Chalk streams

And how to save them

Dr Sam Green

Freshwater Ecologist

sam@wildfish.org

WildFish.

WildFish.

Evidence led - using the law

Addressing causes not symptoms

Unaligned

Wild fish first - not politics

81%

The drop in freshwater species populations globally between 1970 and 2012

93%

Decline in Europe’s freshwater migratory fish populations between 1970 and 2016

Chalk streams

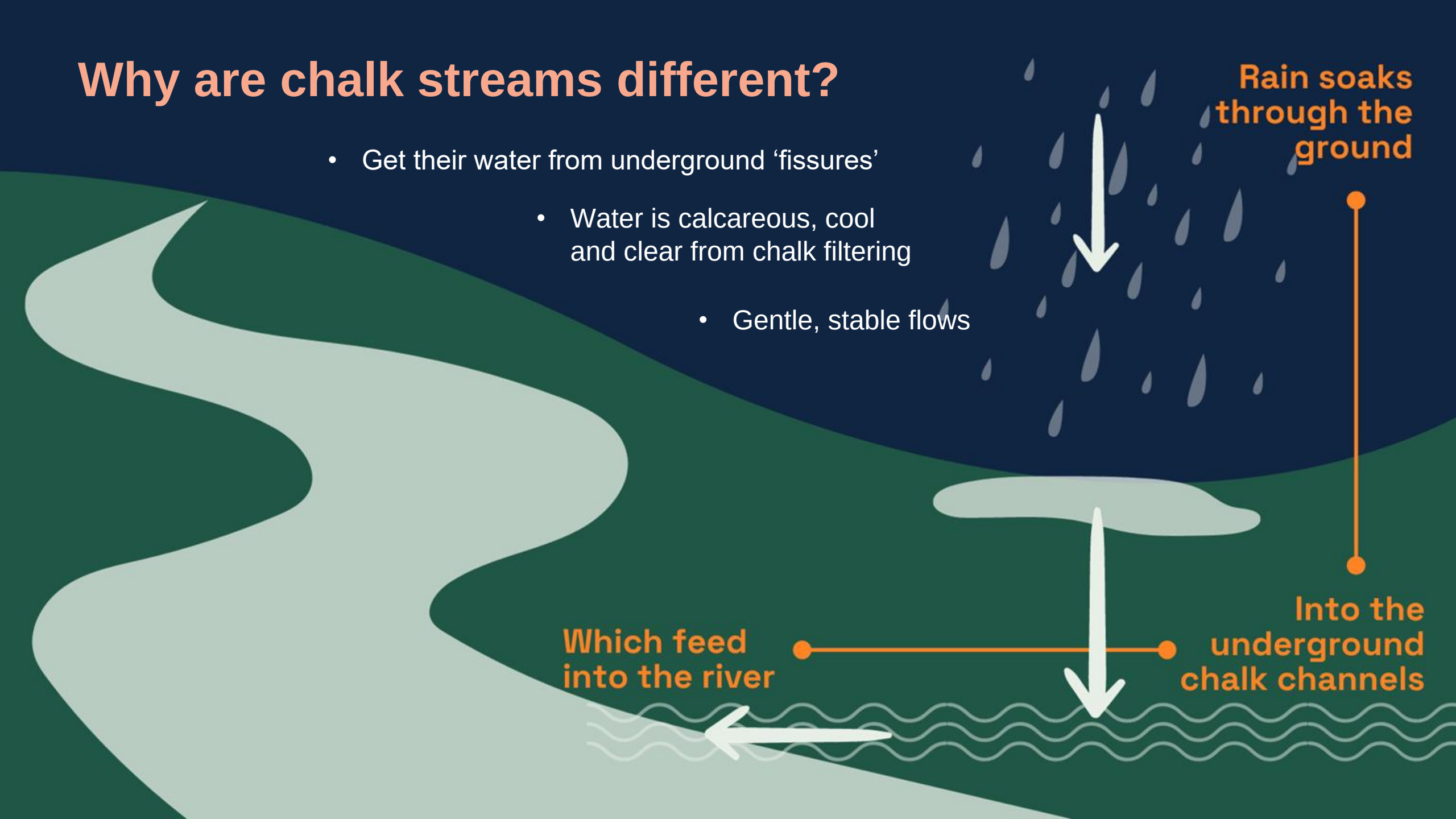
England’s natural crown jewel

This unique habitat is home to many species of fish, riverflies, birds and mammals.

