# Meeting 20th June Wensum Ecology Working Group

## Agenda

- General Update
- Widen Ecology Group membership across all communities
- Update on Water Quality Monitoring
- Headwater Focus
- Riverfly monitoring scheme
- Wider biodiversity monitoring opportunities
- Survey river and identify areas for improvement
- Creation of shelf ready projects
- Research key issues
- Discussion

David Harper Our New WCP Chairman

David Harper is a retired (2015) Professor of Freshwater Biology at University of Leicester, now living in North Norfolk. He is author of one book on eutrophication of waters and of over 125 scientific publications.

He is an Honorary Fellow of the Freshwater Biological Association, which manages RiverFly and is the major UK organisation promoting the ecological health of rivers and lakes. He was one of the founders of the Welland Rivers Trust in 2010 and raised £0.5 million in 2012-5 from the government Catchment Restoration Fund to restore 1.5km of river through Market Harborough as a partnership between WRT and the university.

Recently 2021 he raised, jointly with the Warden of Sculthorpe Moor Nature Reserve, Nigel Middleton, £0.25 million from the Green Recovery Fund, to introduce beavers to an enclosure on the Reserve and, in partnership with Raynham Estates & the Norfolk Rivers Drainage Board, to re-flood drying reed bed and wet woodland on Hempton Moor (Fakenham).

What are we doing within the Wensum Catchment Partnership

Ecology – Morphology – Water Quality working groups set up

Initial scope based on EA sampling data 2016-2020
Focus scope on the Headwaters as raised Phosphate levels
Delayed do to the pandemic and lack of resources
WfT funded feasibility and scope of catchment wide Citizen Science
New funding from coca cola brought about volunteer scheme July-Dec 2022
Headwaters Ecology Survey led by David Harper in April

20 Volunteers confirmed and equipped for the Headwaters building on procedures developed through Steve Lane looking at National Best Practice

Emerging proposals coming though both AT and NRT, with the NRT supported by £7.2m funds from OFFWAT.

But our focus for 2022 are the headwaters.

