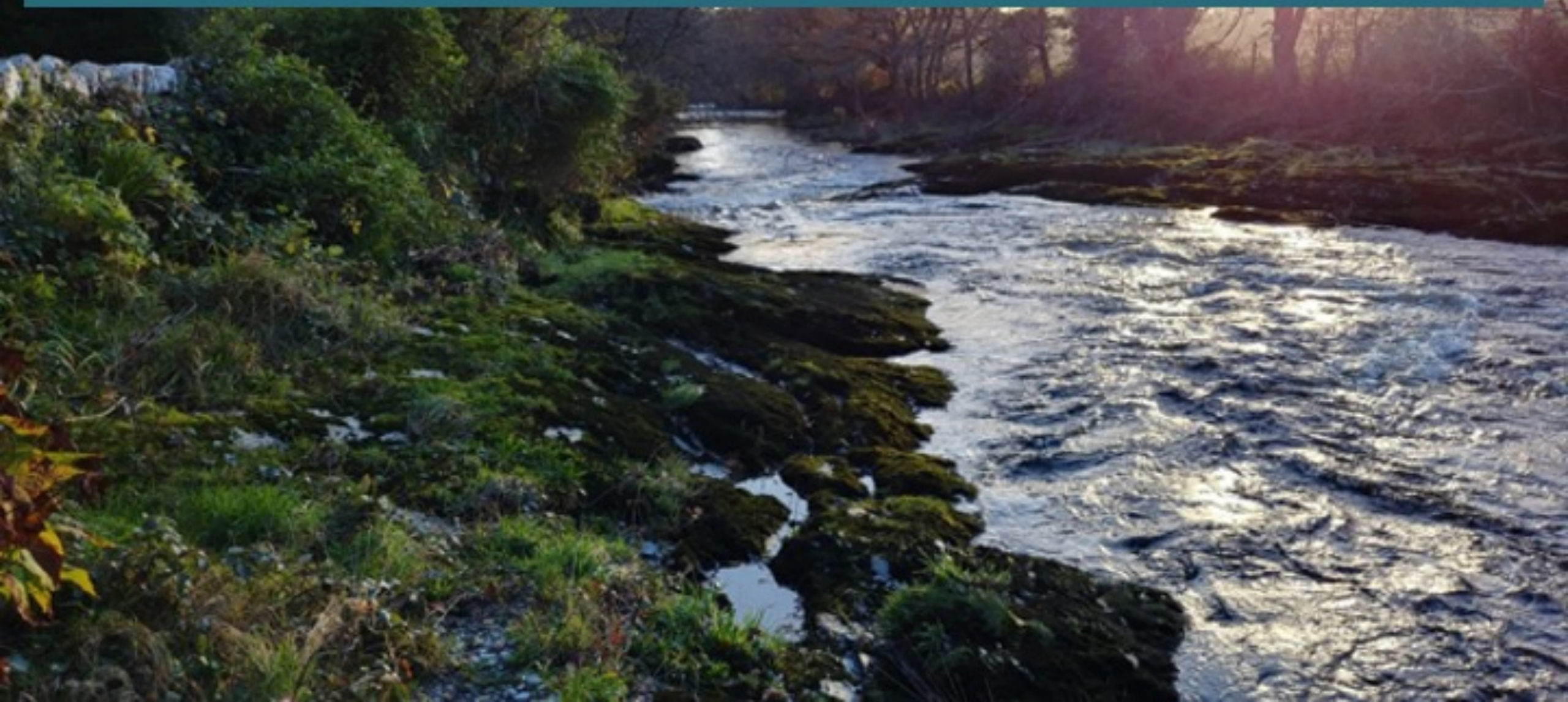


WESTCOUNTRY RIVERS

Lydia Deacon – Evidence and Engagement Officer

wrt.org.uk



Westcountry Rivers Trust

Believers in the "provider is paid" principle

wrt.org.uk



"Working throughout the South West to help restore and protect the water environment in the Westcountry for the benefit of people, wildlife and the local economy"

- Land management advice
- On-farm measures
- Minimising pollution at source
- Maximising farmer efficiency
- Enhancing ecological health

- Bankside and in-river habitat works
 - Gravel cleaning
 - Fish pass
 - Tree coppicing
 - Bank erosion measures
- Fish surveys and rescues



- Risk assessments
- Modelling
- Monitoring
- Reporting
- Citizen science programme

- School and university visits and workshops
- GIS courses
- Educational talks
- Internships