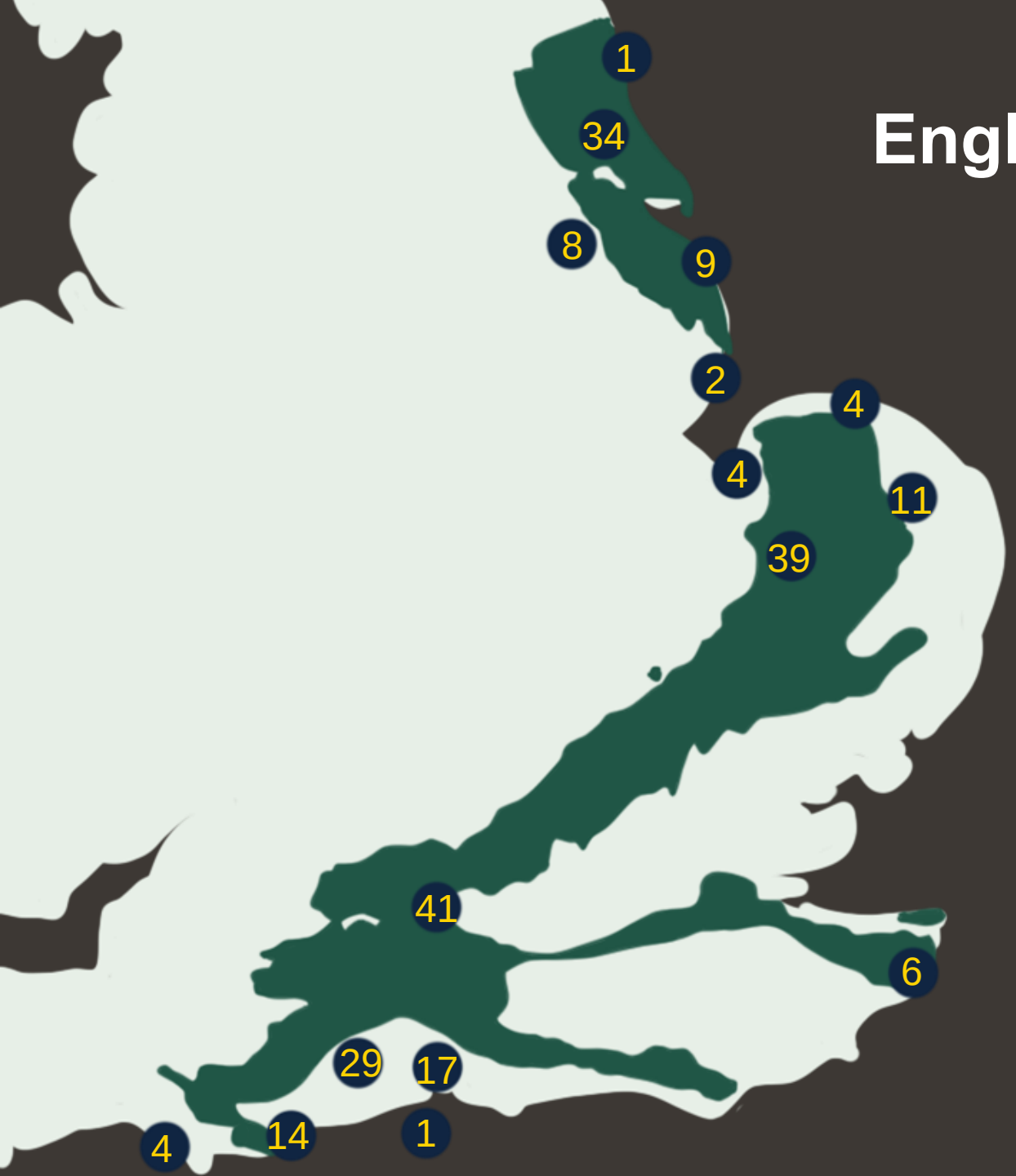
Photo: Charles Rangeley-Wilson

Why are chalk streams different?

- Get their water from underground ‘fissures’
- Water is calcareous, cool and clear from chalk filtering
- Gentle, stable flows



England’s chalk stream coverage



Chalk aquifer

Identified chalk streams in area

WWF Report 2014 – The State of England's chalk streams

Current state?

85% Of the world's chalk streams are in England[1]

14 chalk stream catchments are highly protected, **11 as sites of special scientific interest** (SSSI) and **4 as special areas of conservation** (SAC)[2]

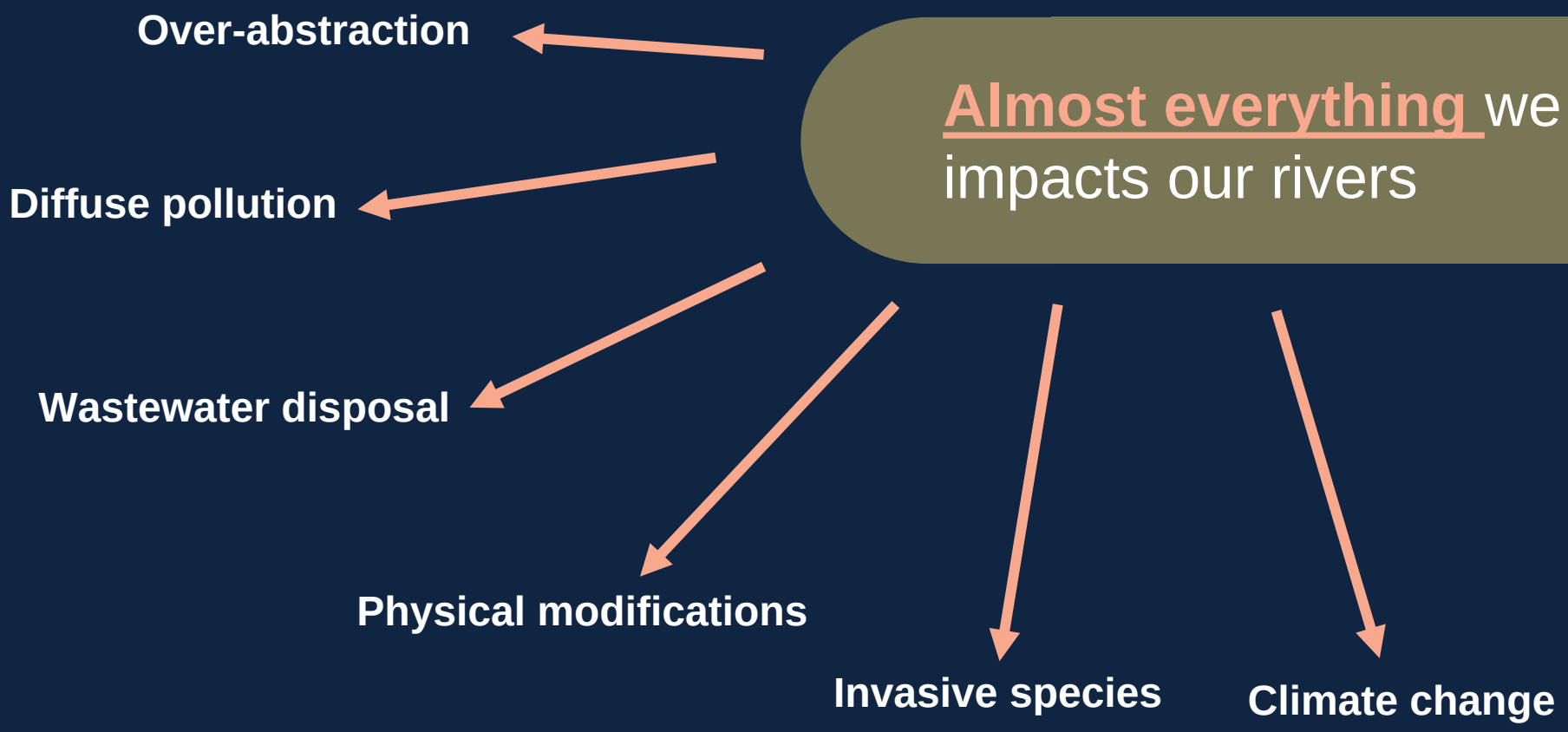
UP TO 44% **loss of mayfly species** in chalk streams compared to records from 1998[3]

Chalk streams need **clean water** and **lots of it**

We are denying them on both counts

Why is this happening?