# Water for Tomorrow: Wensum Citizen Science Feasibility Assessment

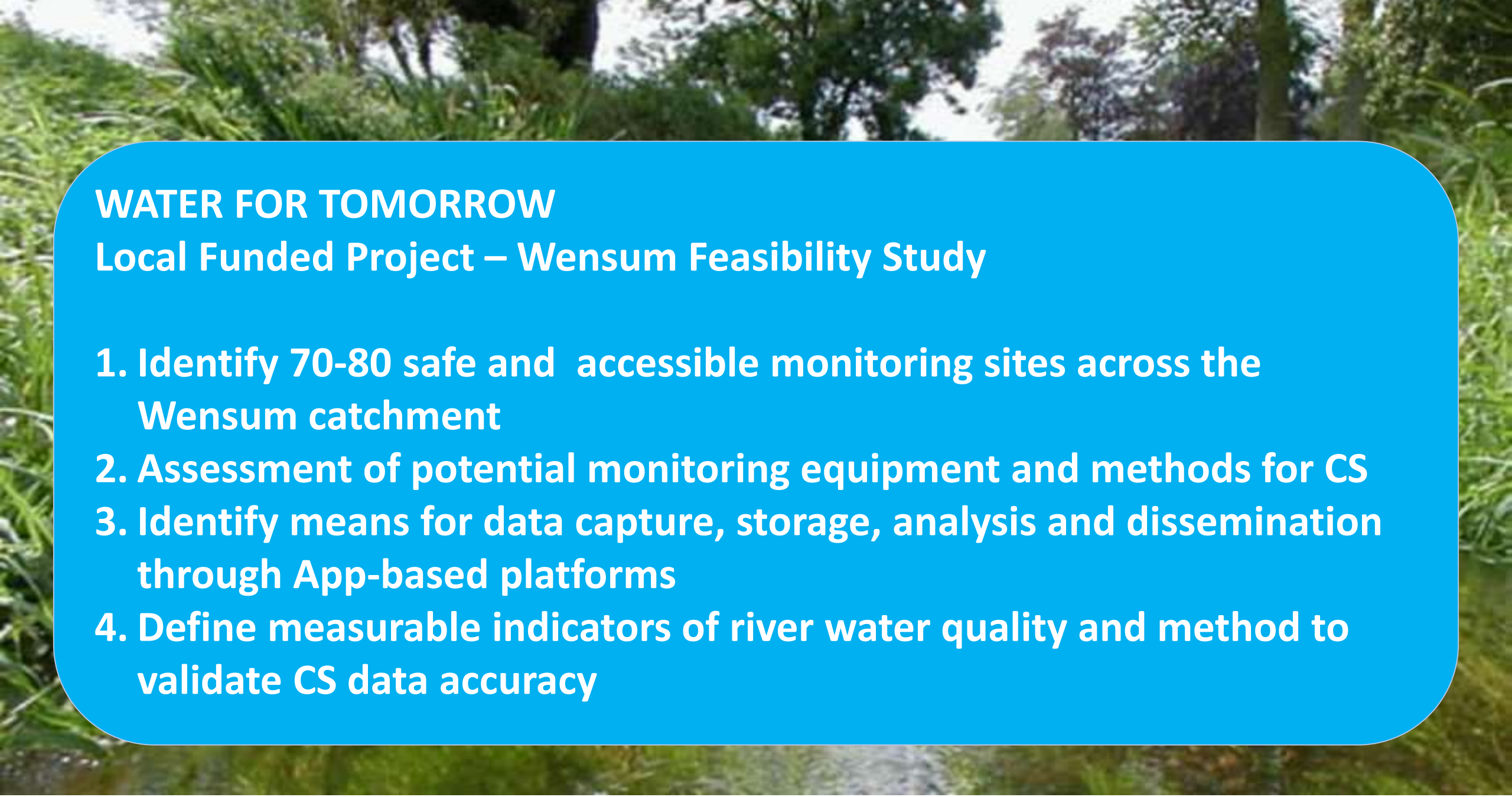
Catchment Based Approach

Interreg France (Channel Manche) England Water For Tomorrow

The Rivers Trust

Environment Agency

Steve Lane Environmental Consultancy Services



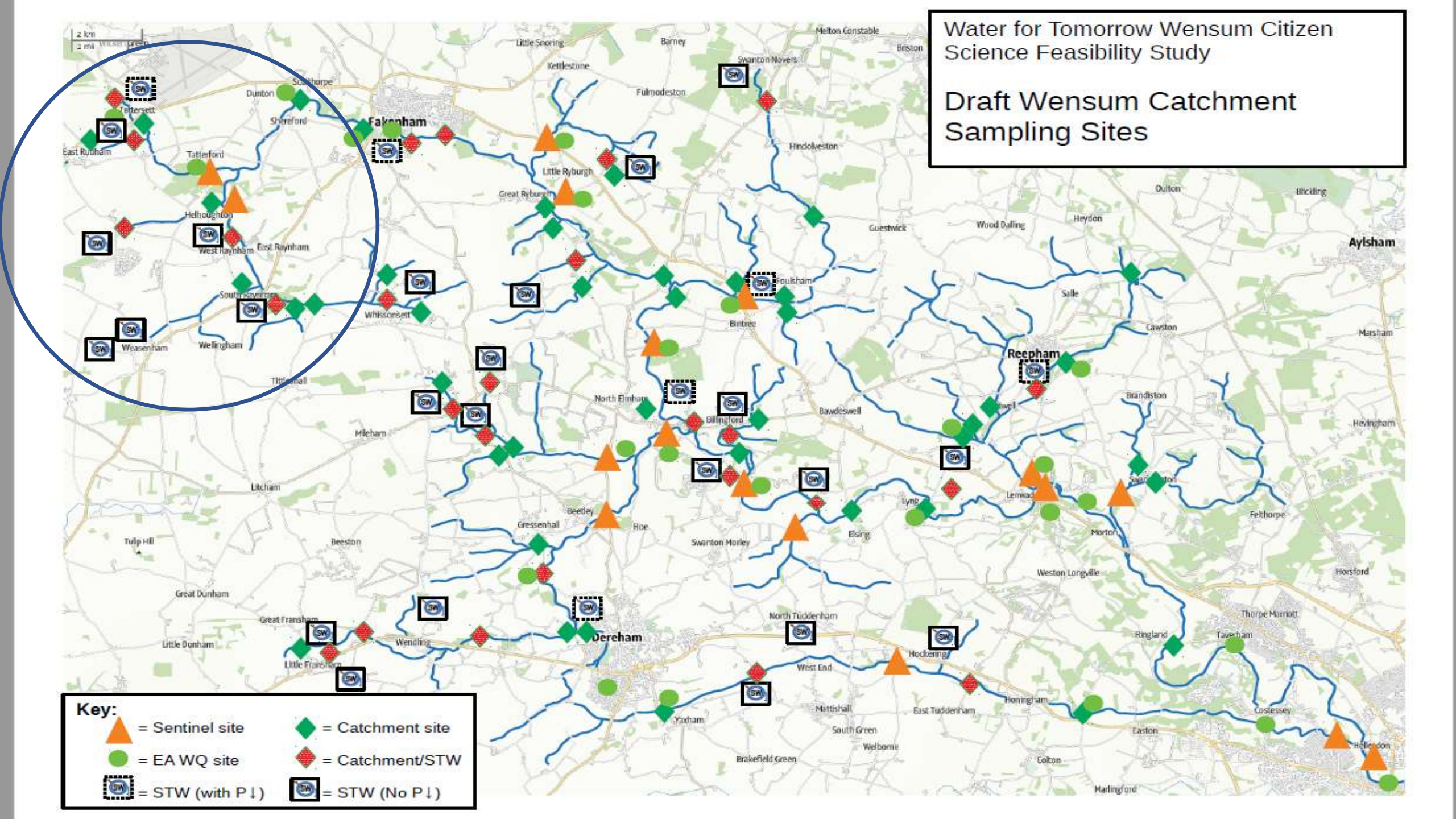
## WATER FOR TOMORROW

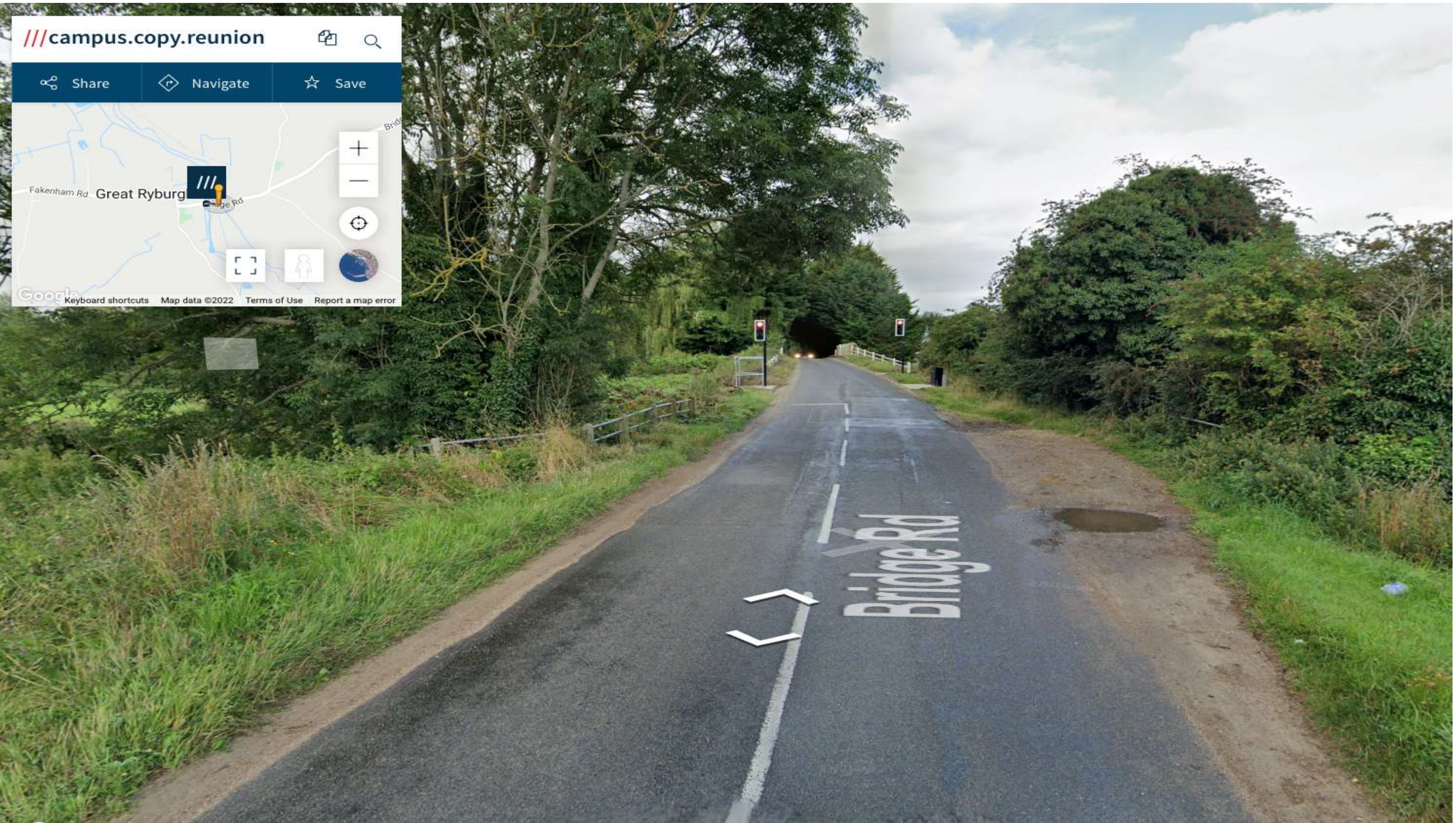
## Local Funded Project – Wensum Feasibility Study