Importance of Rivers

wrt.org.uk



Recreation



Habitat



Drinking Water



Food



Wellbeing



Flood Defence



Hygiene



RURAL ISSUES

wrt.org.uk



Slurry spreading before heavy rain



Fine sediment from soil erosion



Soil compaction



Macro/micro plastics



Pesticide application



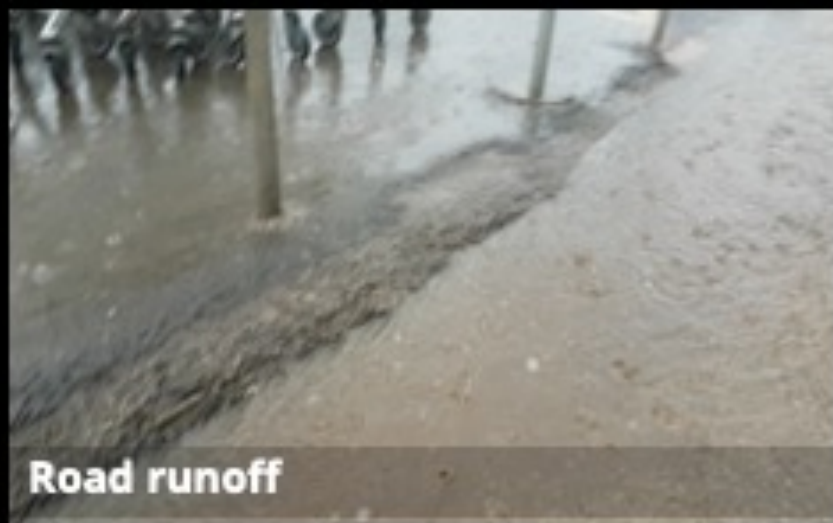
Stock access to rivers

GOOD FARM BAD FARM



URBAN ISSUES

wrt.org.uk



Road runoff



Sewage discharges / sewer overflows



Barriers to fish migration



Industrial Discharge



Plastics

GOOD CITY BAD CITY







PLYMOUTH RIVER KEEPERS EVIDENCE REVIEW



PLYMOUTH RIVER KEEPERS

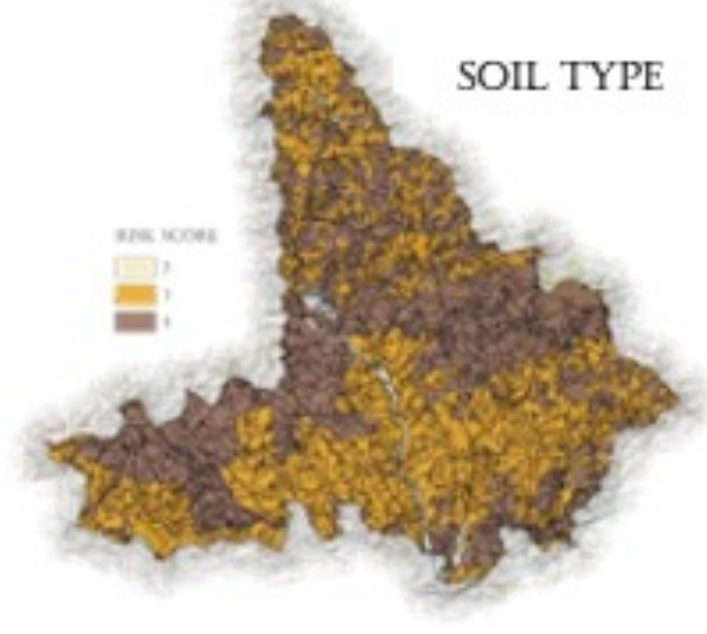
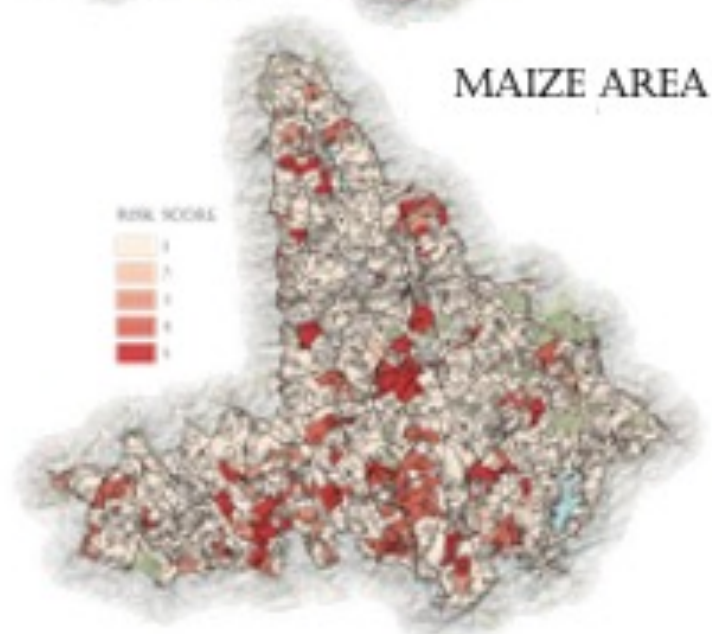
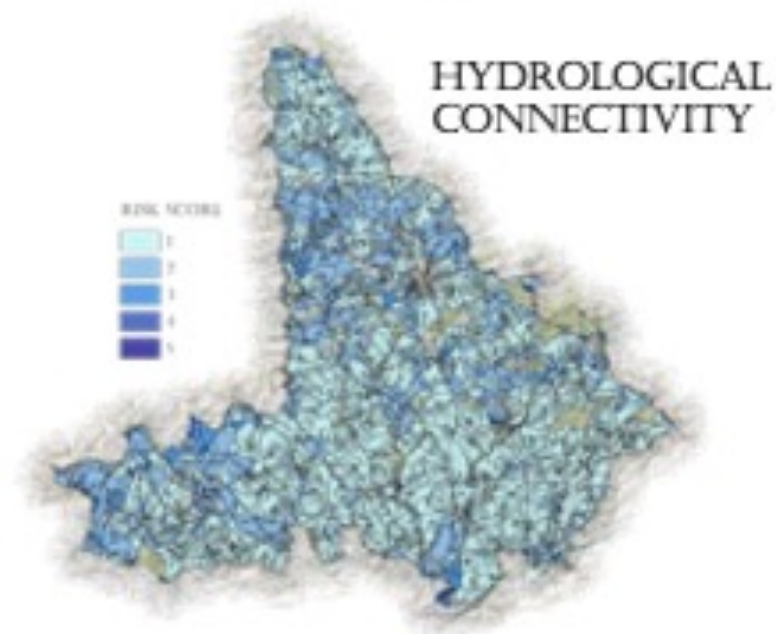
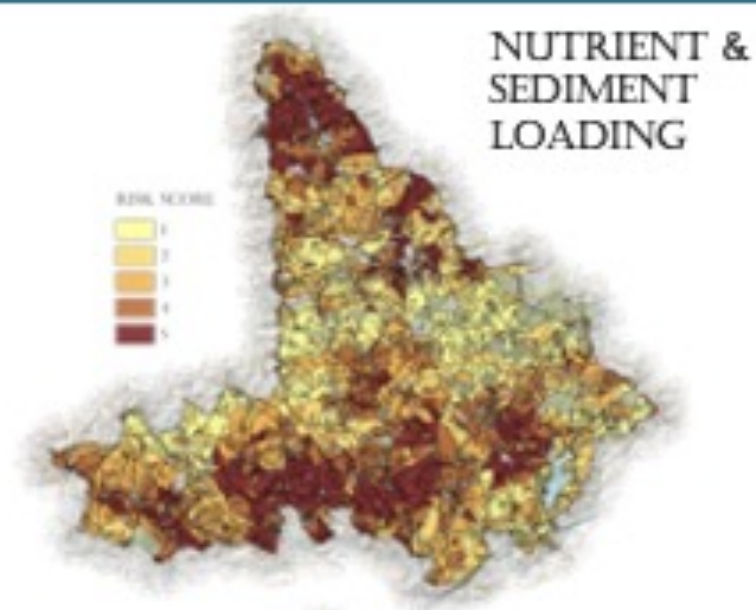
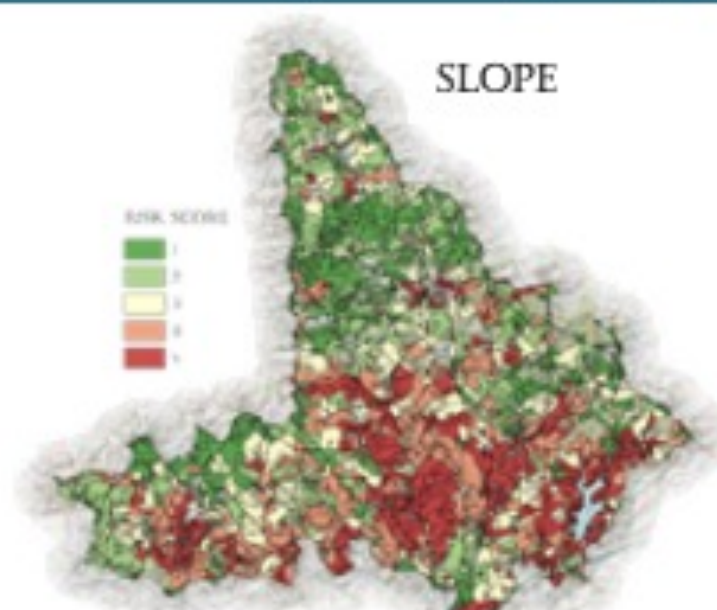
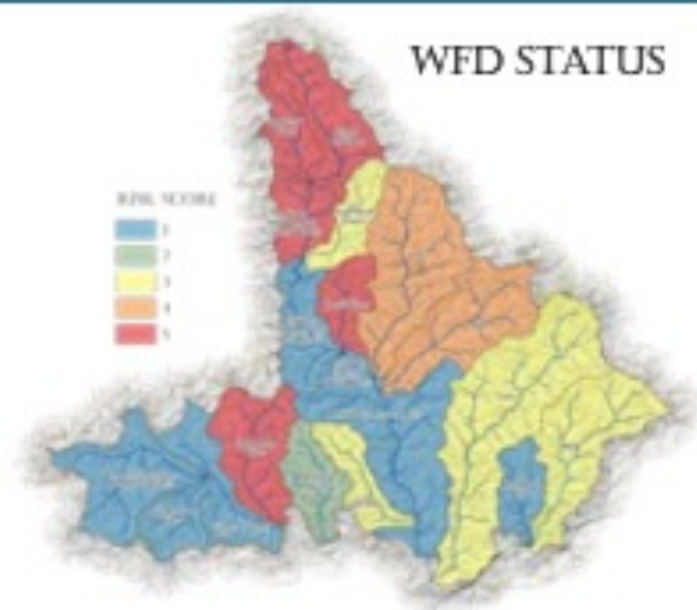
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The logo for Preventing Plastic Pollution, featuring a stylized plastic bottle and the text "PREVENTING PLASTIC POLLUTION".