“Death by a million cuts”



Almost everything we do on land impacts our rivers


Physical modifications

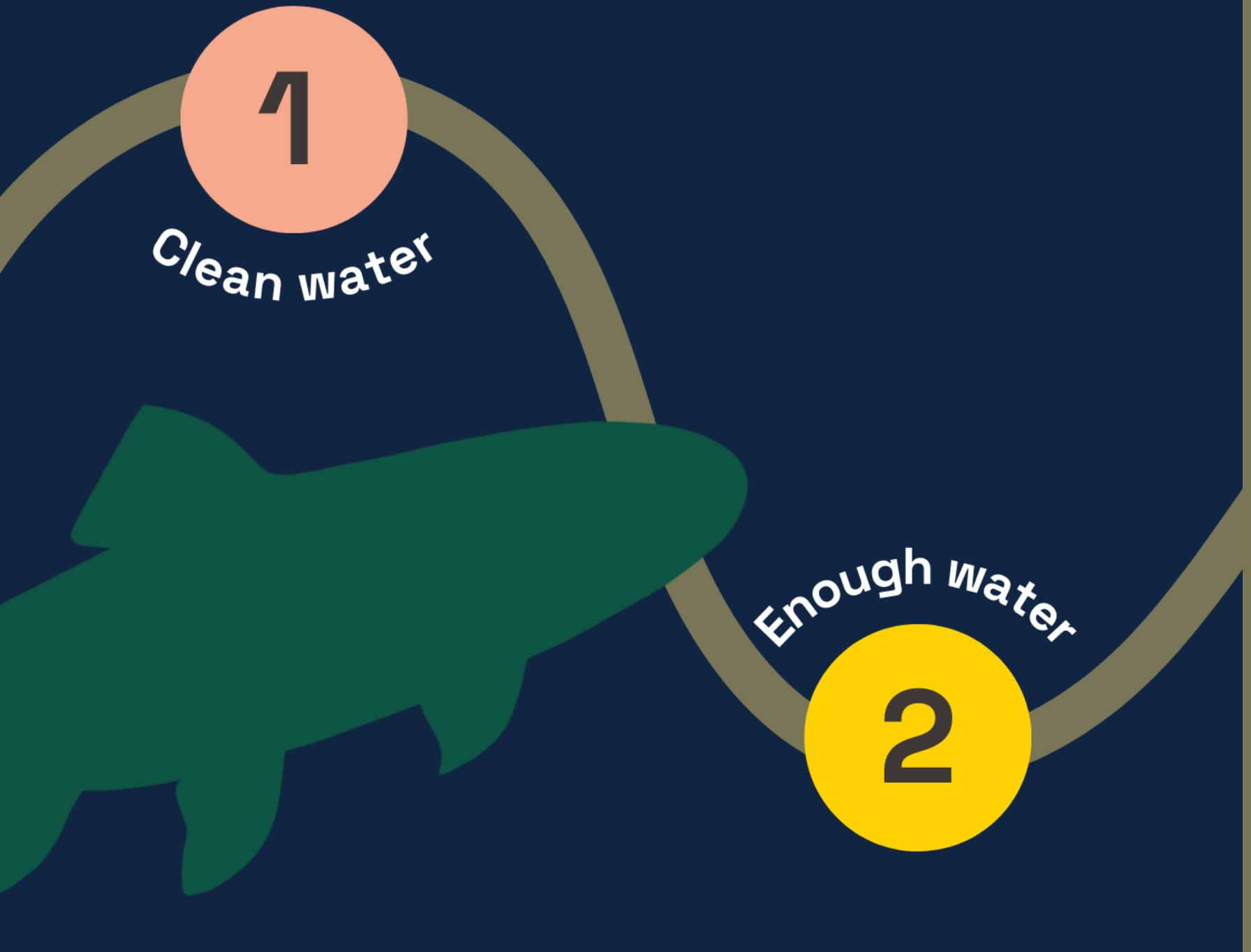

Diffuse pollution


Wastewater disposal


Climate change


Invasive species

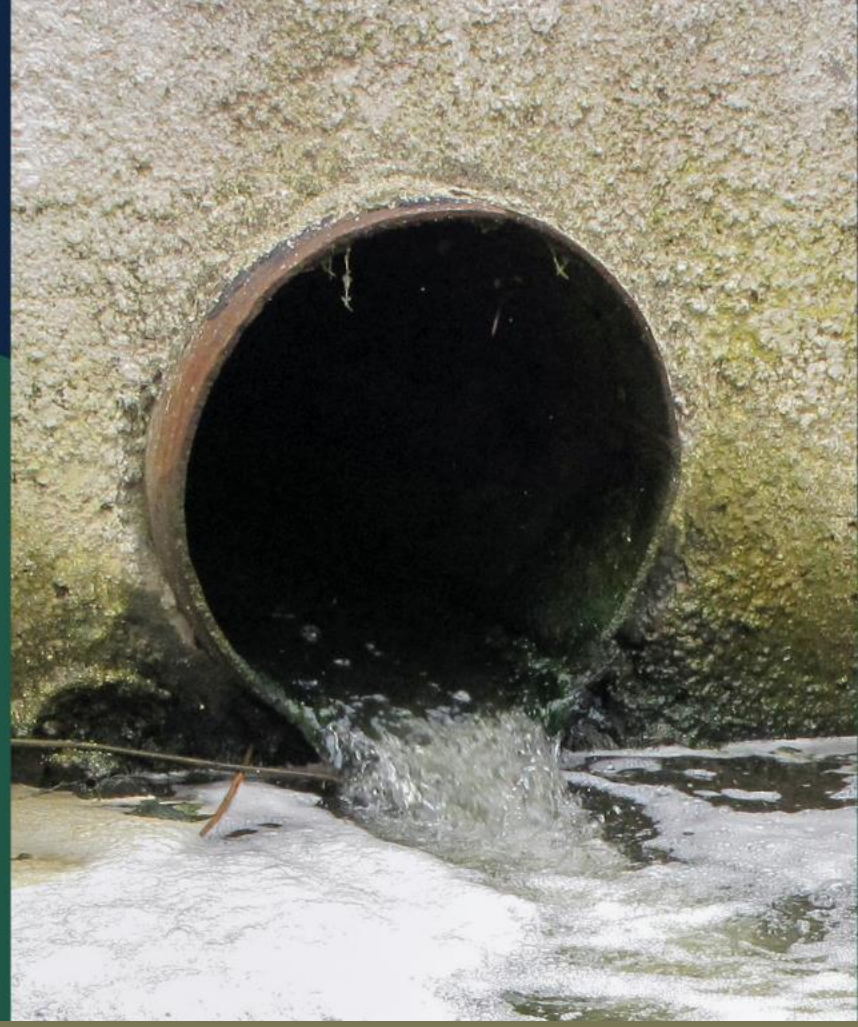

Over-abstraction



Fundamentally, chalk streams will not improve without getting these things right

1 Clean water

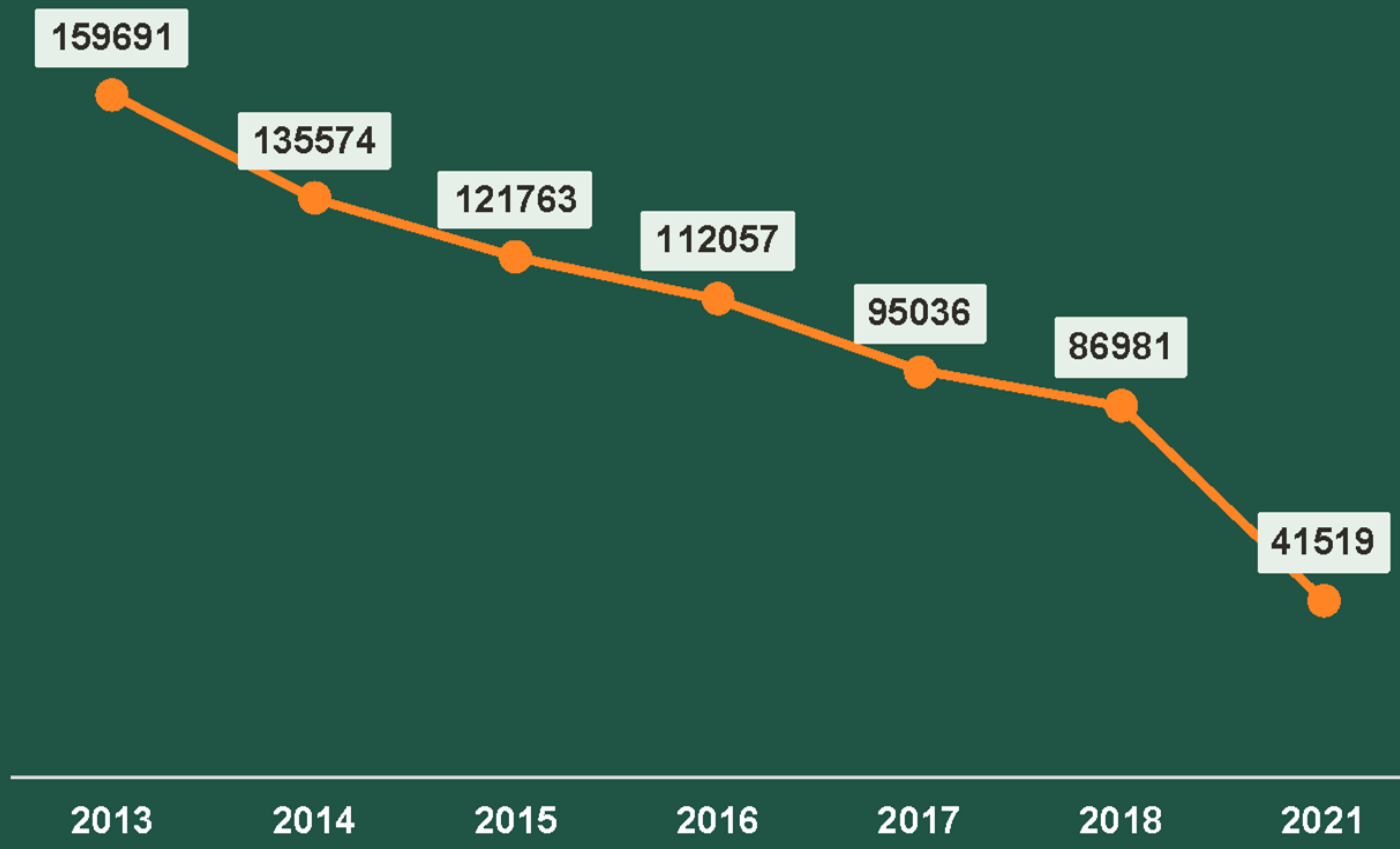
- Sewage contains high volumes of nitrogen and phosphorus. In excess, these nutrients can stimulate the growth of algae which starves freshwater species of oxygen.
- Excess sediments, nutrients and chemicals from agricultural practice seep into the water.
- Every single English river is suffering from chemical pollution.



Across the UK, **untreated sewage** is discharged into rivers **daily**

Number of Environment Agency Water Quality samples taken

**No data could be found for 2019 and 2020*



Invertebrates as indicators

Invertebrate species are quite particular about the water quality conditions they need to thrive.

Because of this, they all have different tolerances to pollution.

Inverts give a more representative picture of long-term water quality impacts than spot water samples!

High scoring species are usually mayflies, stoneflies and caddisflies

More of these species usually means **better water quality**

The information invertebrates can tell us depends on the resolution they are identified

We need species-level analysis to get a true assessment of the state of freshwater invertebrates

Kingdom

Phylum

Class

Order

Family

Genus

Species

General contains many organisms

specific contains a single organism

British mayflies

Order Ephemeroptera

9 Families

21 Genera

53 Species

SmartRivers

Take your riverfly surveys to the highest level!

Through SmartRivers, citizen scientists are helping to fill monitoring gaps.

Volunteers are trained to sample (adhering to regulator guidelines) and identify invertebrates relevant to their river to species-level where possible.

The results, in the form of species lists, are submitted to our free, open-access database.

What is produced?

1. Water quality stress scores

2. Invertebrate diversity and abundance records

95
Rivers to date

Powered by WildFish.

Training Day 1

- Learning to sample to professional standards
- Preserving & sorting

WildFish. SmartRivers

Training Day 2

- Become an expert of your river, learning to ID species from expected species list
- ‘Sample & Send’ option available to all hubs

From sample to score...