1. Identify 70-80 safe and accessible monitoring sites across the Wensum catchment
2. Assessment of potential monitoring equipment and methods for CS
3. Identify means for data capture, storage, analysis and dissemination through App-based platforms
4. Define measurable indicators of river water quality and method to validate CS data accuracy

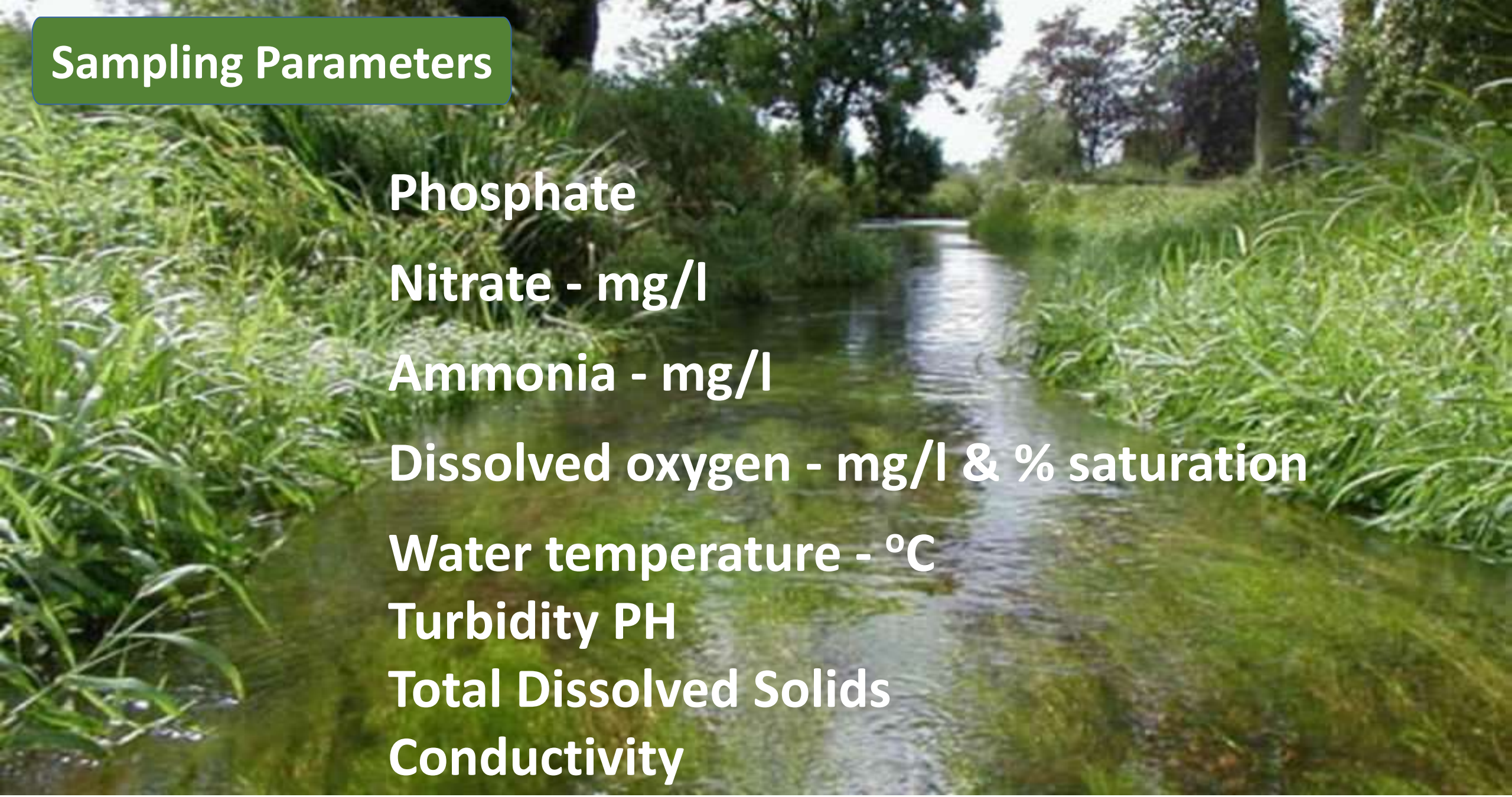
Water for Tomorrow Wensum Citizen Science Feasibility Study

# Draft Wensum Catchment Sampling Sites




///campus.copy.reunion
Share
Navigate
Save
Fakenham Rd
Great Ryburg
Keyboard shortcuts
Map data ©2022
Terms of Use
Report a map error
Bridge Rd