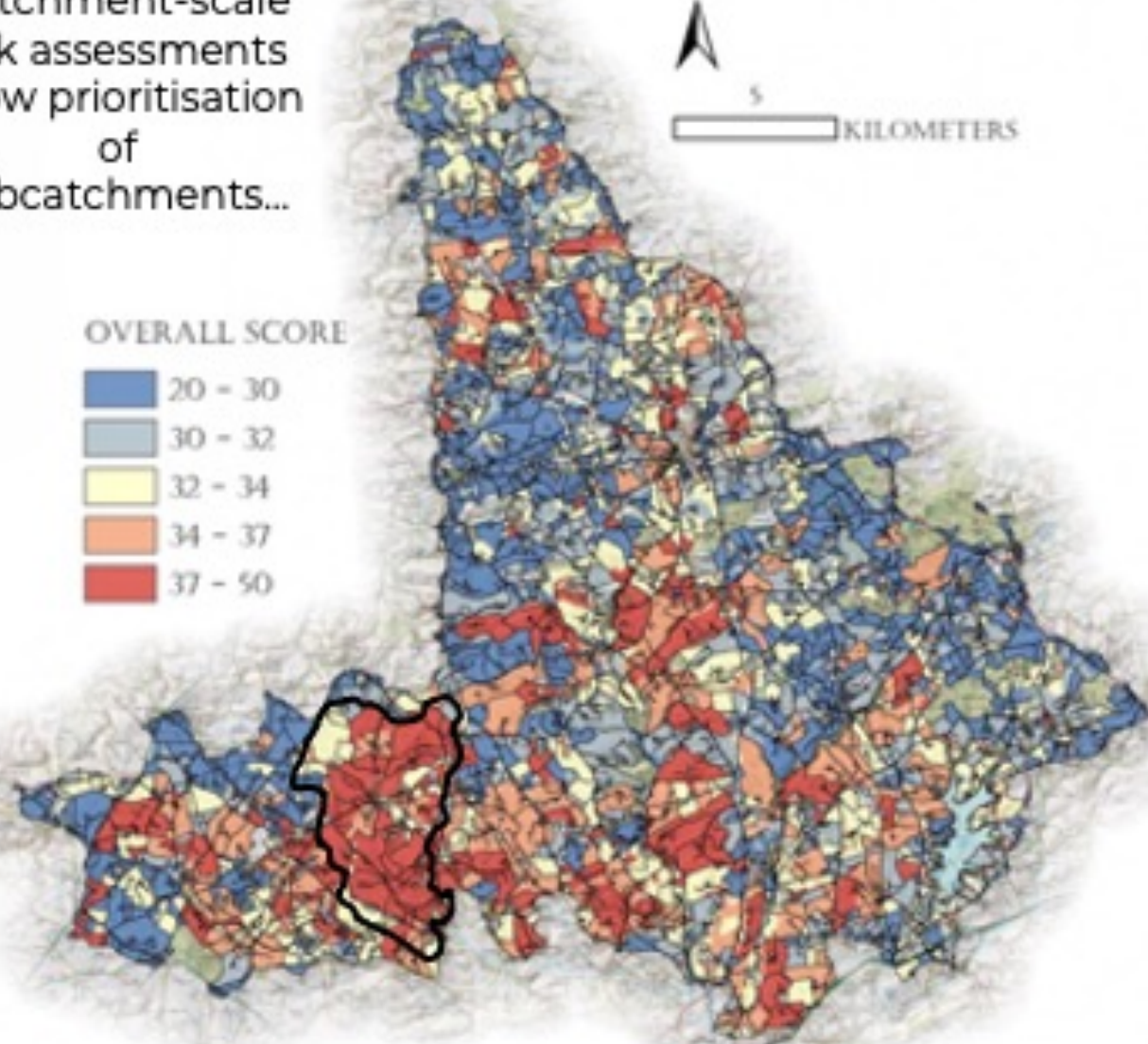
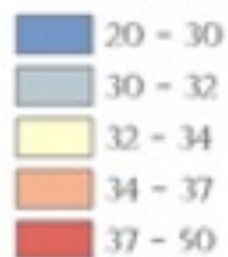
Assessing Risk helps target problem areas...



