complementary to ‘government’ collection and analysis – it is valued by both official and public environmental interest groups

Citizen Science Projects on the River Culm

- Riverfly



- Citizen Science Investigations (CSI)





- Launched nationally in 2007, 50+ sites in the Exe catchment
- Currently 12 sites on the Culm, from Rewe to above Hemyock

Target Groups



- Results are scored and recorded

Angler's Monitoring Initiative (AMI)

Armi Hub Armi Group Catchment

River Site NGR

Site Record

Year

Predicted level

EA Trigger level

Date

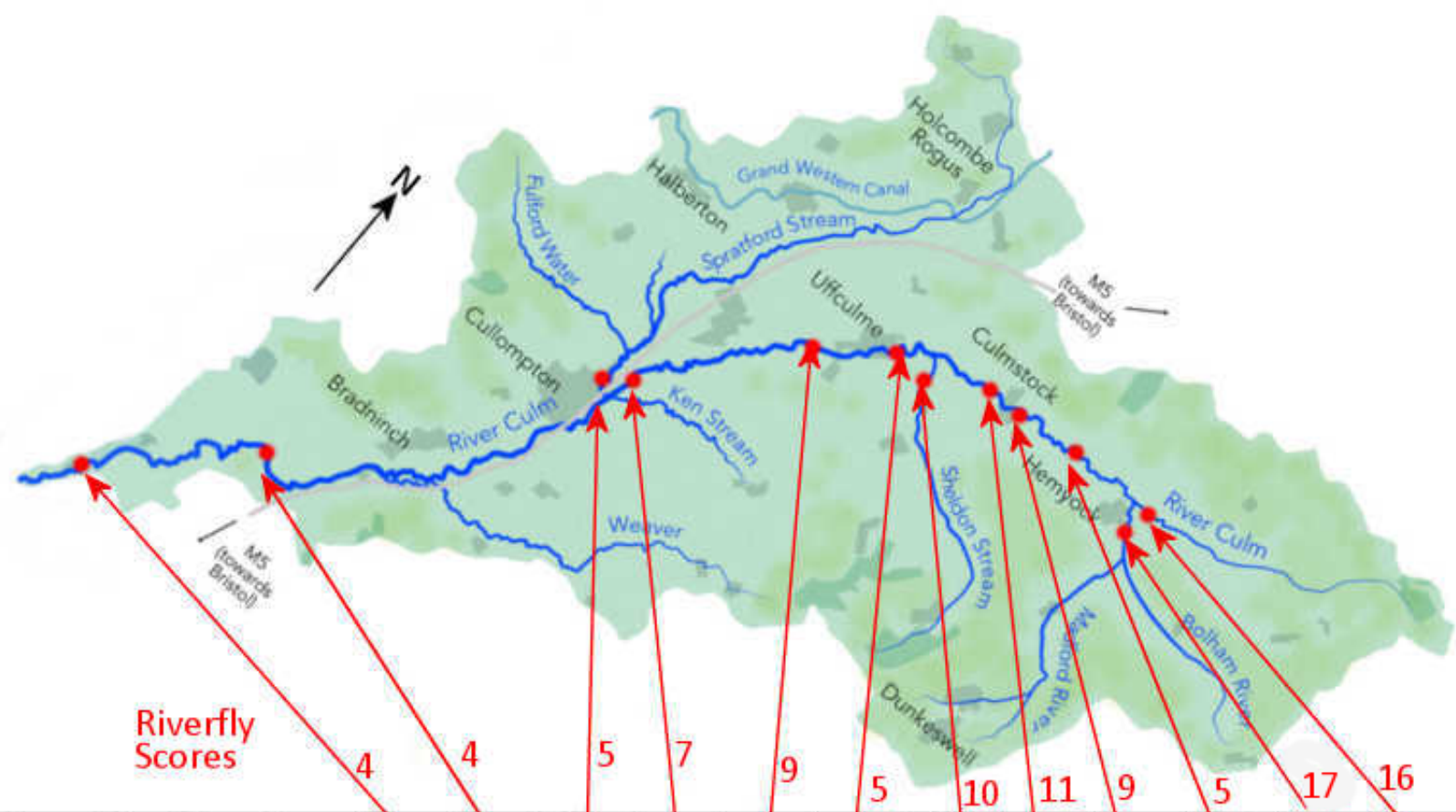
Time

Undertaken by

Target Groups:

- Cased caddis (Trichoptera)
- Caseless caddis (Trichoptera)
- Mayfly (Ephemeroidea)
- BWO (Ephemeroidea)
- Flat bodied (Heptageniidae)
- Olives (Baetidae)
- Stoneflies (Plecoptera)
- Freshwater shrimp (Gammarus)

Spring		Summer		Autumn					
19-May-23		21-Jul-23		13-Sep-23					
16:00		14:00		16:00					
RH		RH		RH					
Count	Score	Count	Score	Count	Score	Count	Score	Count	Score
0		1	1	0					
4	1	1	1	0					
0		2	1	0					
2	1	0		0					
12	2	2	1	8	1				
50	2	0		50	2				
20	2	2	1	5	1				
2	1	0		2	1				
Total Score		9		5		5		0	



River Culm Riverfly Count Summer 2023	Culm at Rewe	Culm near Killerton	Spratford Stream Cullompton	Culm above Cullompton	Culm below Uffculme	Culm above Uffculme	Sheldon Stream at Craddock	Culm below Culmstock	Culm above Culmstock	Culm at Whitehall	Madford River above Hemyock	Culm above Hemyock
Cased caddis (Trichoptera)				3	4		3	10		1	140	30
Caseless caddis (Trichoptera)				10	12	6	1	14	10	1	27	22
Mayfly (Ephemeroidea)							7	1		2	7	12
BWO (Ephemeroidea)											8	
Flat bodied (Heptageniidae)			2	4	5	2	50	8	10	2	60	110
Olives (Baetidae)				5	10	3	1	10	50		20	30
Stoneflies (Plecoptera)			2	2	4	1	100	10		2	120	120
Freshwater shrimp (Gammarus)	2000	1500	500	16	14	6	5	200	200		160	80

Westcountry CSI

- Temperature
- Turbidity (the concentration of particles – ‘cloudiness’)
- Total Dissolved Solids – TDS (the concentration of dissolved substances)
- Phosphate



Westcountry C.S.I.
Citizen Science Investigations

Survey Details

Site Name - River/Stream: _____ at Location: _____

Grid Reference: _____

Date: _____ Time: _____ Observer Name: _____

Type of waterbody (tick one)

River Stream Lake Pond Estuary/tidal

Other: _____

Rain in previous 24 hours (tick one)

None Light rain/showers Heavy or prolonged rain

Please take up to four photos to go with your survey data. One photo should be taken from the same place on each visit and will capture some of the waterbody and surroundings. Other features where photos would be useful are highlighted with the camera icon.

General Ecosystem Observations

Dominant land use within ~50m (tick all that apply)

Woodland Moorland/heath Urban residential Industrial/commercial Parkland/gardens

Grassland/pasture Agriculture (crops) Tilled land Other: _____

Dominant bankside vegetation (tick all that apply)

Trees/shrubs Grass None (impermeable surface) None (bare earth)

Problem plant species (tick all that apply)

Himalayan balsam Japanese knotweed Giant hogweed Skunk cabbage Curly waterweed Floating Pennywort

None Other: _____

Wildlife spotted (tick all that apply)