# Sampling Parameters



Phosphate

Nitrate - mg/l

Ammonia - mg/l

Dissolved oxygen - mg/l & % saturation

Water temperature - °C

Turbidity PH

Total Dissolved Solids

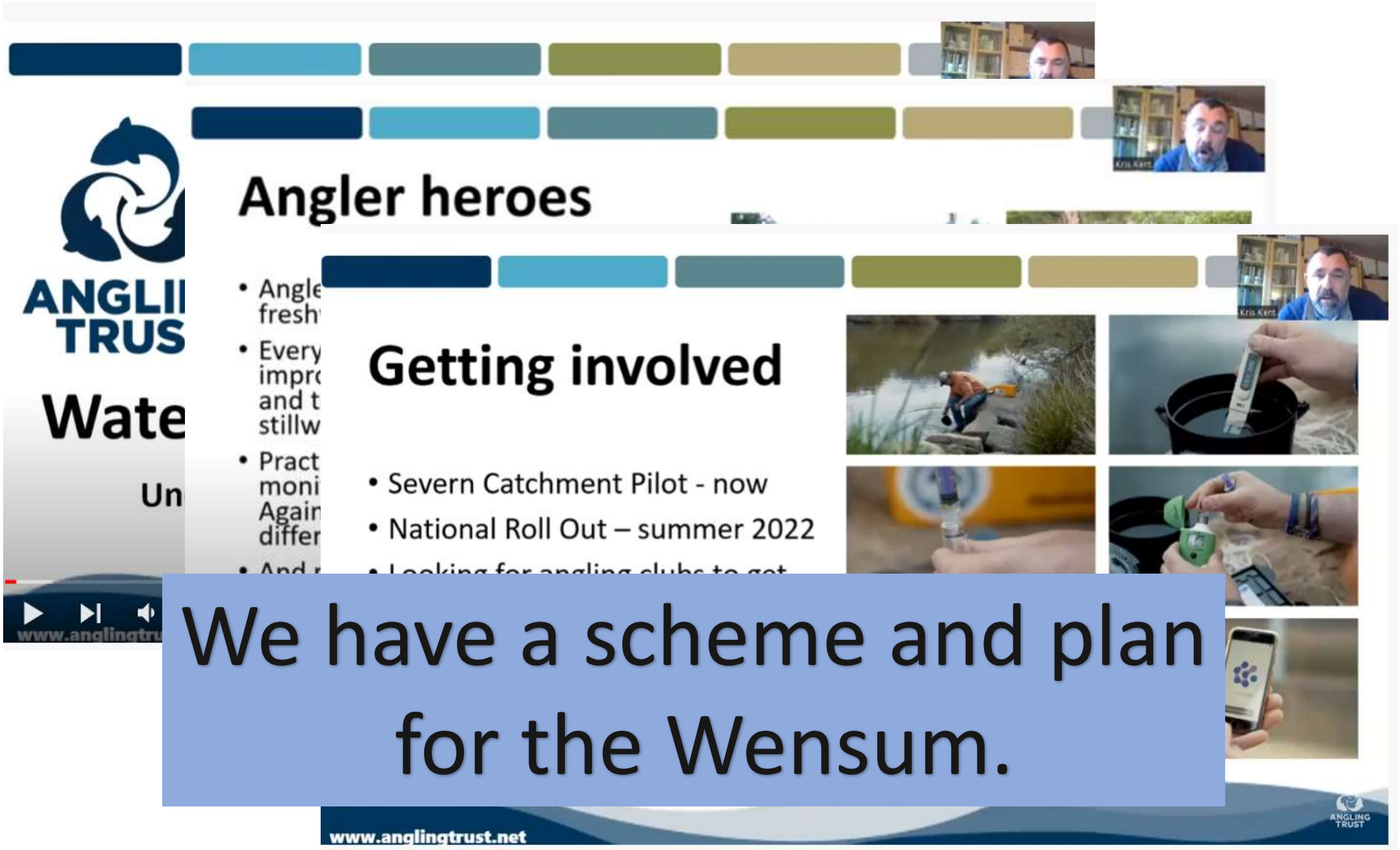
Conductivity

# Suggested Equipment

| Parameter: | Kit |
|---|---|
| Orthophosphate (PO4 -3) & Orthophosphate as P (PO4-P) | Hanna Low Range Phosphate Checker HI-713 |
| Ammonia-N (NH3-N) | Hanna Low Range Ammonia Checker HI-700 |
| Nitrate (NO3) | Hach nitrate nitrite strips<br>No low cost 'Checker' for freshwater testing |
| Dissolved Oxygen (mg/l and % saturation) + water temperature (°C) | AZ Instruments 8403 Dissolved Oxygen Meter |
| Turbidity | Graduated Turbidity Secchi tube |
| pH | pH Pen Tester |
| TDS & conductivity | TDS & EC Pen Tester |
| | : |

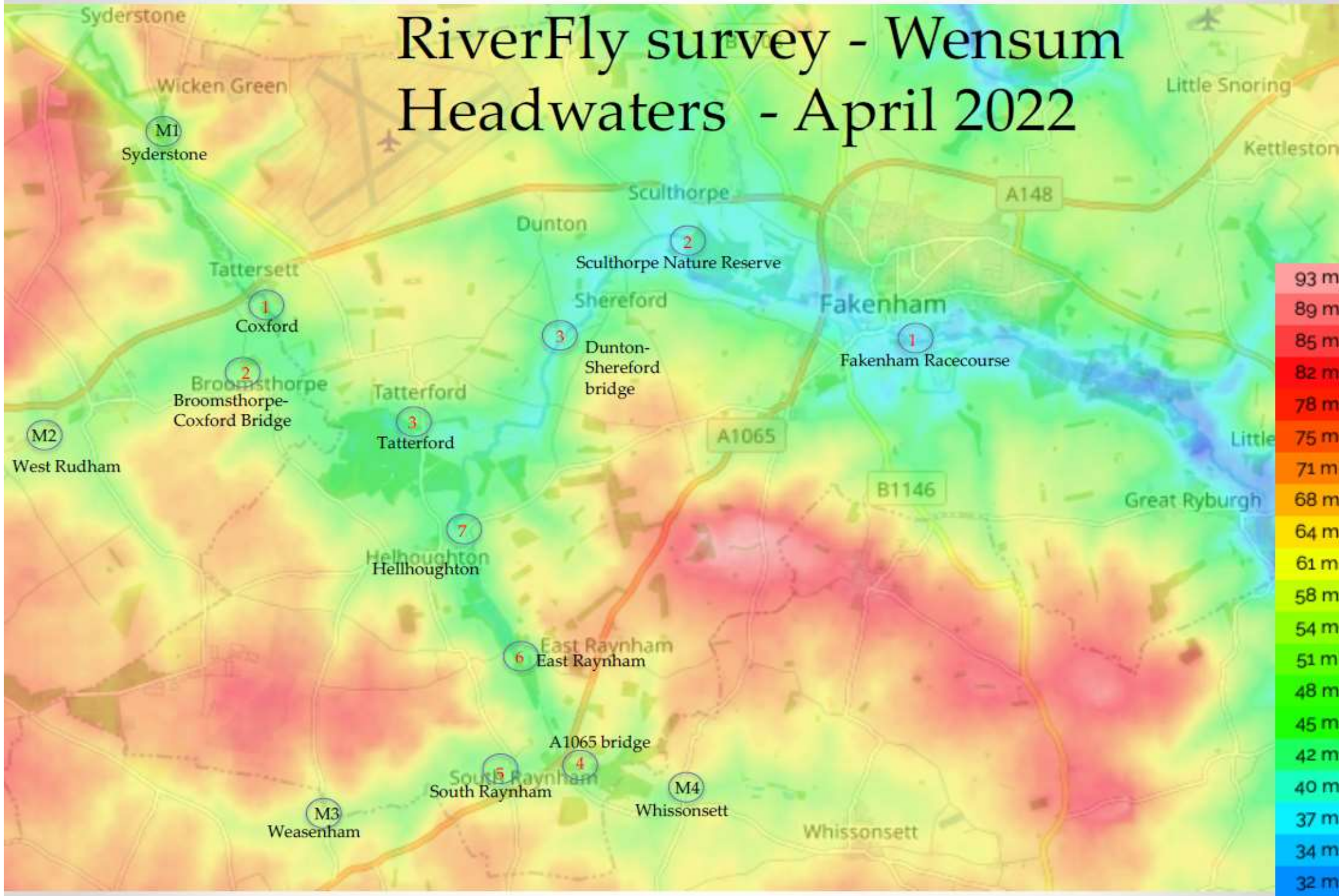
User: **Steve Lane**
Response Id: **Steve Lane-A5SCJJ**
Submitted: **Feb 16, 2022 11:45 AM**
IP Address: **82.132.226.124**
Status: **Final**
Drafted by Steve Lane on Feb 16, 2022 11:39 AM
Submitted by Steve Lane on Feb 16, 2022 11:45 AM