...and informs further risk modelling at higher resolution

Catchment-scale risk assessments allow prioritisation of subcatchments...

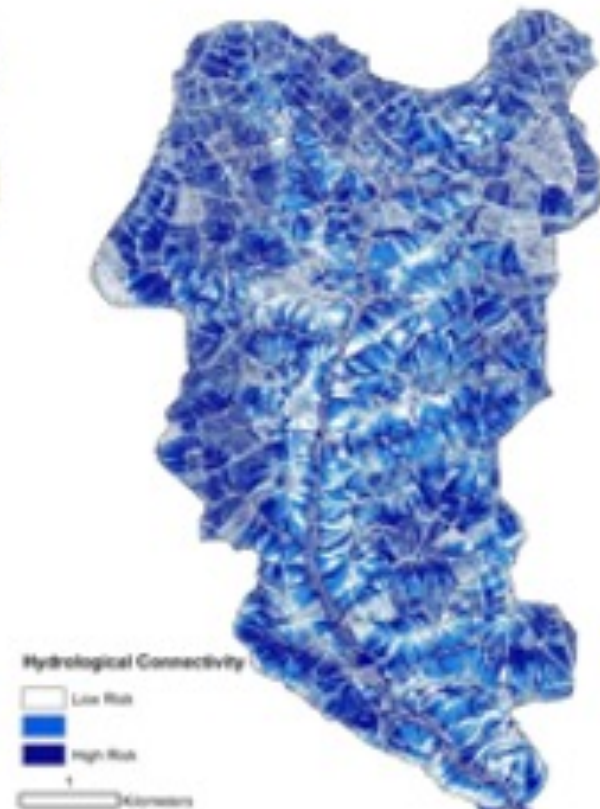
OVERALL SCORE



SCIMAP

Erosion Risk

Hydrological Connectivity



...and SCIMAP undertaken on a subcatchment or even farm-scale can identify specific areas requiring interventions