Otter Dipper Water vole Kingfisher None Grey Wagtail

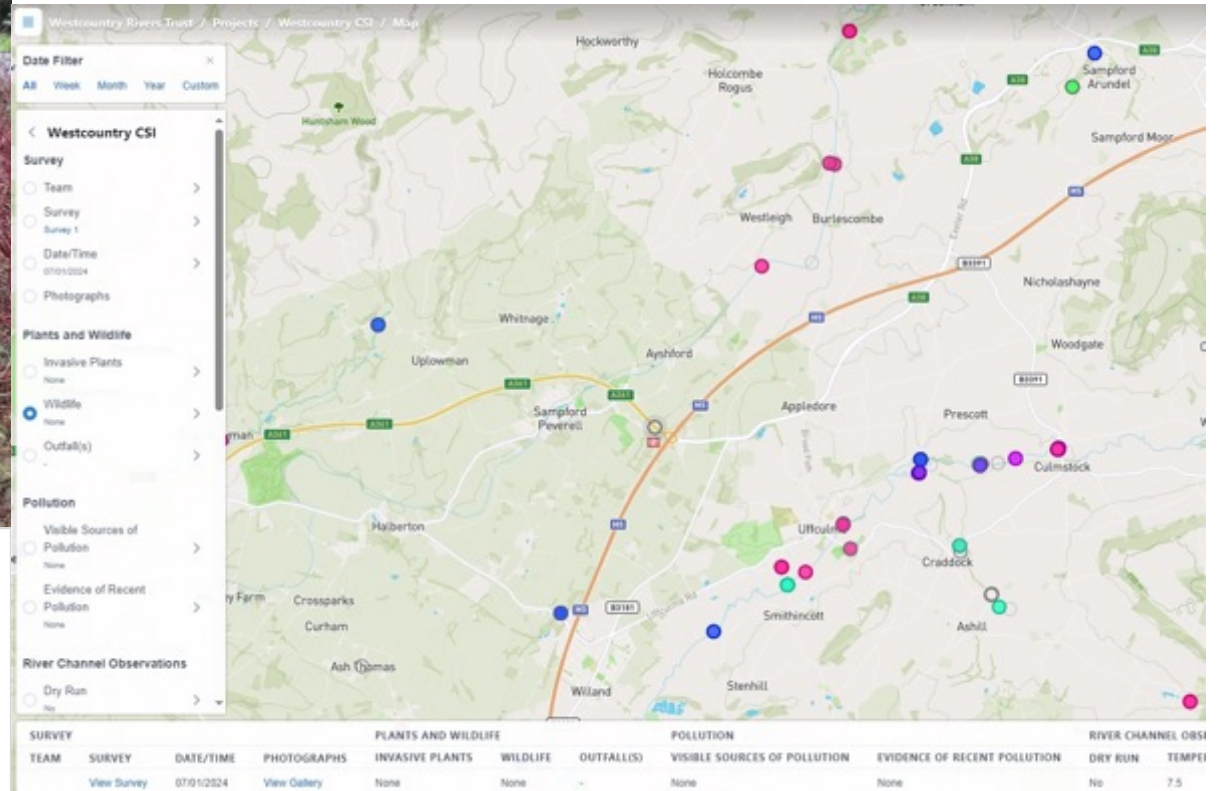
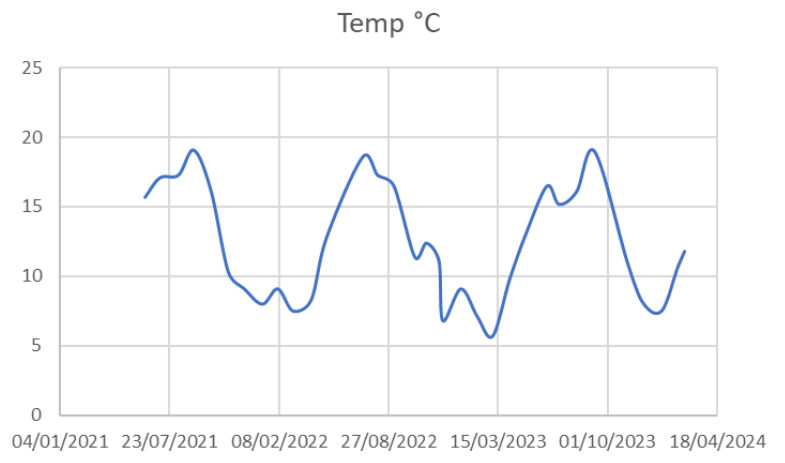
Heron Dragonflies/damselflies Fish

Other: _____

If you see any of the following, call the Environment Agency 24-hour incident hotline 0800 80 70 60: Pollution to water or land, damage or danger to the natural environment, dead fish or fish gasping for air, collapse or badly damaged riverbanks.

WESTCOUNTRY RIVERS TRUST

CSI sampling of the Spratford Stream at TVP



Water level (stage) vs water quality variables