| Question | Answer |
|---|---|
| Please confirm today's date: | February 16, 2022 |
| Which of our River Wensum sampling sites are you monitoring? | WensR4-24a Norfolk Flyfishers Riffle<br>Wed, Feb 16, 2022 11:40 AM<br>52.73410419508738° 0.9803050964794624°(+/-) 8.001 m |
| Has there been any rain in the area over the last 24 hours? | Yes |
| If it has rained in the last 24 hours, has this been light, moderate or heavy rainfall? | Moderate |
| Looking at the river, is it still, slow, moderate, fast flowing or dry? | Moderate flow |
| Is the river water clear or is it coloured (turbid)? | Coloured/turbid |
| If you can see the river bed, what is the most common thing it is made of? | Too coloured to see bed |
| What is the river water temperature (in degrees C)? | 9.1 |
| What is your Dissolved Oxygen reading (in % saturation)? | 85 |
| What is your dissolved oxygen reading in mg/l? | 9.74 |
| What is your Phosphate reading (in mg/l)? | 0.22 |
| What is your nitrate reading (in mg/l)? | 2 |
| What is your ammonia reading in mg/l? | 0.02 |
| What is your pH reading? | 7.85 |
| What is your TDS reading in mg/l? | 248 |
| What is your conductivity (EC) reading in uS? | 504 |
| Have you seen anything odd, unusual or important while visiting this site? If so please let us know here: | Site at Burghfield common DS fishing platform baking. Highs. Drawn |
| Please upload a picture of the river channel as you see it looking upstream |  <br>52.73396930769216° 0.98020009807869°(+/-) 8.001 m |
| Upload short video (<5 seconds) | |

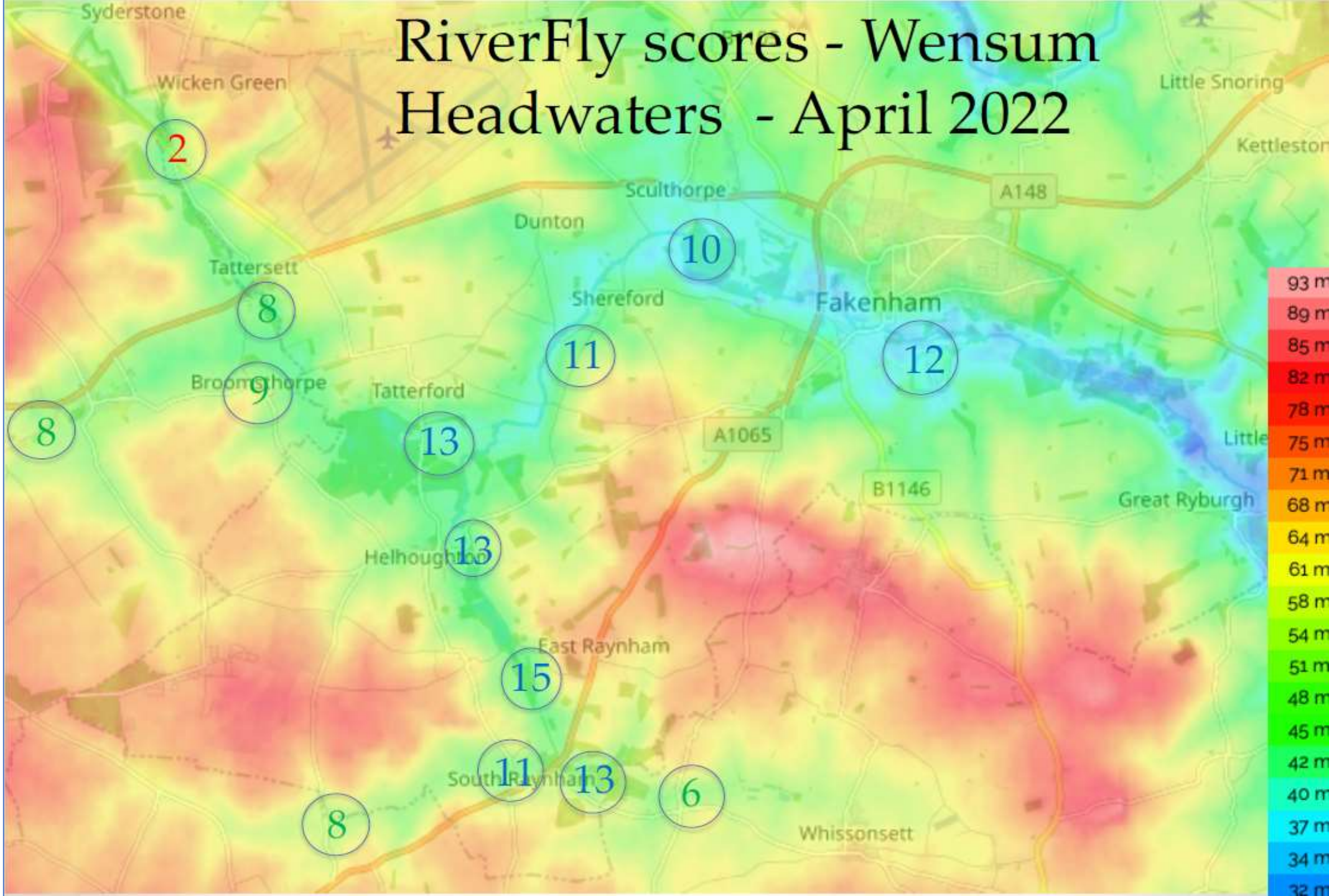



We have a scheme and plan for the Wensum.