Spot sampling



Continuous in- situ monitoring



Telemetered options

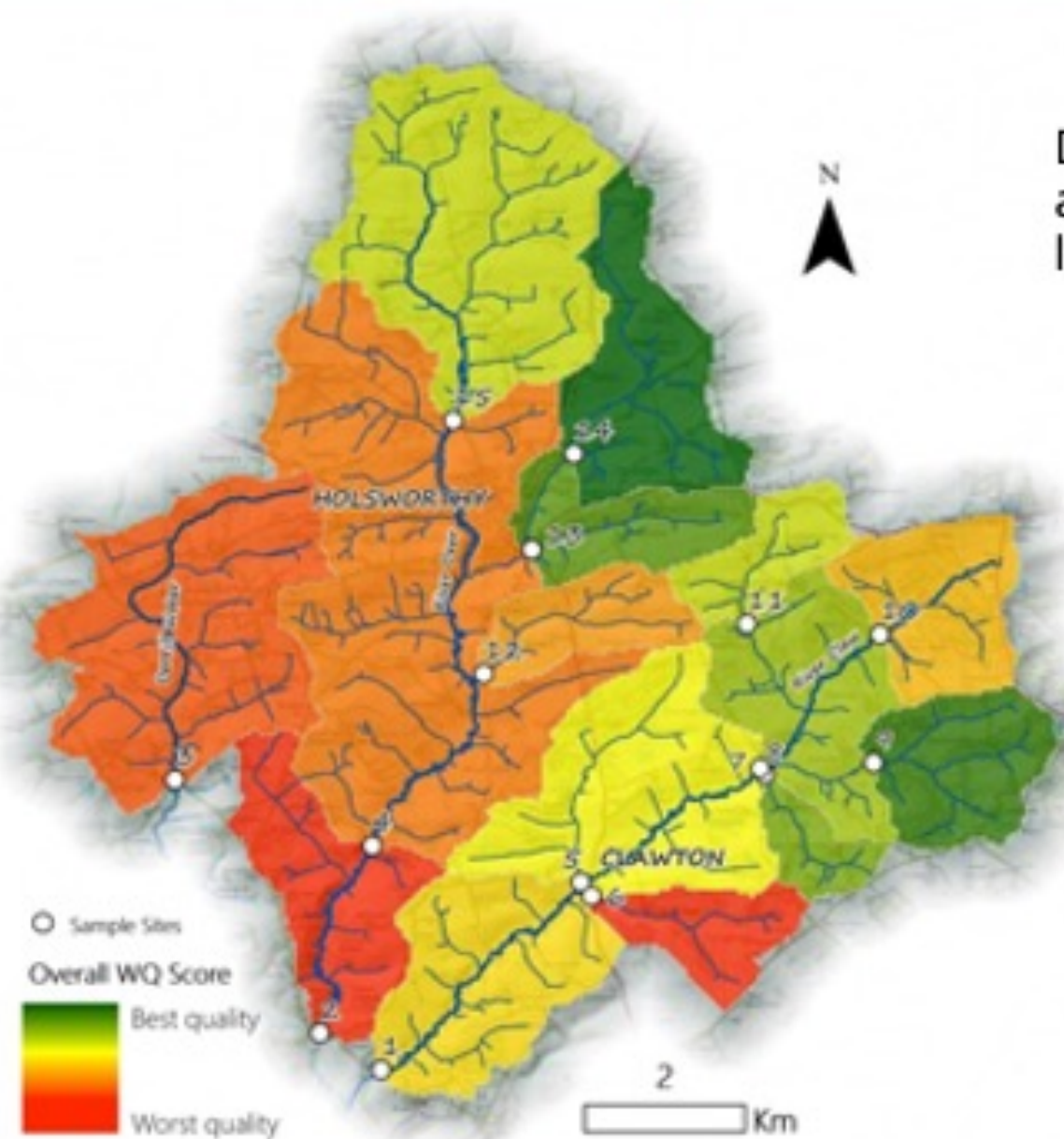


Historic surveys



Monitoring allows pollution **identification** and **quantification**

Detailed spot sampling allows quantification of pollution and thus prioritisation of sub catchments to guide landowner engagement...



Site No.	River	Site	EC	TURB	PO ₄	COL	TRYP	CDOM	OBA	OVERALL
6	Beer Stream	Clawton	14	10	12	10	13	14	14	12.4
3	Derril Water	Yeomadon	11	14	14	15	14	6	8	11.7
2	Deer	North Tamerton	15	15	15	14	12	2	7	11.4
10	Claw	Higher Claw Bridge	5	9	3	11	10	15	15	9.7
12	Chasty Stream	Ratherton	12	8	8	5	15	9	11	9.7
1	Claw	Telcote	9	11	4	12	7	10	9	8.9
4	Deer	Forda Mill	13	12	13	9	11	1	3	8.9
5	Claw	Clawton	3	13	9	13	1	11	10	8.6
11	Hollacombe Stream	Hayne Barton	10	1	10	1	9	12	12	7.9
7	Claw	Claw Bridge	1	7	5	8	2	13	13	7.0
15	Claw	Gulliver Bridge	7	6	11	4	8	5	5	6.6
8	Middlecroft Stream	Clawford Cross	2	3	6	6	4	7	6	4.9
9	Arscott Stream	Hayford Plantation	6	5	1	7	3	8	4	4.9
14	Lamerton Stream	Lamerton	8	4	2	3	5	3	2	3.9
13	Southcombe Stream	Cole's Mill Bridge	4	2	7	2	6	4	1	3.7



Data is used to help **inform** and **engage** landowners



This benefits the environment as well as the farmer/landowner's business













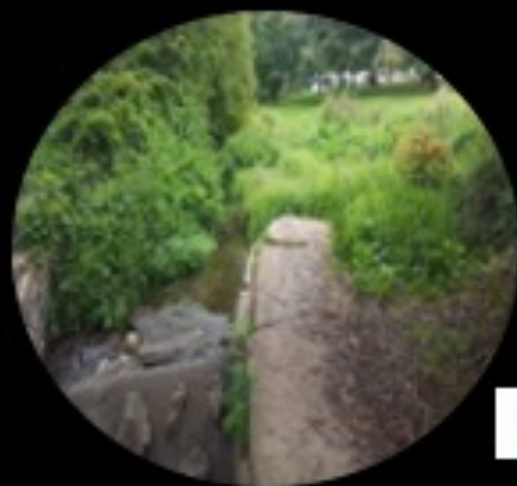


Creating connection

Importance of biodiversity

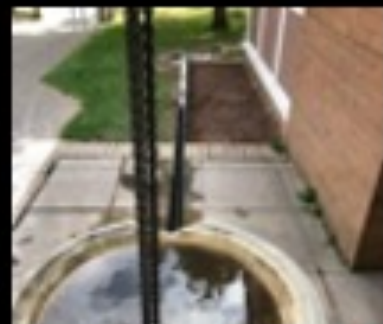


Ecosystem services



Highlighting hidden rivers

Climate resilience - water resources







WESTCOUNTRY WOMEN WORKING WITH WATER (5W)

5W and a group of engineers from the University of the West of England and University of Exeter worked with groups of school children in Taunton over a year to inspire them to undertake a little more about water management in their town. They then used their new knowledge to help design SuDS which were built in their schools.

Objectives: Working Working With Water (5W) was a project funded by The Royal Academy of Engineering under their Inspire program, working with two primary schools in Taunton. The project successfully undertook the following exciting and important aims:

1. To get young people, especially girls, interested in engineering and understanding a little more about the wide range of jobs engineers work in, and the important social and scientific engineering can help to solve. In particular, the project focused on how water is managed in towns and cities.
2. To give engineers the opportunity to talk about their exciting work to new groups of people, and allow them to try a range of engagement techniques.
3. To build two new rain-gardens at the schools, designing the features with the help of the school pupils, teachers and parents.

The project was run through a series of educational and interactive sessions, led by the engineers.

The first aimed to get the pupils thinking about where the water from their home and town goes, how it is managed and how rain and green spaces can play a role in managing water. The engineers ran a range of interactive activities, including making a rain gauge to measure rainfall. The session also had a chance to ask the engineers questions, including how they get into engineering, what their favourite part of their job is, and what they think is the best thing that's been invented by engineers.