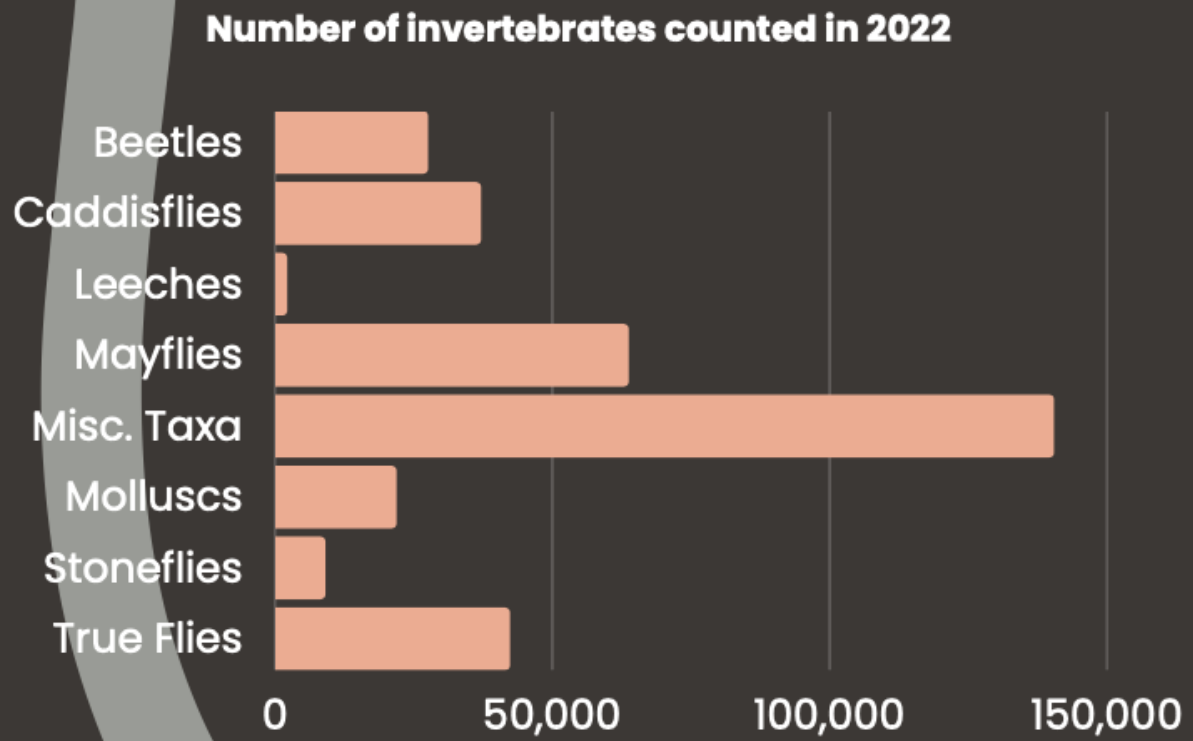
1. Collect invertebrate sample
2. Pick out species and quantities from sample
3. Look up species and abundances against tolerance tables
4. Calculate water quality stress score

Invertebrate image library

Images not to scale

The 2022 national SmartRivers breakdown

153	149	55
sites monitored in spring	sites monitored in autumn	rivers monitored



268

Different invertebrate species found

343,077

Total invertebrate specimens counted

SPRING

Greatest stress from sediment

AUTUMN

Greatest stress from chemicals

Nothing to hide

The SmartRivers interactive database is online and open to all

Request a login by emailing smartrivers@wildfish.org

From sample to score...