David Harper



David Harper



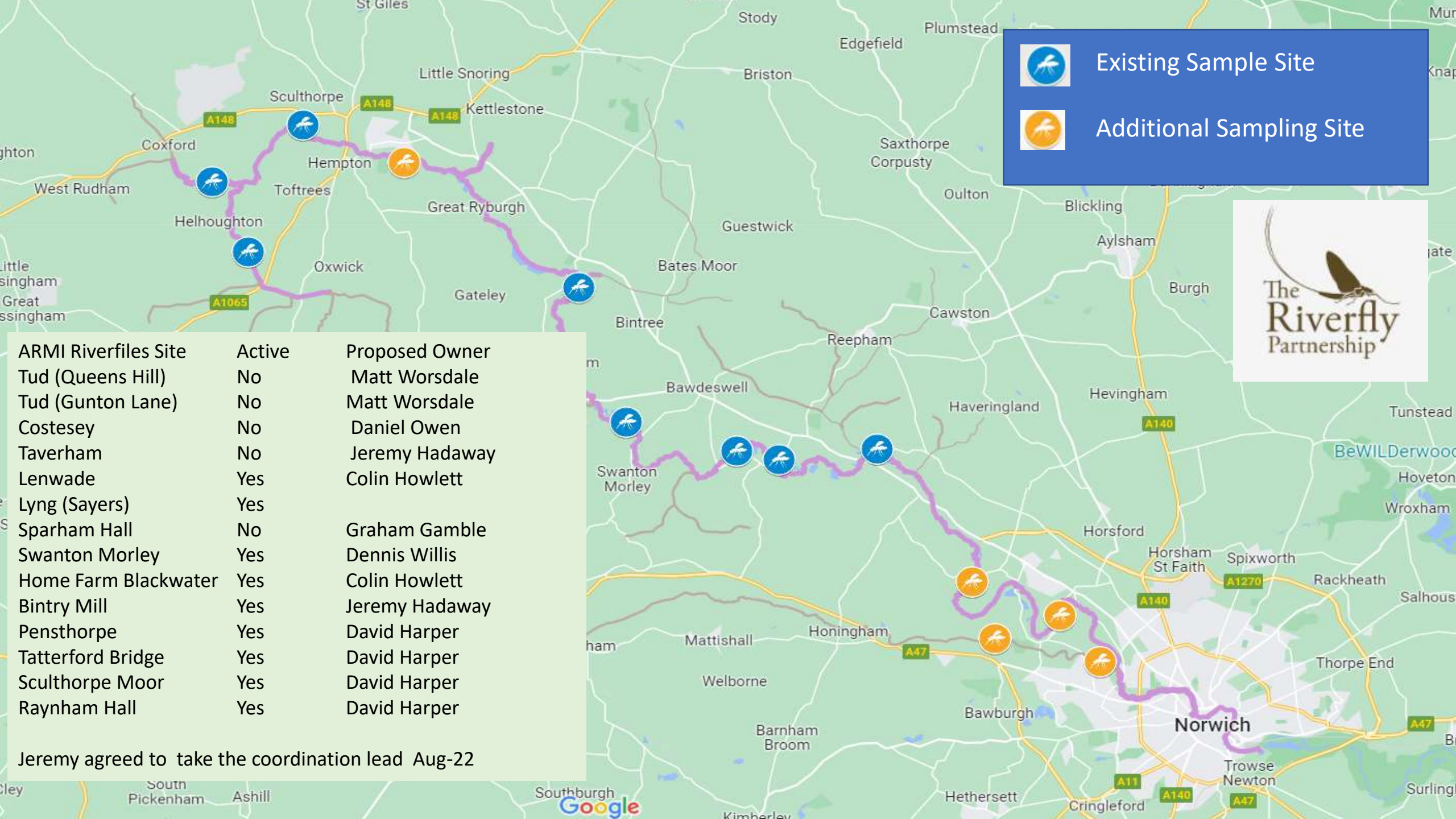
Wensum Headwaters Survey, April 2022

In conclusion,
The Wensum Headwaters are in an extremely poor state, with limited improvement as downstream flow volume increases. This is largely due to poor physical state, a result of the ubiquitous engineering drainage works in the latter half of the 20th Century, and excessive silt deposits.

The Tat is also contaminated by phosphate and the Wensum by some unknown chemical that has wiped out all molluscs.

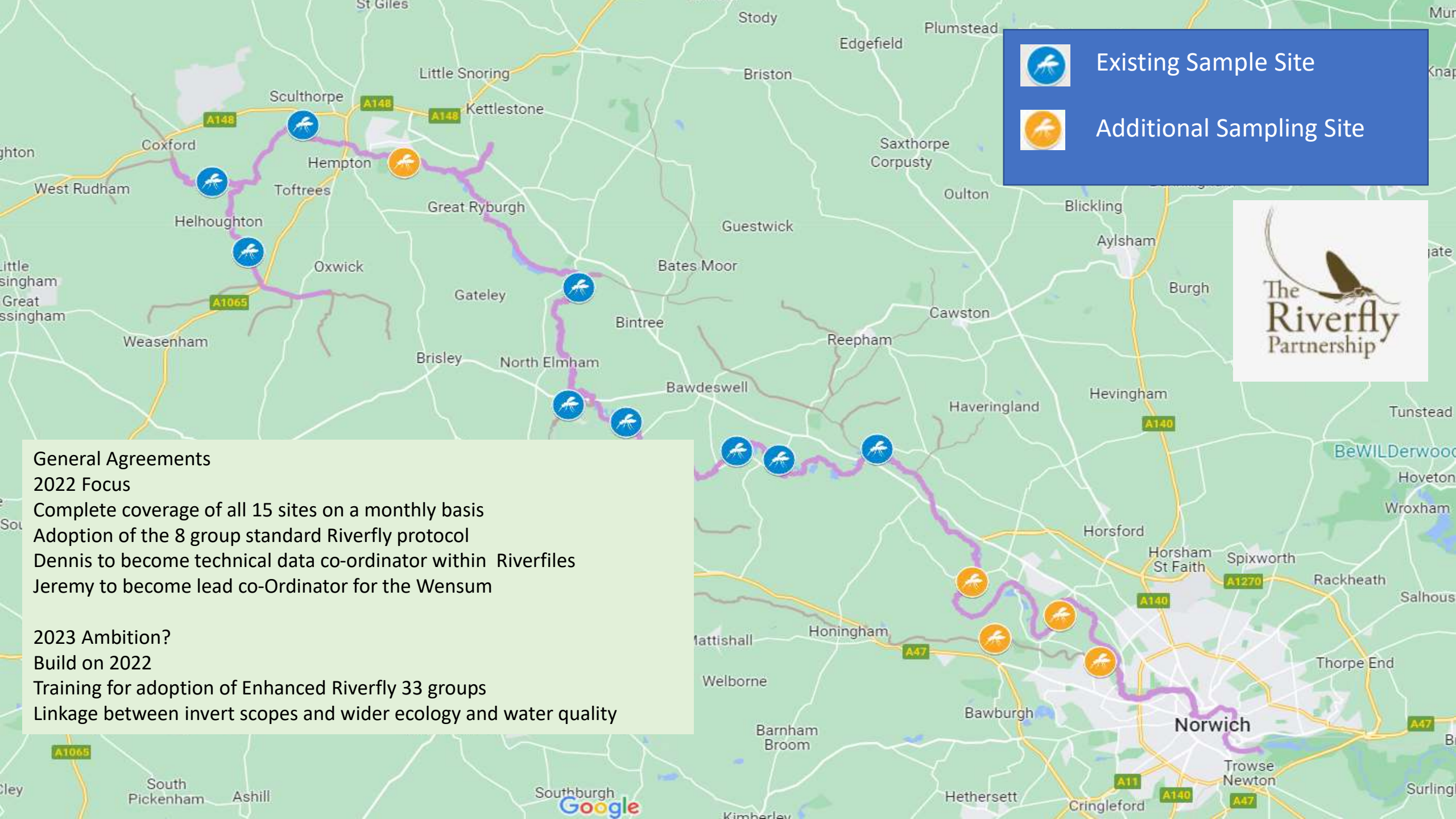
The Wensum cannot be an ‘iconic chalk-stream’ whilst its headwaters are so minimal in ecological health; restoration efforts should be from the top down rather than piecemeal at places along the river.