The second session got the pupils thinking about how water moves around the school and gathered the ideas of the students and their parents for the SuDS to be installed in the school grounds.



TRADITIONAL DRAINAGE vs SuDS

These interactive boards were used to demonstrate the difference between traditional water management systems and sustainable drainage systems. In the board on the left, water goes down a gutter, into a pipe that carries it down a drain and into the 'real' gutter. The water goes through the gutter very quickly, eventually flooding the legs (lower level). On the right, the water goes into a buffer (acting as a water butt), through some permeable paving, into a grassy area and then into a rain-garden. The water moves more slowly, plus the board looks a lot more green and interesting.



HOLWAY PARK PRIMARY SCHOOL

Holway Park has a courtyard in the centre of the school which is home to a future pond. Previously, the pond had to be topped up from the tap - a tedious process which uses a lot of tap water. A sustainable harvesting system now stores rainwater from the roof-top and allows it to be used to keep the pond topped up. A real garden takes water from the other courtyard drainage, feeding it through an attractive 'flow' feature and through the plant pots, allowing the flow of the rainwater to the drain and providing colour and scent to the area.

LYNGA GIRD PARK PRIMARY SCHOOL

The main school building at Lyngard Park has all their drainage and gutters built into the structure of the building, creating a challenge for rain-flow. SuDS features, including the drain at the front of the school, tap a gutter and drainage, which has been used as the start of a SuDS system around the front of the school. Rainwater flows down a rain-chain and into a stone basin which has been adapted into a rain-pond feature. Other water overflow is taken along a rain-fall alongside a water stream. It then flows along a cobble channel and into a culvert drainage, where the rainwater soaks into the ground.



DELIVERY



18 lessons, workshops and planting sessions 150 pupils, parents and teachers involved

PREVENTING PLASTIC POLLUTION (PPP)

wrt.org.uk



Mapping and Data Analysis



Installation of Angling Recycling Bins



SME Plastic Reduction Charters

Westcountry Rivers Trust are offering free services for SME's willing to remove/reduce/reuse plastic through their supply chain in Cornwall and Devon. Engaged SME's will have access to all the core services and one tailored service (listed below):

Core services:

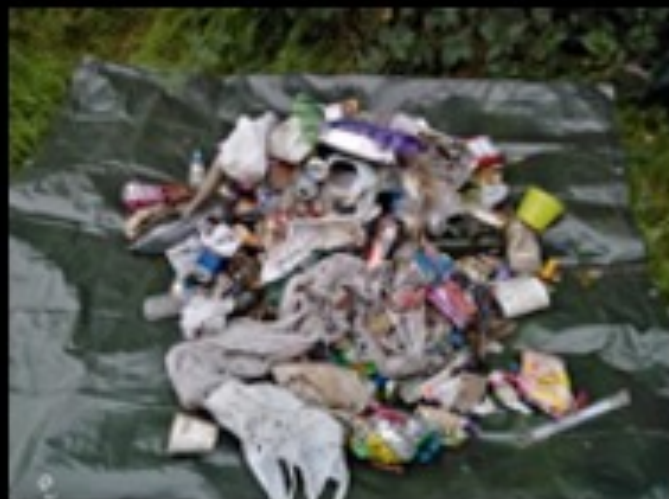
- 2 x social media mentions
- 1 x logo appearance on WRT film on PPP.
- 3 x window stickers
- *1 x logo on website

Tailored services (select one):

- 1 x waste audit and follow up plastic solution consultation
- 1 x tailored plastic advice consultation (Plastic chartership signup/alternative products etc.)

*= TBC

If you are/know an SME interested in taking action on plastic, please get in touch with perry@wrt.org.uk.



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European Regional Development Fund