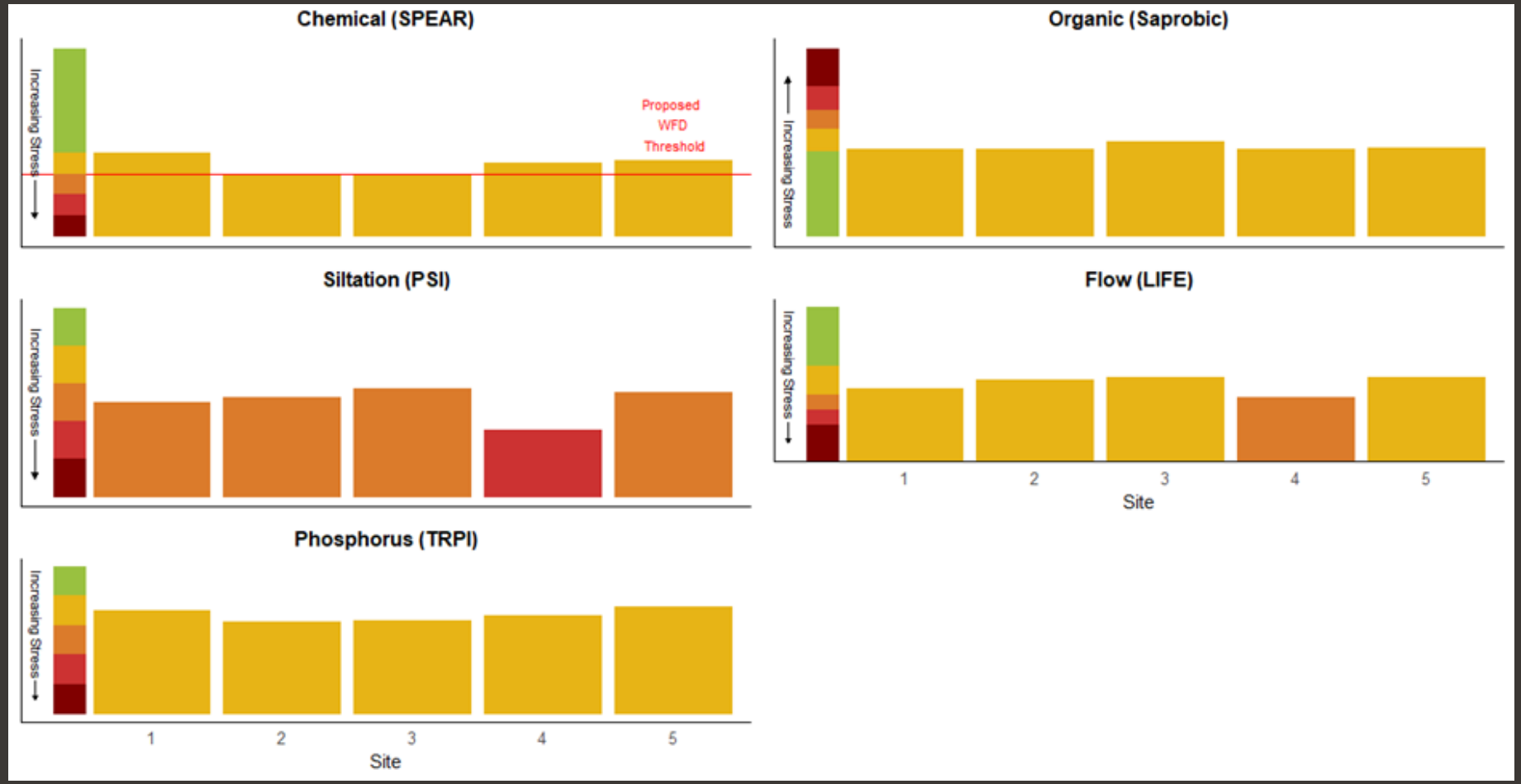
Collect invertebrate sample

Pick out species and quantities from sample

Look up species and abundances against tolerance tables

Calculate water quality stress score

Water quality stress scores



River Stour, Autumn 2023

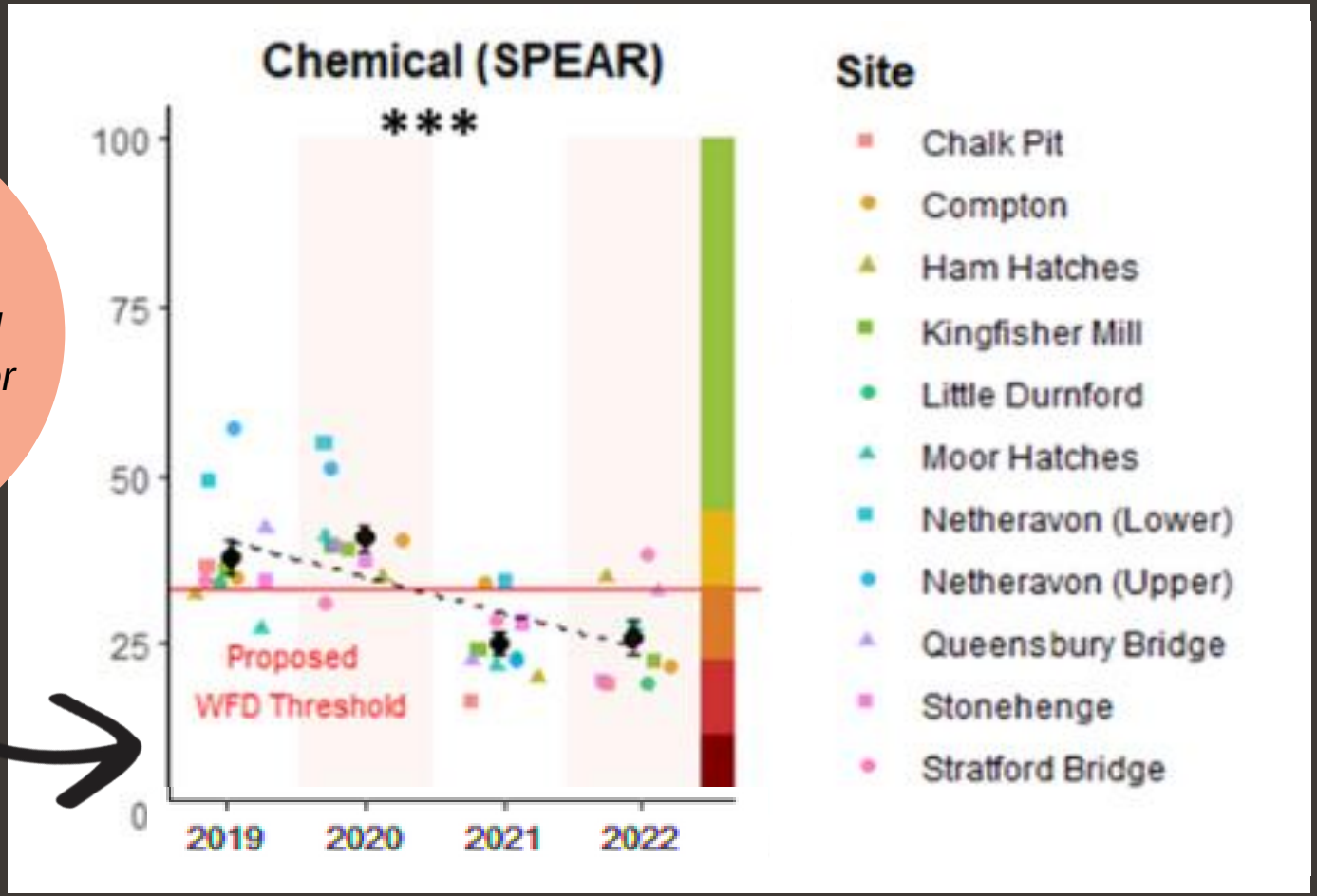
Water quality stress scores

From sample to score...

- Collect invertebrate sample
- Pick out species and quantities from sample
- Look up species and abundances against tolerance tables
- Calculate water quality stress score

Example:

Autumn chemical stress on the River Avon sites



From sample to score...