David Harper April 2022




| ARMI Riverfiles Site | Active | Proposed Owner |
|---|---|---|
| Tud (Queens Hill) | No | Matt Worsdale |
| Tud (Gunton Lane) | No | Matt Worsdale |
| Costesey | No | Daniel Owen |
| Taverham | No | Jeremy Hadaway |
| Lenwade | Yes | Colin Howlett |
| Lyng (Sayers) | Yes | |
| Sparham Hall | No | Graham Gamble |
| Swanton Morley | Yes | Dennis Willis |
| Home Farm Blackwater | Yes | Colin Howlett |
| Bintry Mill | Yes | Jeremy Hadaway |
| Pensthorpe | Yes | David Harper |
| Tatterford Bridge | Yes | David Harper |
| Sculthorpe Moor | Yes | David Harper |
| Raynham Hall | Yes | David Harper |

Jeremy agreed to take the coordination lead Aug-22




General Agreements
2022 Focus
Complete coverage of all 15 sites on a monthly basis
Adoption of the 8 group standard Riverfly protocol
Dennis to become technical data co-ordinator within Riverfiles
Jeremy to become lead co-Ordinator for the Wensum

2023 Ambition?
Build on 2022
Training for adoption of Enhanced Riverfly 33 groups
Linkage between invert scopes and wider ecology and water quality

Meeting 20th June Wensum Ecology Working Group
Biodiversity monitoring opportunities

How should be bring together the overall health status of the River
Lots of studies and data, but not joined up.
We have more reports from the past two decades without any real outcomes
How can we bring this together?

# Meeting 20th June Wensum Ecology Working Group

# Potential overview of ecological and biodiversity status

| Compartment | SSSI Unit Number | Reach Number | Section | Length | River Restoration | Fishing Rights | Target Fishery | Invasive Species | Fish Roach Density | Fish Dace Density | Fish Chub Density | Fish Pike Density | Fish Trout Density | Fish Desg Density | Inverts Score | Chem P | Chem A | Chem N | Chem Solids | Flow | Fish Habitats | Fish Passage | Geomorphology | Macrophytes | NNIS | SAC | SAC | SAC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Measure Definition | | | | | ? | 100m2 | 100m2 | 100m2 | 100m2 | 100m2 | 100m3 | Riverfly Score | mg/l | mg/l | mg/l | mg/l | % HOF | m2 | Pass | ? | ? | ? | Desg 1 | Desg 2 | Desg 3 |
| 1 | N/A | N/A | Yare - New Mills | 4.39 | | | | | | | | | | | | | | | | | | Eel | | | | | | |
| 2 | N/A | N/A | New Mills - Hellesdon Mill | 4.23 | | 4.23 | Coarse | | 3.22 | 0.48 | 0.39 | 0.38 | 0.01 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | Eel | | | | | | |
| 3 | 54 | RWRS 01 | Hellesdon Mill - Mount Farm | 1.65 | | | Coarse | | 3.22 | 0.48 | 0.39 | 0.38 | 0.01 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | Full | | | | | | |
| 3 | 54 | RWRS 02 | Mount Farm - Costessey Mill | 3.16 | 0.72 | 1.4 | Coarse | | 3.22 | 0.48 | 0.39 | 0.38 | 0.01 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | Eel | | | | | | |
| 4 | 54 | RWRS 03 | Costessey Mill - Taverham Mill | 3.91 | 1.5 | 1.03 | Coarse | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | Eel | | | | | | |
| 5 | 53 | RWRS 04 | Taverham Mill - Northfields | 1.49 | | 0.8 | | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | | | | | | | |
| 5 | 53 | RWRS 05 | Northfields - Downstream Ringland | 2.56 | | | | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | | | | | | | |
| 5 | 53 | RWRS 06 | Downstream Ringland -Ringland Road | 0.23 | 0.23 | | | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | | | | | | | |
| 5 | 53 | RWRS 07 | Ringland Road - Attlebridge Hall | 3.62 | | | | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | | | | | | | |
| 6 | 53 | RWRS 08 | Attlebridge Hall - Morton Bridge | 1.25 | 1.5 | | | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | | | | | | | |
| 6 | 53 | RWRS 09 | Morton Bridge - Slade Plantation | 1.11 | | | | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | | | | | | | |
| 6 | 53 | RWRS 10 | Slade Plantation - Lenwade Mill | 2.94 | | 2.358 | | | 1.11 | 1.15 | 1.43 | 0.54 | 0.00 | | | 0.06 | 0.04 | 5.92 | 5.73 | 47 | | | | | | | | |
| 7 | 52 | RWRS 11 | Lenwade Mill - Walsis Hill | 2.43 | | 1.458 | Coarse | | 0.04 | 0.55 | 1.18 | 0.38 | 0.02 | | | 0.06 | 0.04 | 6.14 | 5.65 | 47 | | | | | | | | |
| 7 | 52 | RWRS 12 | Walsis Hill - Lyng Mill | 2.15 | 2.15 | 2.15 | Coarse | | 0.04 | 0.55 | 1.18 | 0.38 | 0.02 | | 12 | 0.06 | 0.04 | 6.14 | 5.65 | 47 | | | | | | | | |
| 8 | 52 | RWRS 13 | Lyng Mill - Elsing Mil | 3.74 | | 4.13 | Coarse | | 0.04 | 0.55 | 1.18 | 0.38 | 0.02 | | 13 | 0.06 | 0.04 | 6.67 | 5.17 | 47 | | | | | | | | |
| 9 | 51 | RWRS 14 | Elsing Mill - Swanton Morley Mill | 4.71 | 0.88 | 2.08 | Coarse | | 0.04 | 0.55 | 1.18 | 0.38 | 0.02 | | 7 | 0.06 | 0.04 | 6.67 | 5.17 | 47 | | | | | | | | |
| 10 | 51 | RWRS 15 | Swanton Morley Mill - Riverside Farm | 2.52 | | 2.212 | Coarse | | 2.96 | 0.50 | 1.18 | 0.38 | 0.02 | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 10 | 51 | RWRS 16 | Riverside Farm - North Elmham Mill | 1.17 | | 0.867 | Coarse | | 0.27 | 0.53 | 0.63 | 1.3 | 0.05 | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 11 | 50 | RWRS 17 | North Elmham Mill - Bintree Woods | 2.6 | | | | | 0.27 | 0.53 | 0.63 | 1.4 | 0.05 | | 17 | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 11 | 50 | RWRS 18 | Bintree Woods - Dell View Farm | 0.86 | | | | | 0.27 | 0.53 | 0.63 | 1.3 | 0.05 | | 17 | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 12 | 50 | RWRS 19 | Dell View Farm - Bintry Mill | 2.67 | 2.67 | 0.405 | Coarse | | 0.27 | 0.44 | 0.09 | 0.88 | 0.07 | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 13 | 49 | RWRS 20 | Bintry Mill - Guist Common | 2.01 | | 0.93 | Game | | 0.27 | 0.44 | 0.09 | 0.88 | 0.07 | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 13 | 49 | RWRS 21 | Guist Common - Great Ryburgh Mill | 3.31 | 1.32 | | | | 0.27 | 0.25 | 0.09 | 0.44 | 0.75 | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 14 | 48 | RWRS 22 | Great Ryburgh Mill - Pensthorpe Wildfowl Park | 2.38 | | 0.362 | Mixed | | 0.27 | 0.25 | 0.09 | 0.44 | 0.75 | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 14 | 48 | RWRS 23 | Pensthorpe Wildfowl Park - Great Ryburgh Commor | 1.98 | 1.98 | | Mixed | | 0.27 | 0.25 | 0.09 | 0.44 | 0.75 | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 14 | 48 | RWRS 24 | Great Ryburgh Common | 0.18 | 0.175 | | Mixed | | | | | | | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 14 | 48 | RWRS 25 | Great Ryburgh Common - Fakenham Mill | 1.96 | | 1.914 | Mixed | | | | | | | | | 0.05 | 0.03 | 9.09 | 6.00 | 99 | | | | | | | | |
| 15 | 47 | RWRS 26 | Fakenham Mill - Hempton | 0.46 | | 0.46 | | | | | | | | | 12 | 0.05 | 0.03 | 9.09 | 6.00 | 74 | | | | | | | | |
| 15 | 47 | RWRS 27 | Hempton - Sculthorpe Moor | 1.72 | 1.72 | 1.72 | Mixed | | | | | | | | 11 | 0.05 | 0.03 | 9.09 | 6.00 | 74 | | | | | | | | |
| 15 | 47 | RWRS 28 | Sculthorpe Moor - Sculthorpe Mill | 1.25 | 0.405 | | Mixed | | | | | | | | 11 | 0.05 | 0.03 | 9.44 | 4.8 | 74 | | | | | | | | |
| 16 | 47 | RWRS 29 | Sculthorpe Mill - South Mill Farm | 2.63 | 0.85 | | Mixed | | | | | | | | 11 | 0.05 | 0.04 | 7.8 | 4.84 | 74 | | | | | | | | |
| 17 | 47 | RWRS 30 | South Mill Farm - River Tat confluence | 0.67 | 0.65 | | | | | | | | | | 13 | 0.05 | 0.04 | 7.8 | 4.84 | 74 | | | | | | | | |
| 17 | 46 | RWRS 31 | Tat confluence | 0.48 | | | | | | | | | | | 13 | 0.05 | 0.04 | 7.8 | 4.84 | 74 | | | | | | | | |
| 17 | 46 | RWRS 32 | Tatterford Common | 0.32 | | | | | | | | | | | 9 | 0.05 | 0.04 | 7.8 | 4.84 | 74 | | | | | | | | |
| 17 | 46 | RWRS 33 | Tatterford Common - Helhoughton Common | 0.72 | | | | | | | | | | | 15 | 0.05 | 0.04 | 10.84 | 5.29 | 74 | | | | | | | | |
| 17 | 45 | RWRS 34 | Helhoughton Common - Brickkiln Plantation | 1.57 | 1.57 | | | | | | | | | | 13 | 0.05 | 0.04 | 10.84 | 5.29 | 74 | | | | | | | | |
| 18 | 45 | RWRS 35 | Brickkiln Plantation - West Raynham | 0.71 | 0.71 | | | | | | | | | | 8 | 0.05 | 0.03 | 10.84 | 5.29 | 74 | | | | | | | | |
| 18 | 45 | RWRS 36 | West Raynham - South Raynham Bridge | 1.41 | 1.41 | | | | | | | | | | 9 | 0.05 | 0.03 | 10.84 | 5.29 | 74 | | | | | | | | |
| 18 | 45 | RWRS 37 | South Raynham Bridge - Normans Burrow Wood | 0.72 | 0.72 | | | | | | | | | | 9 | 0.05 | 0.03 | 10.84 | 5.29 | 74 | | | | | | | | |
| 18 | 45 | RWRS 38 | Normans Burrow Wood - Pear Tree Corner | 0.85 | 0.85 | | | | | | | | | | 6 | 0.05 | 0.03 | 10.84 | 5.29 | 74 | | | | | | | | |
| 19 | | RWRS Tat | River Tat | 6.53 | 2.19 | | | | | | | | | | 2 | 0.09 | 0.04 | 7.8 | 4.84 | 74 | | | | | | | | |
| 20 | | RWRS Lang | Langor Drain | 1.98 | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | | RWRS | Guist Drain | 0.74 | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | RWRS | Wendling Beck - Dillington - Worthing | 6.90 | | | | | | | | | | | | 0.03 | 0.04 | | | | | | | | | | | |
| 22 | | RWRS | Wendling Beck - Grt Farnsham - Dillington | 10.00 | | | | | | | | | | | | 0.11 | 0.11 | | | | | | | | | | | |