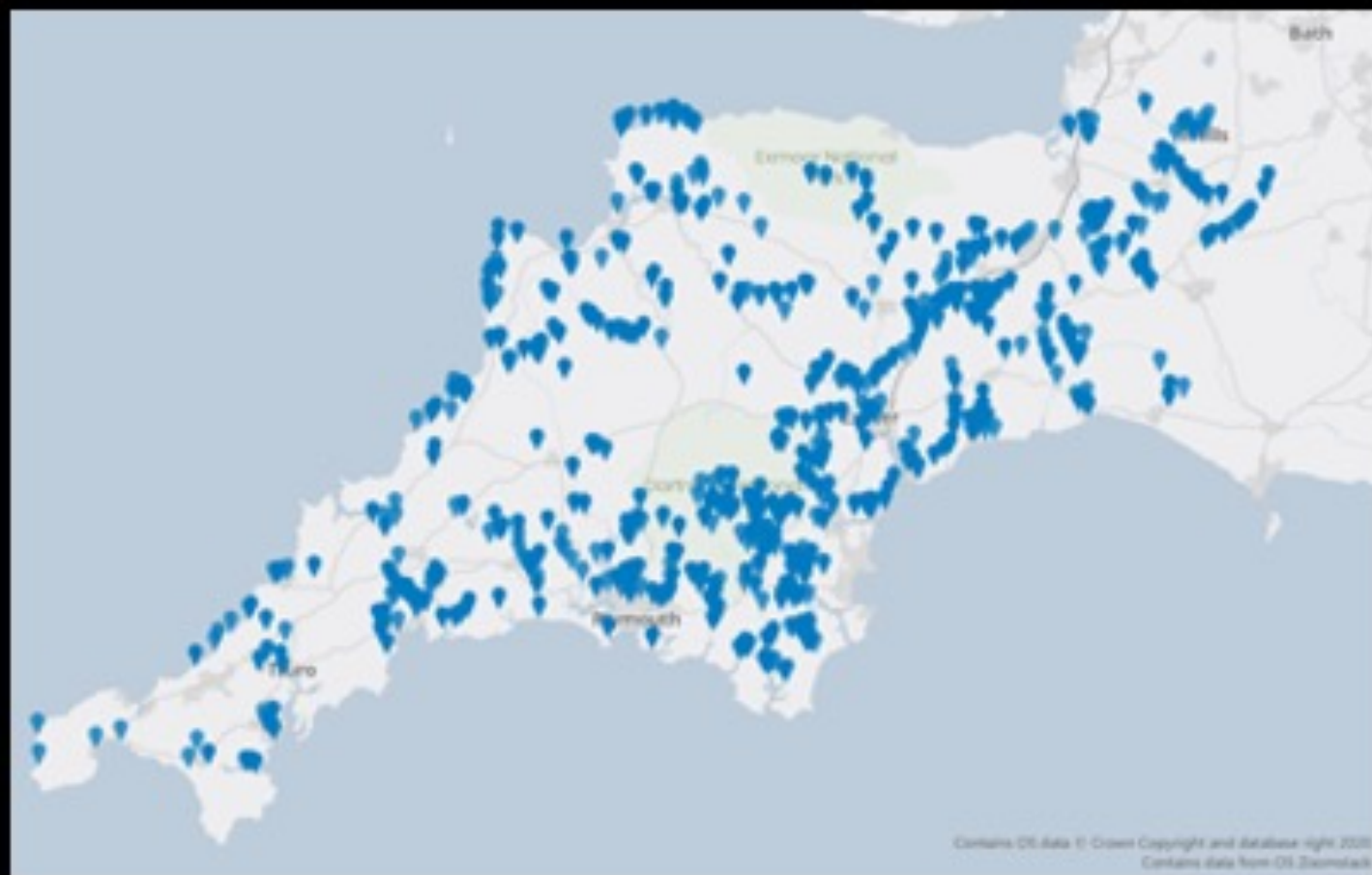


**PREVENTING
PLASTIC POLLUTION**



Aims:

- To educate and engage people with the water environment.
- To produce data that can be used to target work and identify degrading water bodies.
- To spot pollution events which can be dealt with as quickly as possible.
- To create a network of catchment communities that are invested in their local environment.



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Contains data from OS Ziemstad

WHAT IS RECORDED

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Total Dissolved Solids (TDS) Meter



Turbidity Tube



Phosphate Strip being inverted in sample



Phosphate Colour Chart

Westcountry C.S.I.
Citizens Science Initiative

Survey Details
Survey location: _____ Grid Reference: _____
Name of waterbody: _____
Date: _____ Time: _____ Observer Name: _____

Type of Waterbody (tick one)
 River Stream Lake Pond Estuary/Inlet
 Other: _____

Rain in previous 24 hours (tick one)
 None Light showers Heavy or prolonged rain

General Ecosystem Observations
Dominant land use within ~50m (tick all that apply)
 Woodland Woodland Heath Urban residential Industrial/commercial Parkland gardens
 Grassland pasture Agriculture (arable) Tidal land Other: _____

Dominant herbicide vegetation (tick all that apply)
 Thistle/ruderal Grass None (impermeable surface) None (bare earth)
 Other: _____

Problem plant species (tick all that apply)
 Himalayan Balsam Japanese Knotweed Giant Hogweed Shrub cuttings Gully waterweed
 None Other: _____

Wildlife spotted (tick all that apply)
 Otter Minnow Water vole Kingfisher Grey Heron
 Heron Dragonfly/Libellula Fish None Other: _____

If you receive any of the following, call the Environment Agency on free helpline 0800 80 50 50. Inclusion in water or land drainage in England is the responsibility of the water undertaker. Don't put it in a gully for an address of health, drainage or water.



csi@wrt.org.uk

CSI SCORECARD 2020



Westcountry CSI Scorecard 2020 Lower Culm, East Devon



River Health Scale

A	Excellent
B	Good
C	Fair
D	Poor
E	Very Poor

The overall score for the catchment is based on a year's data, collected at all sites in the Lower Culm waterbody. It is calculated from the observations and water quality results attained during a Westcountry Citizen Science Investigation (CSI) survey. A waterbody has to have at least 12 samples taken over the year for it to qualify for a scorecard.



LOWER CULM 2020
57%
Overall grade



DS Dissolved Solids are measured using a handheld TDS meter. DS increase as a result of natural and anthropogenic inputs of things like chemicals, slurry, sewage or salts into the waterbody.

SS Suspended Solids or Turbidity is measured using a turbidity tube. SS increase as a result of increased soil erosion, mine discharge and road runoff. An increase in SS reduces water clarity, making it difficult for aquatic organisms to survive.

POL The Pollution score is calculated from the observations of pollution sources and evidence of recent pollution (e.g. litter or oil). These give an indication of the pollution pressures on that watercourse.

ECO The Ecology score is calculated from wildlife and problem plants spotted. Wildlife spotted near a river, indicates that the river is supporting a healthy food chain. Problem plants reduce this score as they can cause issues for the biodiversity of the watercourse by shading out other plant species.

PO₄ Phosphate (PO₄) is a vital nutrient for the healthy growth of all organisms and is found in natural and artificial fertilisers, sewage and industrial wastes. Natural levels are very low and thus any measurable phosphate observed is likely due to anthropogenic influences such as misconnections, farm runoff or industrial discharge. PO₄ is measured using strips which turn blue in the presence of phosphate.

Catchment Summary

The Lower Culm waterbody is located in East Devon with its main centre of population being Cullington. There are ten sample points and eight active samplers in this waterbody, with 31 Westcountry CSI surveys taken in total during 2020.

The predominant land use within 50m of these sites is grassland or pasture (20) and agriculture (16), urban residential (8), parkland/gardens (8), woodland (6) and industrial/commercial (3). The bankside ecosystem varies between trees or shrubs (24), grass (18), impermeable surface (5) and bare earth (2).

There have been frequent observations of the problem plant Himalayan balsam (10) and wildlife sightings of fish (4), dragonflies/damselflies (2), a heron, Aquatic invertebrates and multiple species of bird have also been spotted during surveys. The pollution pressure come from road runoff (7), soil runoff (2), collapsed riverbank (2), cattle/stock access to river (2), inactive outfall (2) and farm runoff (slurry stage) (1). Observations of recent pollution come from foam (13), litter (3) and smothering algae (1).