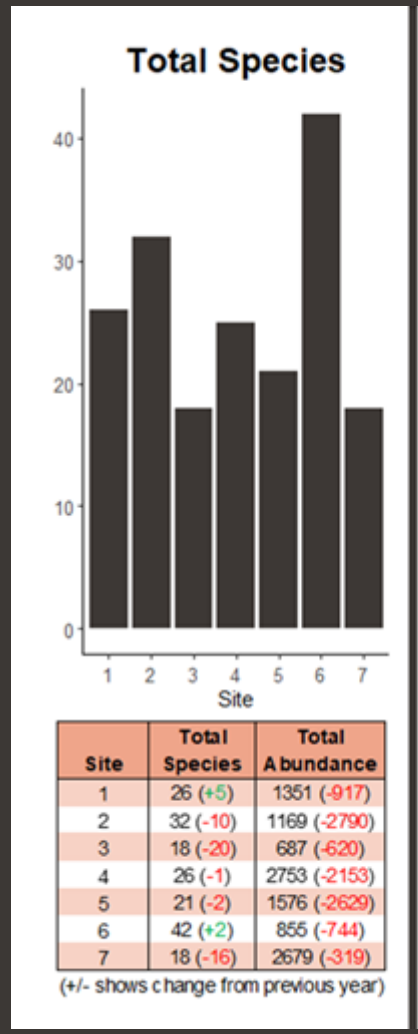
Collect invertebrate sample

Pick out species and quantities from sample

Look up species and abundances against tolerance tables

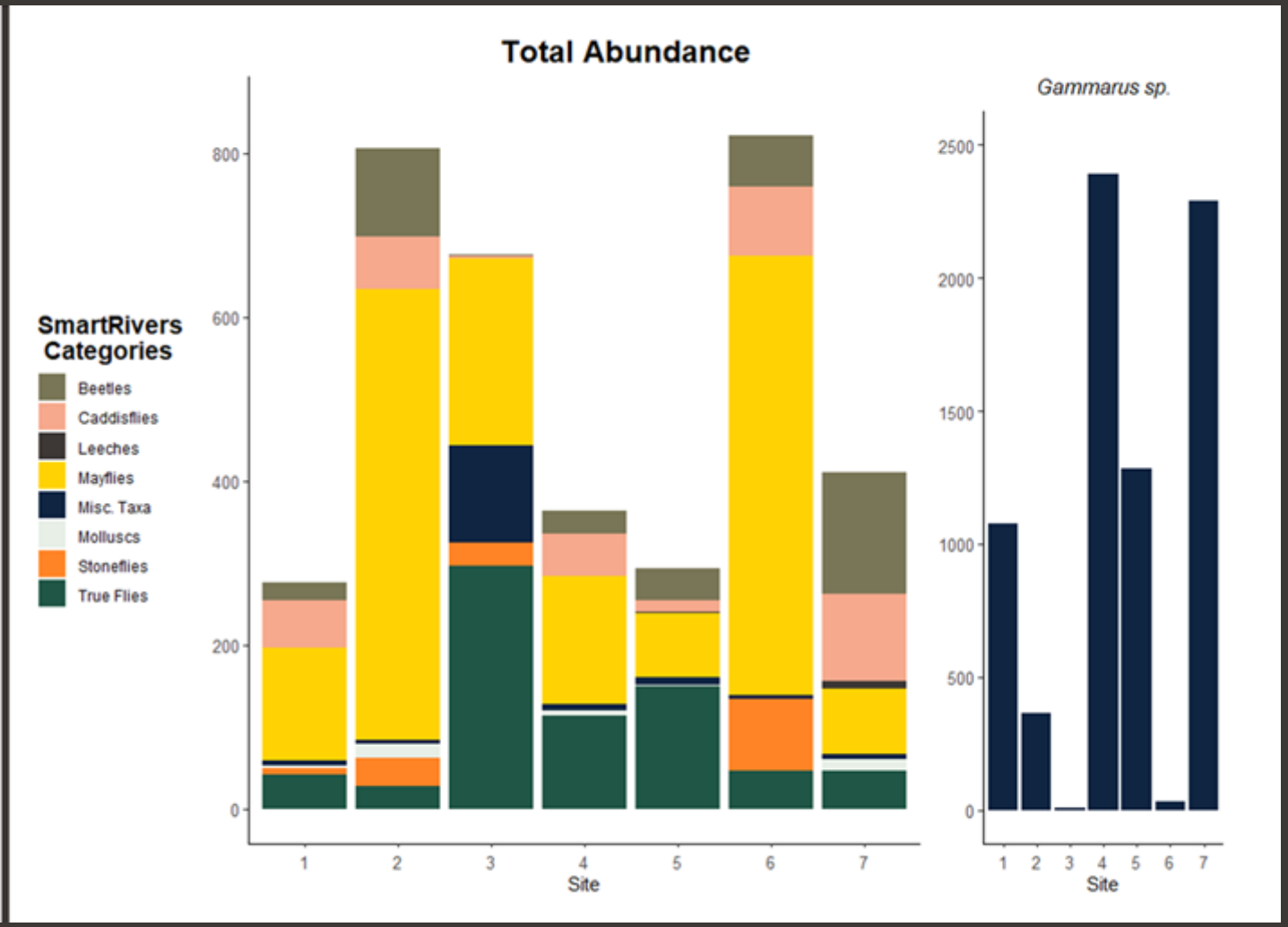
Calculate water quality stress score

Invertebrate biodiversity records



Site	Total Species	Total Abundance
1	26 (+5)	1351 (-917)
2	32 (-10)	1169 (-2790)
3	18 (-20)	687 (-620)
4	26 (-1)	2753 (-2153)
5	21 (-2)	1576 (-2629)
6	42 (+2)	855 (-744)
7	18 (-16)	2679 (-319)

(+/- shows change from previous year)

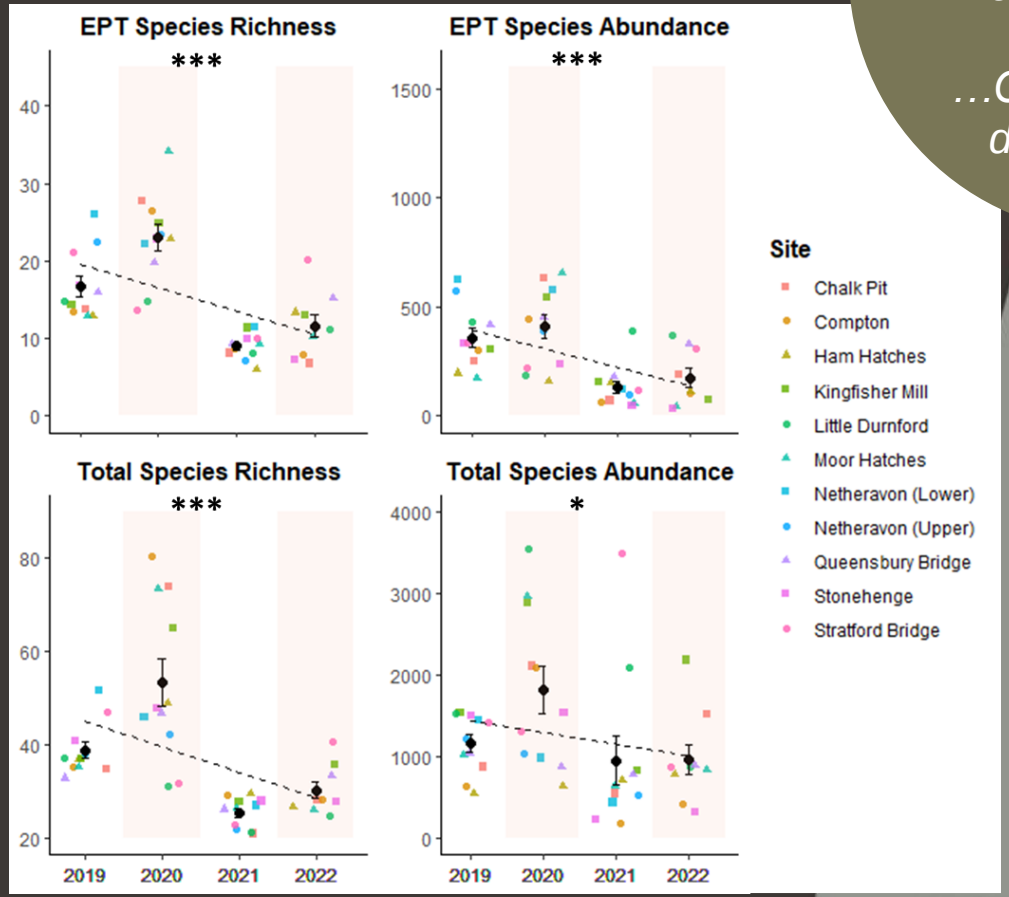


River Alyn, Spring 2023

‘The river Avon has not deteriorated over the last five years...’