What's this telling us?

River Tat key issue

Wendling Beck key issue

River Compartment | Lengths | Fisheries | Fish Density | Riverfly | Pollutants | Flow | Habitat | Geomorph | Designations

# Meeting 20th June Wensum Ecology Working Group

## Survey river and identify areas for improvement and shelf ready projects

| | | |
|---|---|---|
| Fakenham Hempall Road | | TF917529 / beside.picturing.octopus |
| Bintree Mill | | TF996241 / dates.impeached.hairpin |
| Yarrow House | | TF990232 / |
| Mill House Farm | | TG004203 / |
| Blackwater Worthi | | TG002199 / |
| Billingford Burgh C | | TG014193 / |
| Swanton Morely F | 2 | TG020184 / |
| Sw Morely White | n | TG021805 / |
| Mill Street Divert C | | TG050178 / |
| Lyng Mill and King | plete | TG070178 / |
| Lyng Rectory Road | | TG072175 / |
| Lyng Sparham Poo | | TG075175 / |
| Lenwade Mill Lane | | TG101182 / |
| Lenwade A1067 Bridge | | TG103182 / |
| Attlebridge Church Farm | 1000m 2021 | TG129167 / |
| Wensum Drain at Penny Spot Beck | 1000m 2022 | TG041617 / |

Survey Images from Keelers Meadow Lyng – No action proposed

# Meeting 20th June Wensum Ecology Working Group

## Research Projects 2022

| | |
|---|---|
| NE Macrophyte Surveys | Previously postponed |
| EA Statutory Monitoring | Weekly at 6 locations |
| EA Fish Surveys | Confirmed to take place in 2022 |
| Riverfly Sampling | Partially complete awaiting on Co-ordinator Aug-22 |
| Headwater Water Quality | Planned to start Jul-Dec 2022 weekly monitoring |
| | |
| Nott Uni | PhD in progress looking at whole riverine ecology and 91 element |
| UCL | Wensum Study using latest techniques for up to 1000 compounds July-22 |
| UEA | Supporting UWFGC on water quality sampling and validation |
| Earlham Institute | Linkages into Barcoding the Broads Scheme using DNA and gut samples from the Wensum |

# Meeting 20th June Wensum Ecology Working Group

## Discussion

Given the poor attendance of only Dennis Willis and Colin Howlett at the meeting, no formal minutes will be produced. But the presentation is available.

The general discussion was around the direction of travel of the Wensum Partnership and is anything being achieved through this. Clearly the two members attending felt the whole thing has become a little disjointed and communications was completely lacking about what is going on across the partnership.

Kelvin Allen
Chair Wensum Ecology Group.
21st June 2022