Water Quality Test Results



How to Use This Scorecard

The Westcountry CSI scorecards are produced to visualise the data collected by the volunteers across the Westcountry and to give an idea of the health of our rivers and streams. Due to the nature of the scheme and the COVID 19 lockdown, there are gaps in the data. It should be noted that none of the sites across the catchment were sampled more than 12 times. Numbers in brackets in the catchment summary indicate the number of sightings of each species observed throughout the year.

Become a Westcountry Citizen Science Investigator!

Join Westcountry CSI and help to monitor a river or stream in your local area. To find out more and get in touch, visit our website: wrt.org.uk/projects/become-a-citizen-scientist or email us at csl@wrt.org.uk.

About Westcountry Rivers Trust

The Westcountry Rivers Trust is an environmental charity (Charity no. 1125007, Company no. 0654564) established in 1995 to secure the preservation, protection, development and improvement of the rivers, streams, watercourses and water impoundments in the Westcountry and to advance the education of the public in the management of water.



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HOW CAN CSI HELP?

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Mental health and wellbeing:

- Rivers and natural environments have a proven positive effect on our health and wellbeing.
- Good excuse to get out!

Pollution Spotting:

- Network of educated 'eyes, ears and noses' able to spot pollution and report.
- A growing number of cases of CSIsers pursuing change.

"Hopefully we have solved the source of cheese waste at the factory now the land drain has been removed and the repair completed in the factory where the effluent was getting into the ground water."

North Devon Environment Officer (EA)



"Any evidence of impact of any kind related to the SWW Menagwins discharge is valuable (observations/photos of rag, discolouration or CSI reports) ... and we will consider this as part of our ongoing compliance investigation into this site."

Compliance Investigation (EA)



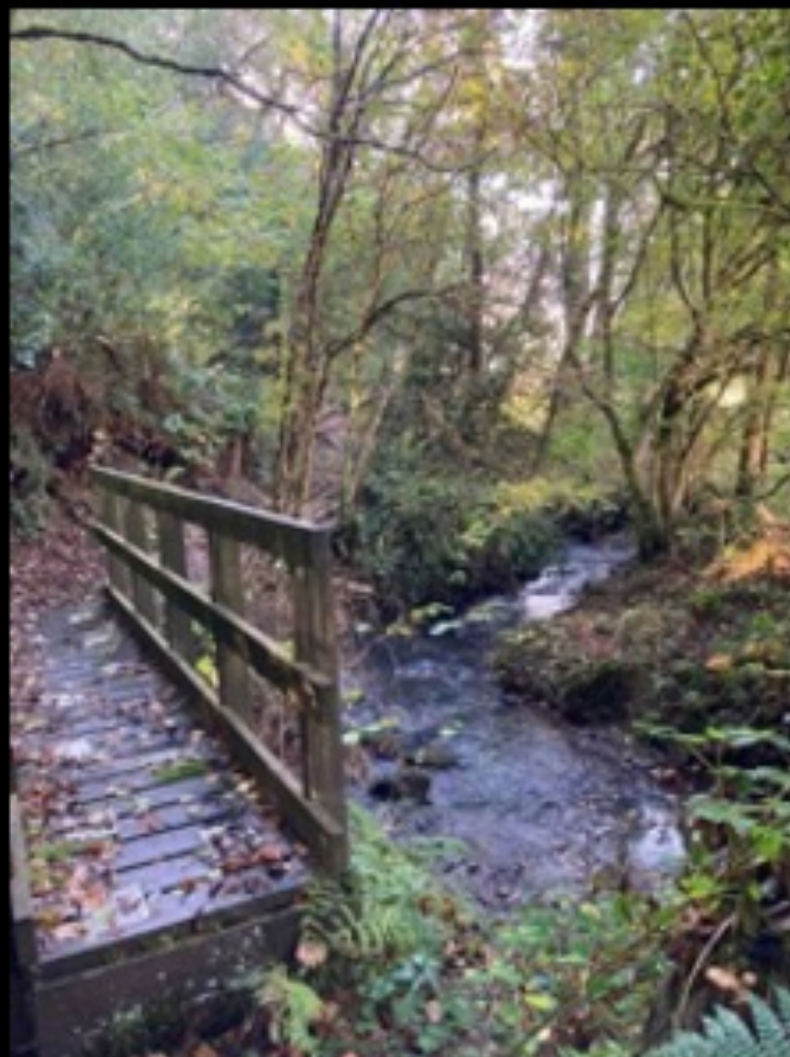
HOW CAN CSI HELP?

wrt.org.uk



“Taking part in the WRT CSI project has been incredible. I originally signed up thinking it would be interesting to see what state our parish’s watercourses are in... but crikey it has been so much more. Now I reflect that it has given me the opportunity to REALLY observe a local patch through the different seasons, to immerse myself in nature and spend some time to listen to the water babbling, trickling or stopping... and to understand the critical role our watercourses play in connectivity for nature. But it has also allowed me to feel a glimmer of hope and ownership of being part of a group of people who are keen to make a small difference and this fights my eco anxiety. Thank you WRT for creating such a brilliant citizen science project.”

Kate Morley – CSI Volunteer, Culver Brook, East Devon



7 WAYS TO HELP YOUR RIVER



wrt.org.uk



7 WAYS TO HELP YOUR RIVER



- 1. Find your nearest brook, stream or river**
- it may be closer than you think!
- 2. Help to hold rainwater where you can**
- reduce run-off
- 3. Use water wisely**
- it's on loan from the rivers
- 4. Be careful with chemicals**
- there is no 'away'
- 5. Pick up litter**
- every bit taken out of the environment counts
- 6. Only flush the 3 P's!**
- blockages are a common cause of pollution
- 7. Sign up to Westcountry CSI**
- help us to help the rivers



Thank You

Any Questions?

csi@wrt.org.uk

Check out our new CSI
manual:
<https://arcg.is/1rGbra1>



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