Environment Agency

With the help of WildFish, SmartRivers evidence gives us the ability to challenge statements like this



Autumn EPT (riverfly) and total invertebrate diversity/abundances from 2019-2023

…Clearly there is deterioration!

Chalk streams like the Itchen and Avon have the highest form of environmental protection (designation as a Special Area of Conservation and Site of Special Scientific Interest).

If we can't look after our most protected of rivers, what hope is there for those that have no designation?

Photo: Charles Rangeley-Wilson

Ensuring the law is enforced **NOW**

Stopping the deterioration of our rivers

Legal Action on Sewage

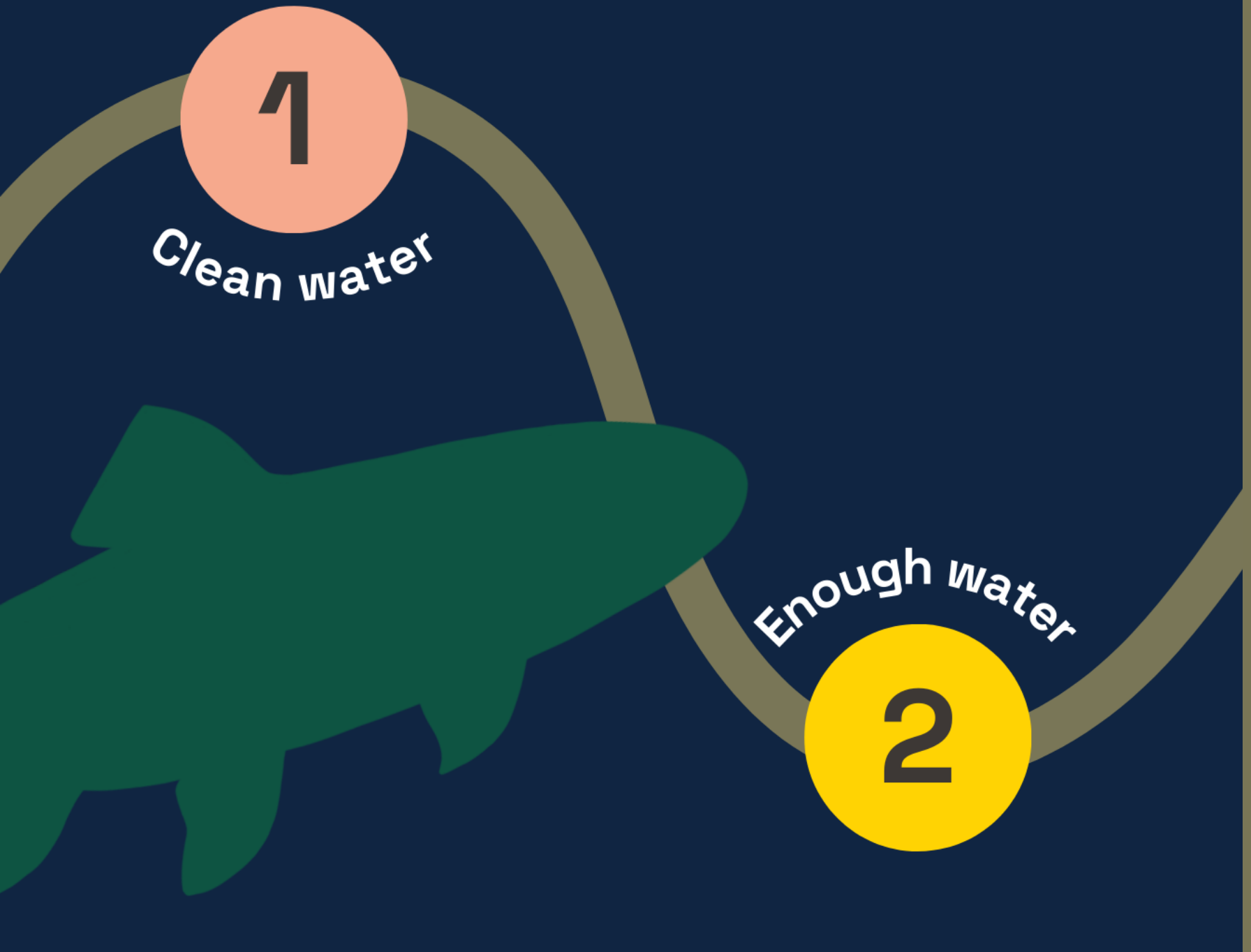
2022: Complaint – Office for Environmental Protection

OEP investigation has already identified possible failures to comply with environmental law by DEFRA, the Environment Agency and OFWAT.

“we believe that there may have been failures to comply with environmental law by all three of the public authorities”.

2023: Judicial Review – High Court

Case confirmed that sewage treatment infrastructure needed to comply with the 1994 law must be funded by the water companies and not by customers through their water bills.



Fundamentally, chalk streams will not improve without getting these things right

2 Enough water

Over abstraction is the process of taking more water out of a river system than can be replenished naturally.

- Fish are less able to migrate up and down rivers
- Pollutants in the water become more concentrated
- Sediment clogs up rivers because rivers do not have the energy to remove
- Reduced shelter and food availability for wild fish
- Water temperatures increase and oxygen levels decrease

Keeping water in rivers

Water companies must not depend solely on our rivers to meet water supply demands

Ask your MP:
Where is my water coming from?

Current situation

In their Statement of Response, published in August 2023, Southern Water presented plans to extend the use of drought permits on the Test until 2034/35 and Itchen until 2029/30.

Southern Water was entrusted to find alternative water supplies to reduce its reliance on the Test & Itchen…

Section 20

Under the section 20 agreement, they were obligated to use all best endeavours to have an **alternative water resource in place by 2027.**

Thank you!

Any questions?

Sam Green & Nick Measham

sam@wildfish.org
smartrivers@wildfish.org

WildFish.